Southlands Remediation and Development Project

Environmental Assessment
Project Application (MP 06_0191)

Volume 1: Main Report

August 2009

Statement of Validity

Submission of Environmental Assessment

Prepared under Part 3A of the *Environmental Planning and Assessment Act* 1979

Environmental Assessment prepared by

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Address	URS Australia Pty Ltd Level 3 116 Miller Street NORTH SYDNEY NSW 2060
Application No.	**MP06_0191**
In respect of	

Applicant & Land Details

Applicant	Orica Australia Pty Ltd
Land to be developed	Southlands: Lot 1 DP 254392, Lot 1 DP 1078077, Lot 1 DP 85542, Lot 11 DP 109505 Springvale Drain that passes through Southlands, Unformed Public Road – Nant Street Part crossing of SWSOOS – Part Lot 1, DP 663644 New Link Road: Part Lot 2, DP 740747, Part Lot 1 873989
Project Summary	Southlands Remediation and Development Project and associated road works

Environmental Assessment

An Environmental Assessment is attached.

Declaration

I certify that I have prepared the contents of the Environmental Assessment in accordance with the requirements of the *Environmental Planning and Assessment Act* 1979 and Regulation and that, to the best of my knowledge, the information contained in this report is not false or misleading.

Signature

Name Nicole Brewer **Date** 17 August 2009

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Notes on Text

As a determination of the project will only be made after the Environmental Assessment has been on public display and submissions considered, the future conditional tense is used throughout this Environmental Assessment when describing the project, alternatives and assessing impacts. “Would” is, therefore, used throughout the text in preference to “will”.

If all approvals are given for the project to proceed, all “would” references should be interpreted as “will”, subject to final conditions of approval.

People who have followed this project over recent years will be aware that Goodman International Limited (Goodman) was involved in the project development. Orica has submitted this EA and is proceeding as sole Proponent of the development. Some references to Goodman remain in the appendices and drawings submitted with this EA. If the project is approved, and once remediation is complete, Orica intends to review sale and development options for the Southlands property in accordance with any consent granted and Goodman may be further involved.

Making a Submission

Submissions from members of the public, government agencies and interest groups are invited and sought in response to this Environmental Assessment. This submission should include:

- your name and address;
- the name and application reference number (MP 06_0191) of the proposal;
- a statement on whether you support or object to the proposal; and
- the reasons why you support or object to the proposal.

Your submission should be addressed to:

Director, Major Infrastructure Assessment
Department of Planning
GPO Box 39
SYDNEY NSW 2001

Fax: (02) 9228 6355

Under section 75H of the EP&A Act, the Director-General is required to provide copies of submissions received during the exhibition period, or a report of the issues raised in those submissions, to the Proponent and other interested public authorities. If you do not want your contact details to be made available to the Proponent or these public authorities, please state this in your submission.

Glossary

ABS	Australian Bureau of Statistics
ACM	Asbestos Containing Materials
AHC	Australian Heritage Council
AHD	Australian Height Datum - a standard reference point for the elevation of a location.
AHIMS	DECC Aboriginal Heritage Information Management System
ANZECC	Australian and New Zealand Environment Conservation Council
APM	Australian Paper Manufacturers
Aquifer	An underground geological formation that contains water and is capable of yielding water to a well or spring; a water bearing formation.
Aquitard	A low permeability unit that can store groundwater and also transmit it slowly from one aquifer to another.
Asbestos Waste	Under the current (DECC NSW, 2008) Waste Guidelines (refer definition for Waste Guidelines) Asbestos Waste is any waste that contains asbestos. Asbestos Waste is a type of Special Waste.
Attenuation	The removal or reduction of contaminants in groundwater with time and with distance travelled.
BCA	Building Code of Australia
BGC	Botany Groundwater Cleanup Project
Bioremediation	Removal of in situ organic contamination by utilising naturally occurring or specifically engineered or introduced bacteria.
BIP	Botany Industrial Park
BLEP	Botany Local Environmental Plan 1995
Block 1	The portion of the parcel of land known as Southlands located to the east of Springvale Drain.
Block 2	The portion of the parcel of land known as Southlands located to the west of Springvale Drain.
Botany Groundwater Cleanup (BGC) Project	The project to hydraulically contain and treat CHC contaminated groundwater in a Groundwater Treatment Plant (GTP) on BIP, and its associated infrastructure requirements, including groundwater extraction, effluent disposal and treated water distribution.
Botany Sands	The stratigraphical name given to unconsolidated sediments comprised predominantly of sand which underlie BIP and adjoining areas.
BTEX	BTEX is an acronym for benzene, toluene, ethylbenzene, and xylene
CoBB	Council of the City of Botany Bay
CEMP	Construction Environmental Management Plan
Central EDC Plume	Plume inferred to originate from the EDC storage tanks
CFM	Trichloromethane (Chloroform)
Chain-of-Custody	Procedure to ensure that samples are traceable from the sample collection through to laboratory analysis and reporting.
CHC	Chlorinated Hydrocarbon
Chemical Reduction	Degradation of chemicals in an oxygen deficient environment.
CLM Act	Contaminated Land Management Act 1997

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CPWE	Car Park Waste Encapsulation
CTC	Tetrachloromethane (Carbon Tetrachloride)
dBA	decibels above reference noise level
DCP	Development Control Plan
DECC	NSW Department of Environment and Climate Change (formerly known as the Department of Environment and Conservation (DEC)) and incorporating the NSW Environment Protection Authority.
Department of Environment and Conservation (DEC)	now NSW Department of Environment and Climate Change (DECC)
DEWHA	Commonwealth Department of the Environment, Water, Heritage and the Arts
DEUS	NSW Department of Energy, Utilities and Sustainability. Divisions of this department were combined with divisions of DNR to form the DWE in April 2007.
DEWR	Commonwealth Department of Employment and Workplace Relations (now known as Department of Education, Employment and Workplace Relations (DEEWR)
Discovery Cove	Discovery Cove Industrial Estate. This refers to the parts of Discovery Cove required for works within the Estate related to the Project for the New Link Road and access arrangements, associated internal re-configuration works, demolition / building services works to accommodate the New Link Road and new car parking arrangements.
Dissolved Phase	See Aqueous Phase
DNAPL	Dense Non-Aqueous Phase Liquid - an organic chemical or mixture of organic chemicals that does not readily mix with water and is heavier than water.
DNAPL Source Zones	Zones where residual or free phase DNAPL is present
DNR	NSW Department of Natural Resources. Divisions of the DNR were combined with divisions of DEUS to form the DWE in April 2007.
DoP	NSW Department of Planning
Drawdown	A lowering of the water table of an unconfined aquifer or the potentiometric surface of a confined aquifer caused by pumping from wells.
DTD	Direct Thermal Desorption
DWE	NSW Department of Water and Energy
EAR	Environmental Assessment Requirements
EC	Environmental Consultant
ECRTN	Environmental Criteria for Road Traffic Noise
EDC	1,2-Dichloroethane (Ethylene Dichloride), an intermediate compound in the production of vinyl chloride.
EHC	Environmentally Hazardous Chemicals
EMP	Environmental Management Plan
ENCM	NSW Environmental Noise Control Manual

Glossary

ENM	Excavated Natural Material is naturally occurring rock and soil (including but not limited to materials such as sandstone, shale, clay and soil) that has: - been excavated from the ground; - contains at least 98% (by weight) natural material; and - does not meet the definition of VENM. ENM does not include material that has been processed or contains acid sulphate soils or potential acid sulphate soils.
EPA	Environment Protection Authority (incorporated into the Department of Environment and Climate Change (DECC)
EP&A Act	NSW Environmental Planning and Assessment Act 1979
EP&A Regulation, EP&A Regs	Environmental Planning and Assessment Regulation 2000
EPBC	Commonwealth Environment Protection and Biodiversity Conservation Act 1999
ESA	Environmental Site Assessment
ESD	Ecologically Sustainable Development
Exclusion Zones	Areas of the Site which either require additional protective measures or may require the adoption of additional occupational health and safety requirements and work practices. The zones primarily correspond to: Areas where there is a potential for exposure to dusts or noxious vapours; and Other areas of the Site which are affected by emissions from the works being undertaken by the Remediation Contractor.
Extraction Pump	Pump associated with extraction well system.
Extraction Well	A well installed to enable in-situ groundwater remediation by the extraction of groundwater. Extraction wells assist in the control of a migrating plume.
Flow Lines	Direction of groundwater flow.
Flow Path	The direction in which groundwater is moving.
Former MCS site	Former MCS land being Part Lot 2, DP 740747, to the south of the Southlands Site, proposed to be used for a portion of the New Link Road. Formerly owned by MCS and used for container storage. Currently owned by Trust Company of Australia Limited as custodian of the TGAI1 Property Trust (a Goodman managed Trust).
Free Phase DNAPL	DNAPL saturation exceeding the capillary pressure of the soil.
FSR	Floor Space Ratio
GCP	Groundwater Clean up Plan – Plan prepared in response to Notice of Clean Up Action (NCUA).
General Solid Waste (non-putrescible)	Material classified as General Solid Waste (non-putrescible) in accordance with the DECC NSW (2008) Waste Guidelines.
General Solid Waste (putrescible)	Material classified as General Solid Waste (putrescible) in accordance with the DECC NSW (2008) Waste Guidelines.
Geology	The study of the earth as a whole, its origin, structure, composition and history, and the nature of the processes which have given rise to its present state.
Goodman	Goodman International Limited
Gradient	The rate of inclination of a slope. The degree of deviation from the horizontal.
Groundwater	Water beneath ground surface.

Glossary

Groundwater Extraction Exclusion Area (formerly Groundwater Protection Zone 1)	Area of groundwater as defined by NSW Department of Water and Energy (DWE) (formerly DIPNR), during August 2003, for which there is an exclusion on the extraction of groundwater except for remediation purposes.
GTP	Groundwater Treatment Plant - A chemical treatment plant required to be constructed for the ex situ treatment of groundwater from hydraulic containment as required by the Notice of Clean Up Action (NCUA).
Hazardous Waste	Material classified as Hazardous Waste in accordance with the DECC NSW (2008) Waste Guidelines.
HCB	Hexachlorobenzene
HCBD	Hexachlorobuta-1,3-diene
HCE	Hexachloroethane
Heavy Ends	Waste stream from solvent manufacturing, which includes HCB, HCBD and HCE.
Heggies	Heggies Australia Pty Ltd
Heritage Act	Heritage Act 1977
HHRA	Human Health Risk Assessment
HIPAP No. 4	Hazardous Industry Planning Advisory Paper No 4. Risk Criteria for Land Use Planning.
Hydraulic Conductivity	A coefficient of proportionality describing the rate at which water can move through a permeable medium.
Hydraulic Containment	Measures taken to lower the potentiometric surface and/or water table and effect hydraulic capture of the contaminant plume (as defined in the NCUA).
Hydraulic Gradient	The change in total head in an aquifer with the change in distance in a given direction.
Hydrocarbon	Organic chemicals such as benzene or tetrachloroethene that contain atoms of carbon and hydrogen.
Hydrogeology	The study of the interrelationships of geological materials and processes with water, especially groundwater.
Hydrology	The study of the occurrence, distribution and chemistry of all waters of the earth.
Inorganic	A chemical substance that does not contain carbon.
INP	NSW Industrial Noise Policy
LA10	The noise level which is exceeded for 10% of the sample period.
L_{Aeq}	The equivalent continuous sound level (L_{Aeq}) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment.
LEP	Botany Bay Local Environmental Plan
LGA	Local Government Area
Lithology	The geological (physical) character of a rock or soil.
LPG	Liquid Petroleum Gas
MCS	Maritime Container Services Pty Limited
Microgram (µg)	One thousandth part of a milligram (mg) one millionth part of a gram (g); one billionth part of a kilogram (kg).
Migration	The movement of materials (e.g. water, gas or contaminants in soil) from one location

	to another.
ML	Megalitres
Monitoring Well	A well installed to routinely observe groundwater levels or to systematically collect water samples and analyse these for chemical pollution.
MPB	Material Public Benefits
NAPL	Non-Aqueous Phase Liquid - An organic chemical or mixture of organic chemicals that does not readily mix with water.
NCUA	Notice of Clean Up Action – Notice issued by the NSW Environment Protection Authority under Section 91 of the Protection of the Environment Operations Act 1997. The notice (No. 1030236) was issued on 26 September 2003 to Orica.
NEPC	National Environment Protection Council
New Link Road Site	The site proposed for the New Link Road, being Part Lot 1 873989 (former MCS land) and Part Lot 2, DP 740747 and part crossing of SWSOOS – Part Lot 1, DP 663644.
NH&MRC	National Health and Medical Research Council
NP&W Act	National Parks and Wildlife Act 1974
NPWS as part of DECC	NSW Heritage Office and National Park and Wildlife Service
NT	National Trust
OEMP	Operation Environmental Management Plan
Organic Compound	A carbon containing compound.
Orica	Orica Australia Pty Ltd
PCA	Primary Containment Area – Block 2 Southlands
PCE	Tetrachloroethene (Perchloroethene)
PFM	Planning Focus Meeting
PHA	Preliminary Hazard Analysis
Piezometer	A well with a short slotted screen for measuring a potentiometric surface or elevation of the water table.
Plume	A mass of contaminated water extending outward from the source of the contamination.
Plume Axis	Inferred centre line of a dissolved phase groundwater contamination.
POEO Act	Protection of the Environment Operations Act 1997
Porosity	The ratio of the volume of void spaces in a rock or sediment to the total volume of the rock or sediment.
Potentiometric Surface	An imaginary surface representing the total head of groundwater and defined by the level to which water will rise in a well.
Precision	The degree to which a measurement is reproducible.
Primary Containment Area	The primary containment area is defined in the NCUA as Block 2 of Southlands.
Proponent	Orica Australia Pty Limited and its successors or assigns
Pure Phase Solubility	Aqueous solubility of a single organic compound.
RAP	Remediation Action Plan
Recharge	Replenishment of an aquifer by a natural process such as addition of water at the ground surface, or by an artificial system such as addition through a well.
REF	Review of Environmental Factors
Restricted Solid Waste	Restricted Solid Waste Material classified as Restricted Solid Waste in accordance with

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	the DECC NSW (2008) Waste Guidelines.
RTA	Roads and Traffic Authority
RVP	Remediation Validation Plan
Saturated Zone	An underground geologic formation in which the pore spaces or interstitial spaces in the formation are filled with water under pressure equal to or greater than atmospheric pressure.
SCA	Secondary Containment Area - The area defined in the NCUA as "the location where the EPA approved contaminant works upgradient of Botany Bay and Penrhyn Estuary, for the interception and containment of contaminant plumes that have migrated or may migrate beyond the primary containment area, are carried out".
Screen	Perforation in a well casing and usually located near the bottom of the well or at selected depths to tap perched aquifers.
Section A Site Audit Statement	Refer to *Site Audit Statement*
Section B Site Audit Statement	Refer to *Site Audit Statement*
Semi-volatile Compound	An organic compound which has a low potential to form a vapour at room temperature.
SEPP 33	State Environmental Planning Policy No. 33 – Hazardous and Offensive Development
SEPP 55	State Environmental Planning Policy No. 55 – Remediation of Land
SEPP 64	State Environmental Planning Policy No. 64 – Advertising and Signage
SEPP 66	The Draft State Environmental Planning Policy No. 66 – Integration of Land Use and Transport
SEPP Major Projects	State Environmental Planning Policy (SEPP) 2005 (Major Projects)
Site	The component of the Project relating to the Southlands property comprising Lot 1 in Deposited Plan (DP) 254392, Lot 1 in DP 1078077, Lot 1 in DP 85542, Lot 11 in DP 109505, Springvale that passes through Southlands, unformed Public Road – Nant Street. Referred to as the Southlands Site or the Site. Other components of the Project include the New Link Road Site and Discovery Cove and former MCS land.
Site Audit	Site auditors review the work of contaminated site consultants. The CLM Act calls these reviews 'site audits' and defines a site audit as an independent review: (a) that relates to investigation or remediation carried out (whether under the CLM Act or otherwise) in respect of the actual or possible contamination of land, and (b) that is conducted for the purpose of determining any one or more of the following matters: (i) the nature and extent of any contamination of the land (ii) the nature and extent of the investigation or remediation (iii) whether the land is suitable for any specified use or range of uses (iv) what investigation or remediation remains necessary before land is suitable for any specified use or range of uses (v) the suitability and appropriateness of a plan of remediation, a long-term management plan, a voluntary investigation proposal or a remediation proposal. The main products of a site audit are a 'site audit statement' and a 'site audit report'.

Glossary

Site Auditor	An independent third party technical reviewer (for land contamination issues) who is accredited by the DECC, NSW under the Contaminated Land Management Act 1997.
Site Audit Statement	A site audit statement is the written opinion by an accredited site auditor, on a DECC-approved form, of the essential findings of a site audit. There are two types of Site Audit Statement (Section A or Section B) that can be prepared. A Section A Site Audit Statement is used where site investigation and/or remediation has been completed and a conclusion can be drawn regarding the suitability of the land use(s). A Section B Site Audit Statement is used when the audit is completed to determine the nature and extent of contamination and/or the appropriateness of an investigation or remediation action or management plan and/or whether the site can be made suitable for a specified land use or uses subject to the successful implementation of a remedial action or management plan.
Solvay	Solvay Interox Pty Ltd
Southlands	A parcel of land bisected by Springvale Drain and lies to the west of the BIP. Orica purchased the land from Australian Paper Manufacturers (APM) in 1980. Refer to Site.
Southlands Remediation and Development Project	The Project to which this Environmental Assessment relates comprising remediation of the Southlands Site and development of an industrial / warehousing facility in stages and associated works, and New Link Road (and associated works) part of Stage 2 as described in this Environmental Assessment.
Special Waste	Special Waste is Material that is classified under the current (DECC NSW, 2008) Waste Guidelines (refer definition for Waste Guidelines) with unique regulatory requirements. Special Wastes are: clinical and related waste; asbestos waste; and waste tyres.
SSHSEP	Site Specific Health, Safety and Environment Plan
Stratigraphy	The study of rock and soil strata, especially their distribution, deposition and age.
SWC	Sydney Water Corporation
SWSOOS	South Western Sydney Ocean Outfall Sewer
TCE	Trichloroethene
TOC	Total Organic Carbon
Topography	The relief and contour of the land surface.
Transmissivity	The transmission rate of water (based on a unit width of an aquifer) relative to a hydraulic gradient.
Trip Blank	Type of field blank used to check if samples have been cross-contaminated with volatile contaminants during handling and transit between the field and laboratory. A trip spike typically comprises a sample of deionised water supplied by the laboratory in a laboratory sample bottle.
TSC	NSW Threatened Species Conservation Act 1995
Unconfined Aquifer	An aquifer whose upper level can extend to ground surface.
Unsaturated Zone	The area between ground surface and the underground water table. Interstitial spaces in this zone contain moisture (water) and air.
VC	Vinyl Chloride (Chloroethene)
VENM	Virgin Excavated Natural Material. This includes natural material (such as clay, gravel, sand, soil and rock) that is not mixed with any other type of waste and that has been excavated from areas of land that are not contaminated as a result of industrial,

Glossary

	commercial, mining or agricultural activities and that do not contain sulphidic ores or soils.
VFAs	Volatile Fatty Acids
VOC	Volatile Organic Compounds
Volatile Compound	Chemical with sufficiently low vapour pressure to become a gas at room temperature.
Waste Guidelines	DECC, NSW (2008) Waste Classification Guidelines: Part 1 Classifying Waste. During April 2008 the DEC NSW Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes (2004) were replaced by these guidelines.

Executive Summary

Introduction

Orica Australia Pty Ltd (Orica) proposes to create a new industrial estate on land known as Southlands at McPherson Street, Banksmeadow, NSW (referred to herein as the Southlands Site or the Site, refer to **Figure ES-1**) The Southlands Remediation and Development Project, known as the Project, envisages the development and use of a previously undeveloped parcel of land whilst maintaining Orica's ongoing groundwater remediation infrastructure and remediation program.

Redevelopment would allow for the continued operation and maintenance of infrastructure required for Orica's ongoing groundwater remediation works and would in no way compromise Orica's ongoing commitment to the Botany Groundwater Cleanup (BGC) Project.

The Southlands Remediation and Development Project would be delivered in stages and broadly comprises the following key components:

- Stage 1 development of the western portion of the Site fronting McPherson Street, generally between the Port Feeder Road and Springvale Drain;
- Stage 2 generally in the south eastern portion, fronting McPherson Street; and
- a future Stage 3 area in the north eastern corner of the Site.

This Environmental Assessment reviews the Project and seeks Project Approval for Stages 1 and 2 of the three staged development. It provides the Minister for Planning with the required information to determine the environmental impacts and benefits of the Southlands Remediation and Development Project. An aerial perspective of the development is presented in **Figure ES-2**. The key components are identified in **Figures 5-2** to **5-6**.

Stage 3 would be the subject of a later Project Application.

The Project seeks to make efficient and effective use of a large vacant parcel of industrial land at the heart of Sydney's major industrial and ports precinct. It proposes both soil remediation and redevelopment of the Site whilst enabling the ongoing groundwater cleanup by Orica.

Site Location and Context

The Southlands Site is a vacant portion of industrial land at the heart of Sydney's major industrial and ports precinct in close proximity to both the port and the airport. Developments immediately surrounding the Site are predominantly industrial.

Significant infrastructure associated with Orica's BGC Project is present on the Southlands Site.

The consideration of Orica's groundwater remedial obligations is paramount in both the design of the Southlands Remediation and Development Project, and the timing of its implementation. In addition to planning for Orica's ongoing groundwater cleanup works, soil and vapour remedial measures are required prior to the commencement of the industrial estate development works.

Datum: GDA94, Projection: UTM, Grid: MGA Zone 56
Map compiled using SKM Aerial Imagery, January 2005, Mapinfo StreetPro (and CadastralPlus) © 2005 and PSMA Australia Ltd.

Drawn: AJW	Approved: FINAL	Date: 13/07/07
Job No: **43217541**	File: 43217541-021.wor	

Client

ORICA AUSTRALIA PTY LTD/
GOODMAN PTY LTD

Project

SOUTHLANDS REMEDIATION AND DEVELOPMENT ENVIRONMENTAL ASSESSMENT

Title

SITE LOCATION PLAN

Figure: **ES-1**

URS

Goodman

ORICA

Legend:

Drawn: AJW	Approved: NB	Date: 02/09/2008
Job No: **43217541**	File: 43217541-022.wor	

Client

ORICA AUSTRALIA PTY LTD/
GOODMAN PTY LTD

Project

SOUTHLANDS REMEDIATION AND DEVELOPMENT ENVIRONMENTAL ASSESSMENT

Title

AERIAL PERSPECTIVE

Figure: **ES-2**

URS

design+	Southlands Remediation & Development Project McPherson Street, Botany	Part 3A Project Application	**Aerial Perspective**	NTS 12 Sep 07 VK	SRD DA015 (A)

Executive Summary

Project Need and Justification

The proposed development is envisaged to have the following benefits:

- making efficient and effective use of a large vacant parcel of industrial land at the heart of Sydney's major industrial and ports precinct;
- achieving combined remediation and development of the Southlands property to create a new industrial / warehousing estate;
- achieving a fit with Orica's more comprehensive strategy to address its historical contamination issues at, and adjacent to, the Botany Industrial Park (BIP);
- attracting a range of new users through provision of a high quality industrial / warehousing estate;
- remediating the Site and provision for the ongoing groundwater treatment by Orica, allowing Orica to meet its ongoing environmental obligations;
- providing appropriate flood mitigation to ensure that the Stage 1, 2 and 3 development does not contribute to a significant off-site impact from storm and flood waters;
- providing additional benefits in the area by improving existing traffic problems through works to Hills and Exell Street intersections with Botany Road; and
- addressing the state objective for the supply of employment land in the proximity to Sydney.

Alternatives

The Site is located within the Botany 4(a) Industrial Zone under the Botany Local Environmental Plan. In this zone a wide range of industrial uses is permissible with consent including container terminals, warehouses and distribution centres. Based on Orica's evaluation of the potential uses of the Site within the permissible use of the current zoning, it was determined that the staged creation of a new industrial estate for uses permitted under the current zoning is the most viable use of the Site.

Project Description

A summary of the main elements of the works required for each stage is provided below and is shown in **Figures 1-1** and **5-4**.

It is intended that Orica will undertake a staged delivery of the site initially carrying out remediation and civil works to deliver the land suitable for the new warehouse/ industrial buildings. Construction of the new buildings may then be undertaken by others in accordance with the plans shown in this Application. The Stages of work are therefore seen as follows:

- Stage 1
  - earthworks, works to address the Remediation Action Plan (RAP) and filling to new finished levels for Stage 1 (western side of the Site);
  - staged development of new warehouse and office space, hard stand areas, car parking and landscaping areas and extension of necessary municipal services as required;

  - construction of a new private entry road from McPherson Street (east of, and adjacent to Nant Street) providing access to Stage 1;
  - earthworks, and erosion and sediment controls for Stage 2 (south eastern portion of the Site) to create levels to satisfy the flood management strategy and create floodplain storage;
  - works to Hills and Exell Street intersections with Botany Road in accordance with preliminary plans, to be agreed with City of Botany Bay Council (CoBB);
  - creation of easements within the Site to provide for existing and potential future groundwater remediation infrastructure; and
  - staged subdivision of the Site, former MCS land parcel and Discovery Cove in order to facilitate the proposed development. Subdivision will take place at each stage to suit that stage of works as per the attached subdivision plan.

- Stage 2 (subject to acquisition of land rights)
  - earthworks to suit required flood design levels;
  - development of the south eastern side of the Site (east of the unformed Nant Street) for warehouses and office buildings;
  - access road connecting the Southlands Site with Botany Road (New Link Road) and necessary reconfiguration of Discovery Cove Estate; and
  - incorporation of required drainage infrastructure in tandem with the New Link Road to solve flooding problems in the local catchment and therefore allow the development of Stage 2 and ultimately Stage 3.

Planning and Legislative Requirements

The analysis of the consistency of the Project with the relevant statutory provisions confirms that:

- the proposal is permissible with consent within the 4(a) industrial zone of the Botany Local Environmental Plan 1995;
- the proposal is consistent with the objectives and initiatives for the economy and employment in the NSW Government's Metropolitan Strategy for Sydney;
- the Project has been declared as a Part 3A Project by the Minister for Planning under the relevant provisions of State Environmental Planning Policy (Major Projects) 2005;
- the Minister for Planning's approval is required for this Project; and
- the Director-General of Planning has issued requirements for this Environmental Assessment.

Consultation

Orica recognises the importance of stakeholder consultation during the project planning phase and has attempted to consult widely with a range of stakeholders during preparation of this Environmental Assessment. In accordance with the Environmental Assessment Requirements, consultation for the project

has targeted government and community stakeholders via written communications, targeted meetings, a Project webpage and public meetings.

Orica intends to maintain regular contact with the regulatory authorities, industrial neighbours, the local community and other interested parties during the assessment of the proposal.

Orica would prepare and implement a Communications Plan as part of the Construction Environmental Management Plan (CEMP) addressing the remediation (in accordance with the Southlands RAP) and construction phase of the Project.

Hydrology and Flooding

The Southlands Site, as the last large undeveloped site in the lower catchment, currently operates as a defacto flood storage area for other developed areas despite its current industrial zoning. Modelling undertaken as part of the investigations for the redevelopment predicted no significant adverse impacts on flood levels either upstream or downstream of the Southlands Site as a result of the Stage 1 and 2 works providing the following works are incorporated into the development:

- Stage 1:
  - fill Stage 1 area to the required site levels; and
  - conduct earthworks in the south eastern portion of the Site (being the future Stage 2 area) to create necessary levels to satisfy the flood management strategy and create compensatory floodplain storage.
- Stage 2 and New Link Road:
  - incorporate drainage infrastructure in tandem with the New Link Road to solve flooding problems in the local catchment and therefore allow the development of Stages 2 and 3; and
  - further detailed design and resolution of issues with Sydney Water and other stakeholders for the New Link Road crossing of the Sydney Water South Western Sydney Ocean Outfall Sewer (SWSOOS).

Measures to address stormwater runoff quality would be incorporated into the design and operation of Stages 1 and 2.

Human Health Risk Assessment

A quantitative Human Health Risk Assessment (HHRA) has been prepared by URS for the Southlands Site. The process followed for the completion of the HHRA was an iterative approach. The available Site data and the general development proposal was considered initially in a Preliminary HHRA. The outcome of these investigations and discussions and identified risk management measures were then incorporated into the Remediation Action Plan (RAP). The risk management measures proposed were then further considered in the completion of the HHRA.

The HHRA forms a reference document for development of the Southlands RAP and this Environmental Assessment. The HHRA provides a detailed assessment of risks to human health based on the proposed development. The HHRA provided input into the RAP to enable key issues relevant to the remediation of the Site to be adequately identified and addressed as required.

Executive Summary

The assessment of potential risks to human health on the Southlands Site is complex. Soil, sediment, water and air data collected from the Southlands Site have been used in the assessment presented. However as the HHRA is based on a proposed development, where there is uncertainty or data gaps with respect to areas / information that define potential exposures on the Site, a conservative approach has been adopted.

On the basis of the HHRA undertaken, providing the risk management measures identified and detailed in the Southlands RAP are implemented and verified (where required), long-term risks to workers and visitors to the proposed Stage 1 and 2 development of the Site are considered to be acceptable.

Soils, Geology and Contamination

An RAP was developed for the Southlands Site in response to the findings of the risk assessment. The Southlands RAP provides a remedial approach for the Southlands Site that would render it suitable for the proposed land use. A NSW Department of Environment and Climate Change (DECC) accredited Site Auditor has confirmed that the Site can be made suitable for the proposed development if the Site is remediated in accordance with the Southlands RAP and the conditions outlined in the Section B Site Audit Statement. The Site Auditor has confirmed that implementation of the Southlands RAP is feasible.

Orica's Ongoing Groundwater Cleanup

The consideration of Orica's groundwater remedial obligations is paramount in the Project. The proposed remediation and development of the Southlands Site has been planned and is proposed to be staged in a manner that will allow Orica to meets its ongoing environmental obligations. Orica's obligations with respect to the Site include maintaining the groundwater cleanup throughout and following implementation of the Project in accordance with the terms of the Notice of Clean Up Action (NCUA) and other regulatory requirements.

Air Quality

Dust emissions would be managed during remediation and construction through the preparation and implementation of a Construction Environmental Management Plan (CEMP). The potential for inhalation of volatile chemicals in outdoor air (emissions from subsurface soil and groundwater) and asbestos during construction would also be managed through implementation of a CEMP and Site Specific Health Safety and Environment Plan (SSHSEP).

Inhalation of volatile chemicals associated with emissions to air from Springvale Drain would be addressed through implementation of a shallow groundwater extraction system. The system is being developed by Orica and approvals are being sought separately to this Application. Verification of this system would be required prior to occupation of the Site.

The inhalation pathway for volatile chemicals within buildings would be addressed through the detailed design of vapour intrusion mitigation measures for site structures.

The inhalation pathway for volatile chemicals from the compensatory flood storage area would be addressed through detailed design of a system to prevent shallow groundwater discharge at the surface.

Air emissions from operation of the industrial warehousing facility are likely to be very low and would not have an adverse affect on local or regional air quality. The design of the proposed facility would be consistent with the NSW Government "Action for Air" strategy for Sydney developed to manage air quality in Sydney. This strategy includes the control of fugitive emissions, use of alternative fuels and landscaping.

Executive Summary

The location of dust sensitive industries within the development including potential food processing, pharmaceutical and electronic industries amongst others, would need to be considered.

Traffic and Transport

The traffic generation arising from Stage 1 of the Project can be accommodated by the existing road network subject to the improvements proposed as part of the Project at the intersections of Hills Street and Exell Street with Botany Road.

An assessment of the traffic impacts from all three stages of the proposed development found that a new access road (New Link Road) connecting the Southlands Site with Botany Road at the existing left-in/left-out access to Discovery Cove was the preferred solution based on predicted traffic conditions in 2016. The New Link Road would be constructed as part of the Stage 2 development.

Noise and Vibration

During construction and operation the Project would comply with the NSW DECC's Industrial Noise Policy (INP) noise goals at all assessed residential, school and commercial / industrial receivers during the day, evening and night time periods without the need for any noise mitigation.

Traffic generated by the Southlands development during operation would create a negligible increase in traffic noise levels which would not be noticed by the closest residents which are located along or near Botany Road and was concluded to meet all relevant criteria set within the Environmental Criteria for Road Traffic Noise (ECRTN). The impact of noise from construction traffic would be less than that during operation.

The vibration levels associated with operation and construction would be well below the guideline vibration levels set for all residential and school receivers.

Flora and Fauna

The ecological and conservation value of the Southlands Site is low, with no remnant vegetation, low native species diversity and an abundance of noxious weeds. The Site provides only marginal habitat for local fauna species.

No species listed under the *Threatened Species Conservation Act 1995* or *Environment Protection and Biodiversity Conservation Act 1999* were recorded during field surveys conducted for this Project, however some species, such as migratory waterbirds, could utilise foraging habitat on the Site opportunistically on a temporary basis though the assessment concluded that the Project would not have a significant impact on these species.

Although no individuals of the Green and Golden Bell Frog were recorded on the Site, it was recommended that two small habitat ponds be constructed as part of the proposal to ensure that potential habitat for this frog is maintained on the Site. These have been incorporated into the proposed development.

Due to extensive industrial use, Discovery Cove contains little native vegetation or potential habitats for threatened species. There is some limited vegetation along Springvale Drain within the former Maritime Container Services (MCS) land proposed for the New Link Road.

Executive Summary

Flows through Springvale Drain to Penrhyn Estuary for Stage 1 would match the existing regime. Detailed design of Stage 2 drainage infrastructure would incorporate measures to mitigate potential scouring and sediment impacts at Penrhyn Estuary.

A CEMP for the Site would contain appropriate safeguards to ensure that the proposed development does not result in downstream water quality impacts on sensitive receptors including Penrhyn Estuary during construction.

Heritage

Impacts on Aboriginal or non-Indigenous heritage items by the development of the Southlands Site are unlikely. However, a CEMP would be developed and implemented to provide an appropriate protocol for addressing any unforseen heritage issues should they arise.

Socio Economic

The economic impact would result from capital expenditure in the order of $130 million in direct construction costs, 310 new jobs during construction of the facility and the creation of approximately 760 new jobs during operation. The Project would have the added benefits of achieving remediation of the Site and development of the Site to create a new industrial estate through business investment.

Land Use Safety Planning

The assessment of land use safety concluded that the Site is not a potentially hazardous or offensive development and a Preliminary Hazard Analysis was not required. The proposed use of the Southlands Site meets the Land Use Planning requirements of the Director-General described in the Environmental Assessment Requirements.

There are no significant off-site risks imposed by this Site on the neighbouring sites and the transport of Dangerous Goods would be minimal and does not present a significant transport risk.

The existing land uses around the Site impose risk on the operations of the Southlands Site although the risks do not extend significantly into the Site. The area of risk encompasses a small area of the future Stage 3 and can be appropriately mitigated by the design and orientation of the proposed warehouse buildings.

The proposed use of the Southlands Site is consistent with the recommendations of the Port Botany Land Use Safety Study and the Botany / Randwick Industrial Area Study, and the assessment concluded that the proposed development does not impose significant risk on the neighbouring properties and also maintains the buffer between the adjacent higher risk operations on Botany Industrial Park (BIP) and local residences.

Waste Management

A Waste Management Plan would be developed prior to the construction and operation and incorporated into the CEMP and OEMP of the Project to maximise the reduction, recycling and reuse of waste materials.

Waste generated during remediation would include removal and off-site disposal of impacted soils, vegetation and oversize materials from stockpiles. Some HCB impacted waste would be required to be removed from the Site, and Orica may consider treatment using the Directly-heated Thermal Desorption plant proposed for establishment on the BIP (currently subject to assessment by DoP). Where required, waste assessment and classification during the works would be undertaken in accordance with the *Waste Guidelines* (NSW DECC, 2008).

Executive Summary

The amount of waste predicted to be generated during the construction of the warehousing facility is relatively small. Some waste material would be generated as a consequence of construction activities on Site. In addition construction of the New Link Road would require demolition of the road pavements in MCS / Discovery Cove and some buildings within Discovery Cove.

The CEMP would include provisions for water management to address issues around the potential for wastewater to be generated during construction if shallow groundwater is intercepted during earthworks.

Wastewater generated during operation would be managed by connecting all ablutions to the sewer system and where appropriate by obtaining Trade Waste Agreements from Sydney Water.

Landscape and Visual Impact

The proposed landscape design addresses the Site with particular attention to creating an attractive street frontage and a landscaped setting for the industrial park on a staged basis. Attention has also been given to the surrounding heavy industrial context, the staged nature of the Project. Initial planting works in Stage 1 would screen views of the Stage 2 and 3 development areas and subsequently screen Stage 3 when Stage 2 is built.

The landscape design for the Site addresses the requirements of the relevant CoBB Development Control Plans (DCP) and provides an attractive feature to this industrial/commercial development.

Water and Energy Efficiency

The measures adopted for the Project have been assessed against the Botany Energy Efficiency DCP. The assessment demonstrates that the proposal would realise appropriate energy and water efficiency achievements over the life of the development.

Draft Statement of Commitments

This Environmental Assessment details the Draft Statement of Commitments in accordance with section 75F (6) of the EP&A Act. The inclusion of appropriate environmental management measures into the detailed design and construction of the Project would minimise adverse impacts on the environment. The proposed adoption of the relevant measures identified in the Draft Statement of Commitments into a CEMP and Operation Environmental Management Plan (OEMP) would be an important component of the proposal and reiterate the commitment of the Proponent and their contractors to mitigate the environmental impacts identified in this assessment.

Conclusion

The Project Application by Orica to create a new industrial estate on land known as Southlands at McPherson Street, Banksmeadow, NSW has been submitted to the Minister for Planning pursuant to the provisions of Part 3A of the NSW Environmental Planning and Assessment Act 1979 (EP&A Act) for approval.

This Environmental Assessment, prepared in accordance with the requirements of the Director-General, has identified a range of potential environmental impacts. It is considered that these impacts can be satisfactorily mitigated by implementing the measures recommended in this report. A number of commitments have been made to ensure the physical, social and economic environment would not be adversely affected.

Executive Summary

It is recommended that the Minister approve the Stage 1 and Stage 2 of the Southlands Remediation and Development Project as submitted.

Introduction Chapter 1

1.1 Background

Orica Australia Pty Ltd (Orica) proposes to create a new industrial estate on land known as "Southlands", at McPherson Street, Banksmeadow, NSW (referred to as the Southlands Site or the Site, refer to **Figure 1-1**). The project, known as the Southlands Remediation and Development Project (Project), envisages the reuse of a previously undeveloped and contaminated site for a major new industrial / warehousing estate, whilst maintaining Orica's ongoing groundwater remediation infrastructure.

With the exception of groundwater extraction wells, monitoring wells and associated pipe work that have been established by Orica to meet their ongoing groundwater remediation obligations, the Site is currently vacant. Block 1 (the eastern side of the Site, and to lesser extent Block 2 the western side of the Site) is underlain by contaminated groundwater plumes that are the subject of a current NSW Department of Environment and Climate Change (DECC, formerly known as Department of Environment and Conservation) Notice of Clean Up Action (NCUA)[1].

The consideration of Orica's groundwater remedial obligations is paramount in both the design of the redevelopment of the whole Site, and the timing of its implementation. In addition to groundwater contamination issues, soil and vapour remedial measures are also required prior to the commencement of the industrial estate development works.

The future use of the land would incorporate all necessary infrastructure required for Orica's ongoing groundwater remediation works and would in no way compromise Orica's ongoing commitment to the Botany Groundwater Clean Up (BGC) Project.

People who have followed this project over recent years will be aware that Goodman International Limited (Goodman) was involved in the project development. Orica has submitted this EA and is proceeding as sole Proponent of the development. Some references to Goodman remain in the appendices and drawings submitted with this EA. If the project is approved, and once remediation is complete, Orica intends to review sale and development options for the Southlands property in accordance with any consent granted and Goodman may be further involved.

1.2 Project Outline

The Southlands Site is an approximate 18.3 hectare (ha) site owned by Orica and is situated entirely within the City of Botany Bay Council (CoBB) Local Government Area. The Project comprises the following key stages:

- **Stage 1 –** development of the western portion of the Site generally between Floodvale and Springvale Drains (previously referred to as Block 2) with associated works to the east of Springvale Drain (including a new road- access from McPherson Street, minor civil works to provide flood storage capacity and landscaping works) and local traffic improvements at the intersections of Hills and Exell Streets with Botany Road;

[1] At the time of writing the regulation of the groundwater cleanup is under review and DECC has recommended that the NCUA be replaced with a Voluntary Management Proposal (VMP). Orica is drafting a VMP for review by DECC.

Chapter 1 Introduction

- **Stage 2 –** development of the south eastern portion of the Site (part of the area previously referred to as Block 1) and creation of a New Link Road from Botany Road to the Southlands Site through Goodman's Discovery Cove Estate and adjoining the former Maritime Container Services site (former MCS site), and associated internal reconfiguration of Goodman's Discovery Cove Estate and the former MCS site (this stage is subject to acquisition of land rights); and
- **Stage 3 –** the Stage 3 portion of the Site would be the subject of a separate Project Application at a later date. Development the north eastern portion of the Site (part of the area previously referred to as Block 1).

The development of each portion of the Site involves two primary phases, as follows:

- staged remediation and earthworks sufficient to make the Site suitable for redevelopment and importantly the issuance of a Section A Site Audit Statement confirming that the Site is fit for commercial and industrial land use; and
- the subsequent staged construction of new buildings in accordance with any conditions cited in the Section A Site Audit Statement and the Project Approval may then be undertaken by others.

Legend:

- PROPOSED DEVELOPMENT
- SPRINGVALE DRAIN
- FLOODVALE DRAIN

0 200 400m

Meters

Datum: GDA94, Projection: UTM, Grid: MGA Zone 56
Map compiled using SKM Aerial Imagery, January 2005, Mapinfo StreetPro (and CadastralPlus) © 2005 and PSMA Australia Ltd.

Drawn: AJW	Approved: FINAL	Date: 13/07/07
Job No: **43217541**	File: 43217541-007.wor	

Client

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Project

SOUTHLANDS REMEDIATION AND DEVELOPMENT ENVIRONMENTAL ASSESSMENT

Title

SITE LOCATION PLAN

Figure: **1-1**

URS

Chapter 1 Introduction

Table 1-1 summarises the scope of the approvals being sought in this Application.

Table 1-1 Summary of Approvals Being Sought

Component	Approval (Stage 1)	Approval (Stage 2)	Report Reference
Stage 1 Bulk earthworks and soil remediation.	✓		Collectively referred to as Stage 1
Stage 1 Development of warehouse and offices.	✓		
Extension of necessary services to Stage 1.	✓		
Construction of a new private entry road from McPherson Street to suit Stage 1 of the development.	✓		
Earthworks and soil remediation over the Stage 2 portion of the development to suit new flood compensation area for the local catchment during Stage 1 development.	✓		
Works to Hills and Exell Street intersections with Botany Road to suit Stage 1 traffic needs.	✓		
Fencing of Stages 2 and 3 during Stage 1.	✓		
Creation of easements across the whole of the Southlands Site to provide for ongoing and future groundwater infrastructure, as well as potential new groundwater remediation technologies.	✓		
Staged Subdivision of Southlands Site, former MCS land, and Discovery Cove to accommodate the proposed development. Subdivision will take place at each stage of works to suit that stage.		✓	
Additional Stage 2 earthworks and filling as necessary.		✓	Collectively referred to as Stage 2
Stage 2 Development of warehouse and offices.		✓	
Construction of a New Link Road to Botany Road in Stage 2 with accompanying drainage infrastructure addressing flooding on Stage 2 and 3 areas.		✓	Collectively referred to as New Link Road and part of Stage 2
Reconfiguration of Discovery Cove Estate to provide for New Link Road.		✓	
Stage 3 Bulk Earthworks.			Collectively referred to as Stage 3 *(Stage 3 does not form part of this Application and will be subject to a later Project Application)*
Stage 3 Development of warehouse and offices.			

1.3 Project Objectives

The Project has the following objectives:

- make efficient and effective use of a large vacant parcel of industrial land at the heart of Sydney's major industrial and ports precinct;
- achieve combined remediation and development of the Southlands Site to create a new industrial / warehousing estate;

- achieve a fit with Orica's more comprehensive overall strategy to address its historical groundwater contamination issues at, and adjacent to, the Botany Industrial Park (BIP);
- attract a range of new users through provision of a high quality industrial / warehousing estate;
- provide for the ongoing groundwater extraction at the Southlands Site by Orica and allow Orica to meets its ongoing environmental obligations;
- provide additional benefits in the area by improving existing traffic problems through works to the Hills and Exell Street intersections with Botany Road;
- provide appropriate flood mitigation to ensure that the Stage 1, 2 and 3 of the development does not contribute to a significant off-site impact from storm and flood waters; and
- address the State objective for the supply of employment land in the proximity to the City.

1.4 The Proponent

Orica is the Proponent.

From 1942 until 1998, ICI Australia Limited manufactured a wide range of chemicals on the Botany site now known as BIP. In 1997, ICI plc sold its holding in ICI Australia, which was renamed Orica.

Orica is the registered proprietor of Block 1 and Block 2 of Southlands.

Today, Orica supplies and manufactures industrial specialty chemicals, agricultural chemicals and fertilisers, explosives and mining chemicals, and plastics and paints. As an independent company, Orica has approximately 40 major operating sites in 14 different countries. Within NSW, Orica operates three major sites at Botany, Padstow and Newcastle (Kooragang Island).

1.5 Environmental Assessment Process

In New South Wales the *Environmental Planning and Assessment Act 1979* (EP&A Act), and its supporting regulation, the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation), provide the framework for development and environmental assessment. Part 3A in the EP&A Act relates to a category of development known as "Major Projects". *State Environmental Planning Policy (Major Projects) 2005* (Major Projects SEPP) defines categories of development which are identified as projects to which Part 3A of the EP&A Act applies.

1.5.1 Major Projects

The Major Projects SEPP identifies projects of State or regional planning significance where the approval and assessment process under Part 3A of the EP&A Act should apply.

Clause 12 within the Group 4 class of development listed in Schedule 1 of the Major Projects SEPP declares that development for the purpose of container storage facilities, or storage or distribution centres, with a capital investment value of more than $30 million are Part 3A projects.

A Major Project application was submitted to the Department of Planning (DoP) on 7 July 2006, including a supporting Preliminary Environmental Assessment, requesting that the Southlands Remediation and Development Project be assessed under the provisions of Part 3A. The Director-General's Environmental Assessment Requirements for the project were issued on the 8 September 2006 pursuant to section 75F(2) of the Act (refer to **Appendix A**).

Chapter 1 Introduction

1.5.2 Planning Focus Meeting

A Planning Focus Meeting (PFM) was held on 4 August 2006 and included an inspection of the Site. The PFM was attended by representatives of DoP, Department of Environment and Climate Change (DECC), Department of Health (DoH), City of Botany Bay Council (CoBB) and the Roads and Traffic Authority (RTA).

The PFM provided an initial forum for discussion and consideration of issues to be addressed by the Proponent in the Project Application. These issues, and further matters which were raised in subsequent specific meetings and project briefings, are summarised in **Chapter 7**.

1.6 Environmental Assessment Preparation and Exhibition

This Environmental Assessment has been prepared in accordance with Part 3A of the EP&A Act and the Director-General's Environmental Assessment Requirements.

The objectives of this Environmental Assessment are:

- to comply with the requirements of the EP&A Act, as formalised in the Director-General's Environmental Assessment Requirements;
- to support a project application seeking approval for Stages 1 and 2 of the Southlands Remediation and Development Project;
- to provide the Minister for Planning with sufficient information to determine the environmental impacts and benefits of the Southlands Remediation and Development Project; and
- to inform the community about the Southlands Remediation and Development Project.

1.6.1 Key Assessment Requirements

The Director-General's Environmental Assessment Requirements (refer to **Appendix A**) identified specific issues to be addressed in the Environmental Assessment. These included a review and assessment of:

- the scope and timing of the proposal;
- remediation criteria and Remediation Action Plan (RAP);
- strategic planning and regulatory interaction;
- human health impacts;
- traffic and transport impacts;
- noise and vibration impacts;
- ecological impacts; and
- land use safety planning implications.

These key issues have been addressed with specific investigations that were completed by specialists for which separate reports have been developed. These investigations were used as source materials for this Environmental Assessment and are submitted as components of this Environmental Assessment. Where

these investigations are very detailed they are presented in **Volume 2 Appendices** and summaries provided in the relevant sections of this main report. In other instances the whole assessment forms the relevant section of this main report.

1.6.2 General Environmental Risk

The Director-General's Environmental Assessment Requirements state that the Environmental Assessment must consider environmental risks that may lead to potential environmental impacts associated with the Project. Further to the issues listed in **Section 1.6.1**, additional issues that were considered relevant to this Project include:

- hydrology and flooding;
- soils, geology and groundwater;
- socio economic;
- air quality;
- heritage;
- waste management;
- landscape and visual; and
- water and energy efficiency.

1.7 Document Structure

This Environmental Assessment document is divided into ten parts. The content of each part is outlined below:

- *Executive Summary* – This part provides a brief description of the key issues and findings detailed in the other parts of the Environmental Assessment.
- *Project Background* – **Chapters 1** and **2** briefly outline the environmental impact assessment process and describe the background and context to the project and provide an outline of the proposed Southlands Remediation and Development Project.
- *The Project* – **Chapters 3** to **5** detail the needs, objectives and alternatives of the project and provide a detailed description of the proposed Southlands Remediation and Development Project.
- *Planning and Legislative Requirements* – **Chapter 6** includes the relevant controlling Commonwealth and State legislation, and nominates the various licences and approvals required to enable the proposed Southlands Remediation and Development Project to proceed.
- *Consultation* – **Chapter 7** summarises the issues raised during consultation with statutory and other relevant authorities, and the local community.
- *Environmental Assessment* – **Chapters 8** to **20** provide an overview of the existing environment, an assessment of the likely impacts of the proposal and the identification of appropriate mitigation measures to safeguard the environment.
- *Draft Statement of Commitments* – **Chapter 21** outlines the Proponent's commitment to proposed environmental management measures to safeguard against potential impacts, and ongoing monitoring.
- *Conclusion* – **Chapter 22** addresses the principles of Ecologically Sustainable Development (ESD) and provides justification for the proposed Southlands Remediation and Development Project.

Chapter 1 Introduction

- *References* – **Chapter 23** provides a list of materials referenced during the preparation of the Environmental Assessment.
- *Appendices* – This part contains the correspondence received and the detailed assessments conducted by specialist consultants for the Environmental Assessment.

2.1 General Site Description

2.1.1 Description of Development Site

The Southlands Remediation and Development Project affects the following properties as shown on **Figure 2-1**:

- the Southlands property;
- the Springvale Drain Corridor;
- the former MCS container terminal on the southern side of McPherson Street;
- a crossing of the Sydney Water South Western Sydney Ocean Outfall Sewer (SWSOOS); and
- Goodman's Discovery Cove Estate.

The Nant Street Corridor is a public road that would be added to the Site subject to the issuance of owners' consent from Botany Bay City Council and / or sale of the road. Otherwise the public road corridor will remain.

Title information for these sites is shown in **Table 2-1.**

Table 2-1 Summary of titles covered by Development Site

Land Description	Area (m^2) (all subject to survey)	Current Use	Landowner
Southlands			
Lot 1 in Deposited Plan (DP) 254392	2,850	Vacant Land / BGC Project infrastructure	Orica Limited
Lot 1 in DP 1078077	95,300	Vacant Land / BGC Project infrastructure	Orica Limited
Lot 1 in DP 85542	61,300	Vacant Land / BGC Project infrastructure	Orica Limited
Lot 11 in DP 109505	23,430	Vacant Land / BGC Project infrastructure	Orica Limited
Sub Total – Orica Owned Lands	**182,880 m^2**		
Springvale Drain that passes through Southlands	2,890	Springvale Drain	Crown land
Unformed Public Road – Nant Street	3,470	Unformed Public Road with a series of Pipeline Agreements within corridor	Botany Bay City Council (inclusion subject to Council owners consent and or sale of the land)
Sub Total	**189,240 m^2**		
Sydney Water – SWSOOS Crossing			
Part crossing of SWSOOS – Part Lot 1, DP 663644	Approx 270	SWSOOS	Sydney Water

Chapter 2 Site Location and Context

Land Description	Area (m^2) (all subject to survey)	Current Use	Landowner
New Link Road			
Part Lot 2, DP 740747	3,330	New Toll facility under construction (formerly MCS Container Storage) on land to the south of the Southlands Site, proposed to be used for New Link Road.	Trust Company of Australia Limited as custodian of the TGAI1 Property Trust (a Goodman managed Trust).
Part Lot 1 873989	75,680 (Total Estate)	Discovery Cove Industrial Estate – parts of Discovery Cove required for works within the Estate related to the Project for the New Link Road and access arrangements, associated internal re-configuration works, demolition / building services works to accommodate the New Link Road and new car parking arrangements.	Trust Company of Australia Limited as custodian for Goodman Industrial Trust.

2.1.2 Southlands Site

Southlands is an approximate 18.3 hectare (ha) site owned by Orica. It is located in Banksmeadow, approximately 500 metres (m) north of the northern shores of Botany Bay. The Site has frontage on McPherson Street. Southlands is generally divided into two blocks, (known as Block 1 – eastern portion and Block 2 – western portion), by Springvale Drain which is Crown land, a north-south trending man-made drainage feature and surface water conduit. Floodvale Drain, a similar drainage feature, sits beyond the western boundary of Block 2 Southlands adjacent to the Port Feeder Road (refer to **Figure 2-1**).

With the exception of groundwater extraction wells, monitoring wells and associated pipe work (that has been established by Orica to meet it's ongoing groundwater remediation obligations), the Site is currently vacant.

Developments immediately surrounding the Site are predominantly industrial. There are residential developments situated at some distance to the west and the east of the Site (refer to **Figure 2-2**).

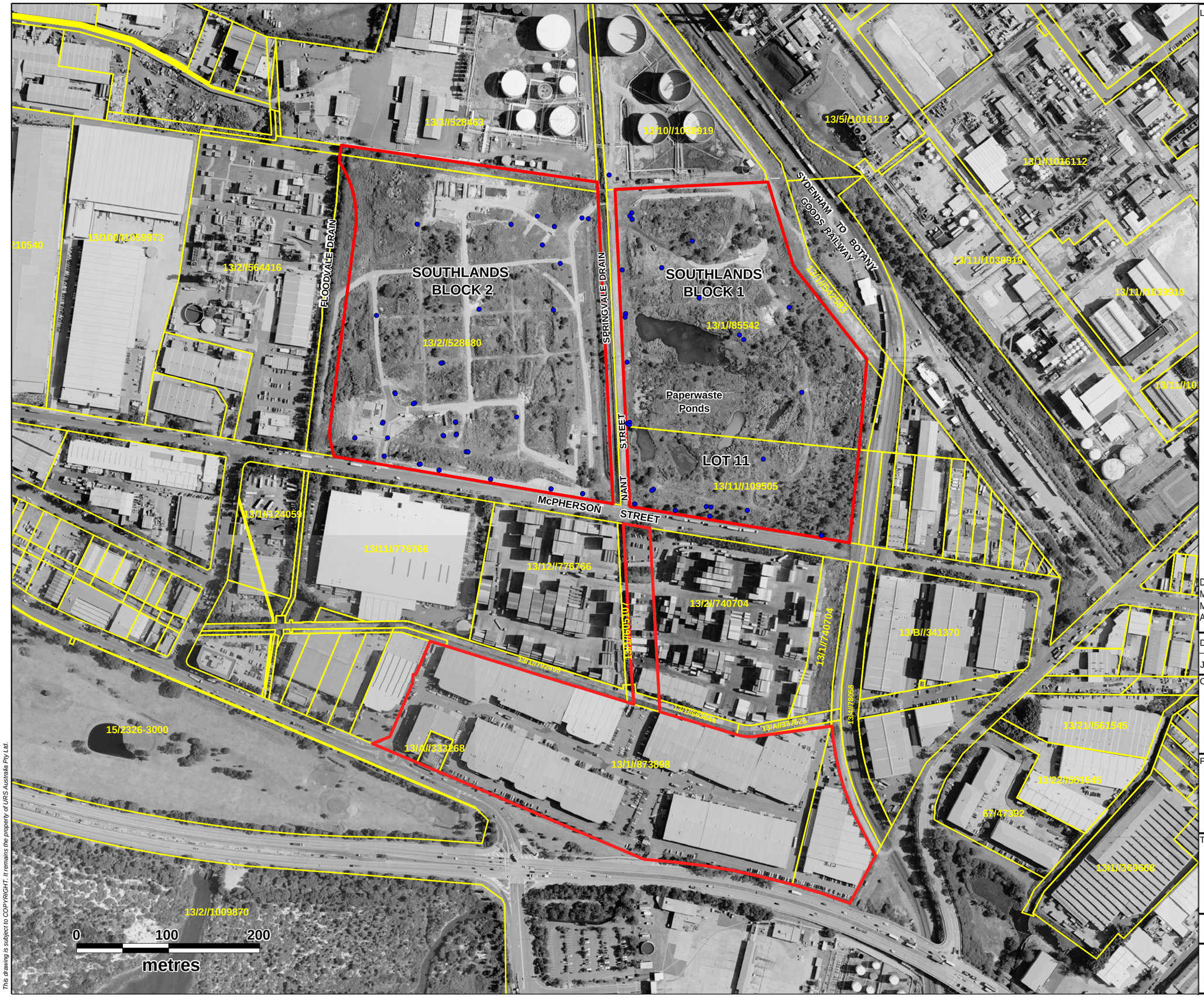
Nant Street is an unsealed roadway that runs though the middle of the Site that provides access from the McPherson Street site entrance to the Qenos Pty Ltd Tank Farm, located to the north of Southlands.

Various infrastructure, including above ground pipelines and groundwater extraction wells, which form the Primary Containment Area (PCA) for the Botany Groundwater Cleanup Project (BGC Project), are located on Southlands, principally along the McPherson Street boundary (extraction wells) and the western margin of Springvale Drain (above ground pipelines). The PCA extracts groundwater, which is pumped via pipelines to the Groundwater Treatment Plant (GTP) located at the BIP, situated to the north east of Southlands.

The Southlands Site occupies a portion of a region once known as Veterans Swamp, part of the Botany Swamps. During the historic draining of the swamp peat lenses were exposed and in several parts of the Botany Swamps (including the Veterans swamp) peat cutting was carried out on a commercial basis. The Paper Waste Pond on Block 2 (western portion of the Site) is a remnant from the days of peat extraction. During the 1850s Springvale and Floodvale Drains were excavated. These drains were extended over

time and eventually reached their present 3 km lengths by the early 1860s. These drains have remained in operation ever since.

There are five former peat mining excavations on Southlands Block 1, which are thought to be periodically charged by both surface and groundwater. It is understood these features, generally referred to as the *Paper Waste Ponds*, are remnants of historical sand and peat mining activities, which during a period of ownership by Australian Paper Manufacturers (APM), were partially backfilled with paper waste from the manufacturing processes. It is understood that APM discharged paper waste slurries into some of the ponds and pits that existed in this area, which were formed in the early 1960s by the extraction of peat and sand. APM is believed to have used mercury-based fungicides in their manufacturing process. Prior to this the Site was used as a dumping area for boiler ash from the nearby Bunnerong Power Station. This boiler ash was used to fill in Southlands and adjoining lands.



Legend:

- Proposed Development Area
- Cadastral Boundaries
- Bundle Piezometer/ Groundwater Monitoring Well

Datum: GDA94, Projection: UTM, Grid: MGA Zone 56
Map compiled using SKM Aerial Imagery, January 2005, Mapinfo StreetPro (and CadastralPlus) © 2005 and PSMA Australia Ltd.

Drawn: AJW	Approved: NB	Date: 28/04/2008
Job No: **43217541**	File: 43217541-008.wor	

Client

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Project

SOUTHLANDS REMEDIATION AND DEVELOPMENT ENVIRONMENTAL ASSESSMENT

Title

PROPOSED DEVELOPMENT AREA

Figure: **2-1**

URS

ICI Australia Limited, then a subsidiary of ICI plc of the UK, purchased the Site in 1980, intending to develop it as part of the expanding chemical plant at Matraville. A variety of other solid wastes and building rubble have been disposed of on Southlands by local industry and others during this period, until the Site was fenced by ICI in 1991. The dumped materials generally comprise demolition wastes and rubble. Subsequent investigations have indicated these materials contain asbestos containing materials (ACM). The thickness of this fill is variable ranging between 0.75 m and 2.5 m across the Site, but is up to 4 m in areas. As a result of historical activities, the surface of the Site is uneven, with scattered pond areas and is moderately vegetated with low shrubs and weeds. Since cessation of dumping, the various stockpiles have become heavily vegetated and overgrown. As a result, the surface of Southlands Block 2, and to a lesser extent Block 1, has a characteristic "hummocky" topography.

A grid based series of tracks has been cut into the dense vegetation, originally to facilitate a geotechnical survey in the late 1990's but they now serve to enable access for installation and maintenance of infrastructure for the GTP maintenance and associated environmental monitoring activities.

2.1.3 New Link Road Site

Former MCS Land

The former MCS land located to the south of the Southlands Site was previously used for container storage. It has recently been purchased by a Goodman-managed Trust and is being redeveloped for a new warehousing and distribution facility for Toll Logistics. Springvale Drain continues south from the Southlands Site through this site and is predominantly open.

Discovery Cove

The Discovery Cove development includes four large warehouse buildings. These are divided into 21 units. The area between the warehouses includes access routes, car parking and landscaping. Springvale Drain continues through the Site and is fully piped.

2.1.4 The Nant Street Corridor

The unformed public road known as Nant Street is currently owned by the CoBB. CoBB has advised that it would consider the sale of the Nant Street strip. To effect the sale, the road would be required to be formally closed. CoBB has advised that it is progressing the required statutory steps to achieve the closure. An initial resolution of Council has been passed to this effect. Following the necessary statutory steps the unformed road corridor would then be offered for sale to the adjoining landowner, namely, Orica. Access to the Qenos tank farm to the north of the Site would be maintained, regardless, either by the Nant Street corridor or a new Right of Way.

Inclusion of the Nant Street corridor in the development site would require either Council's consent as the owner or the eventual sale of the land. Regardless, the proposed plans for the Site have allowed the Nant Street corridor to remain undeveloped, due to the passage of the various pipelines along its length. Therefore the Nant Street corridor may be included in the Site or ultimately excluded based on CoBB's process and decision. With the exception of the unformed road, Nant Street, relevant owners' consents have been given for the lodgement of this Environmental Assessment covering the land parcels described in **Table 2-1** and is presented in **Appendix B**.

Chapter 2 Site Location and Context

2.2 Site Environs

2.2.1 Southlands Site

North and North East

The Site is located to the south west of the BIP, separated by the Sydenham - Botany Goods Railway Corridor. BIP is located to the north and north east of the Site. Several chemical manufacturing businesses, including Orica, have manufacturing and distribution facilities at the BIP.

Qenos Pty Ltd (Qenos) own the tank farm facility, known as *The Nant Street Tank Farm,* located immediately north of Southlands Block 1. This site has been used historically to store hydrocarbons.

The Mobil Botany Oil Distribution Terminal is located immediately to the north of Southlands Block 2. Beyond the Mobil facility, there is a vacant, currently undeveloped site, owned by Valad Property Group.

Located approximately 0.4 km due west of the Mobil Terminal is another chemical business, Nuplex Industries (Aust) Pty Ltd. This site has frontage on Stephen Road.

West

A chemical manufacturing facility owned by Solvay Interox Pty Ltd (Solvay) is located to the west of the Site, separated by Port Feeder Road and Floodvale Drain. Beyond Solvay are other various industrial facilities.

South

McPherson Street forms the southern boundary to the Site. On the southern side of McPherson Street, there is a shipping container storage facility (Honlong site) and the former MCS land (now being redeveloped for a new warehouse / distribution facility for Toll Logistics). A warehouse owned by Gazal Corporation Limited, an apparel manufacturer, is located to the south of Block 2. Beyond the former MCS land to the south (and fronting Botany Road) is a Goodman managed industrial estate identified as Discovery Cove.

East

The Sydenham to Botany railway line is located beyond the eastern boundary. The site on McPherson Street on the eastern side of the railway is understood to be occupied by a light engineering works.

2.2.2 New Link Road Site

The adjoining landholders to the east and west of the New Link Road would be the former MCS land and Discovery Cover Estate. To the north of the New Link Road Site would be McPherson Street and to the south, Botany Road.

2.3 Context of Orica operations and the Southlands Site

Various infrastructure, including above ground pipelines and groundwater extraction bores, which form the PCA of the BGC Project, are located on the Southlands Site, principally along the McPherson Street boundary (extraction wells) and the western margin of Springvale Drain (above ground pipelines). The PCA extracts groundwater, which is pumped via pipelines to the GTP at the BIP.

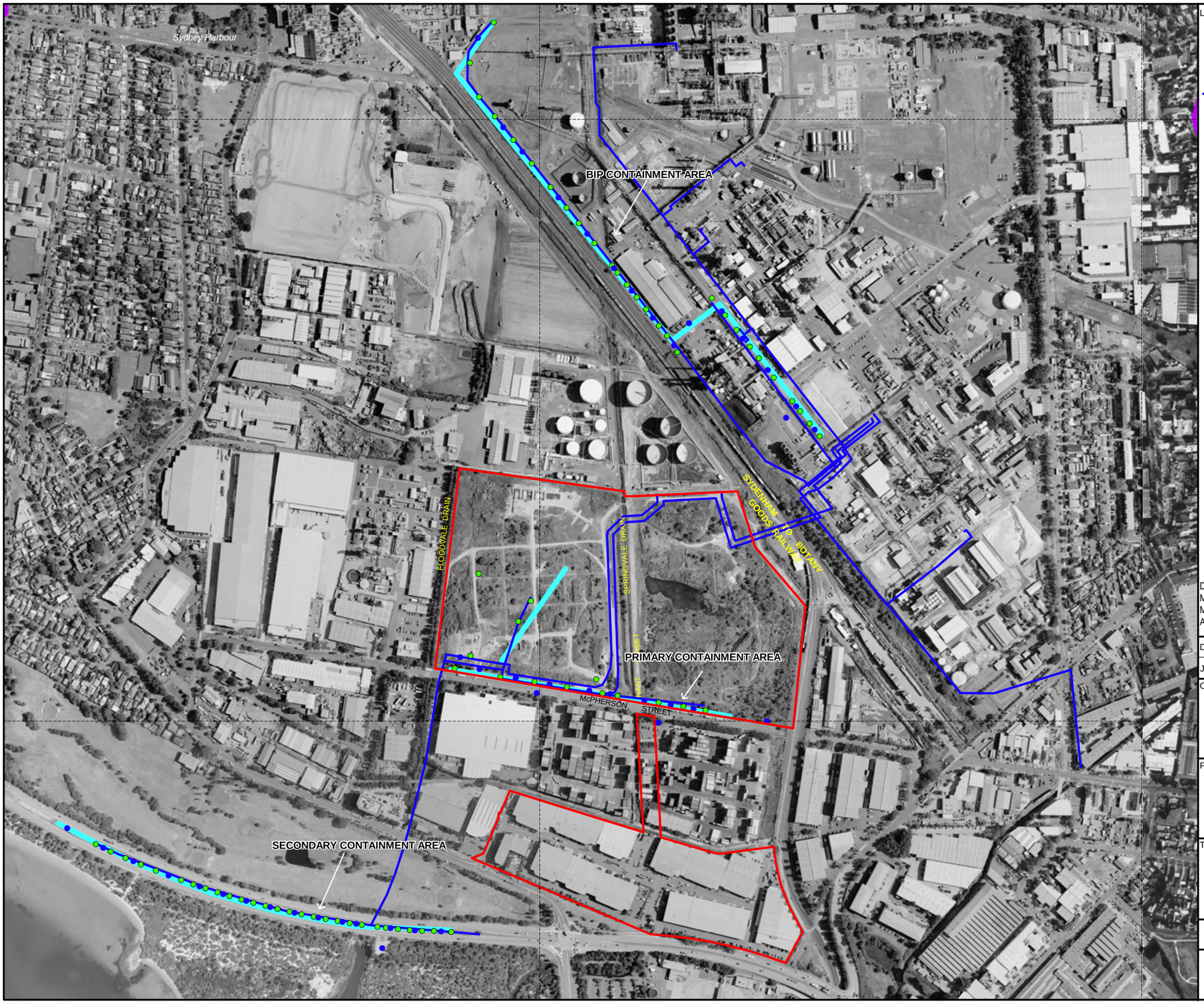
The discussion below provides a summary of these operations and the context of how these operations relate to the Southlands Site and the proposed development.

2.3.1 Botany Groundwater Cleanup Project

As a result of historical manufacturing activities at the BIP, there is a legacy of groundwater contamination within the Botany Sands Aquifer. Orica has stated that it regrets the groundwater contamination caused in the past and that it is committed to the ongoing extraction and containment works to protect the environment and surrounding community.

Today, the groundwater contamination is present in several underground plumes, which have been identified and are moving with the groundwater in a south westerly direction toward Botany Bay. The most concentrated of the plumes is centred beneath the Southlands Site.

The BGC Project involves the extraction of contaminated groundwater from three containment lines to achieve hydraulic containment and the treatment of that groundwater at the GTP (refer to **Figure 2-2**).



Legend:

- Hydraulic Containment Extraction Well
- Hydraulic Containment Monitoring Well
- Groundwater Pipeline Network

Datum: GDA94, Projection: UTM, Grid: MGA Zone 56
Map compiled using SKM Aerial Imagery, January 2005, Mapinfo StreetPro (and CadastralPlus) © 2005 and PSMA Australia Ltd.

Drawn: AJW	Approved: NB	Date: 13/08/2009
Job No: **43217541**	File: 43217541-010.wor	

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Project

SOUTHLANDS REMEDIATION AND DEVELOPMENT ENVIRONMENTAL ASSESSMENT

Title

ORICA GTP HYDRAULIC CONTAINMENT AREAS

Figure: **2-2**

URS

Notice of Clean up Action

In September 2003 (subsequently amended and consolidated in February 2004) the Department of Environment and Conservation (DEC) (now NSW DECC) issued a NCUA No. 1030236 to Orica requiring remediation of the chlorinated hydrocarbon contaminant plumes.

Remediation works are ongoing at BIP, the Southlands Site and Foreshore Road.

BGC Project Objective and Outline

The broad objective of the BGC Project is to achieve hydraulic containment and reduction of the contaminants in the groundwater in and around the BIP, to meet the requirements of the NCUA and stop the plumes moving towards Penrhyn Estuary and Botany Bay.

The key elements of the groundwater treatment process are:

- the extraction of groundwater from the wells installed in the three containment lines (Primary, Secondary and BIP Containment Area);
- transfer of groundwater via pipelines to the GTP for treatment; and
- reuse of treated water.

Extraction Wells and Pipelines

Groundwater is extracted by a submersible pump suspended inside each extraction well, discharging into the transfer pipeline leading to the GTP. Extraction rates are designed to be adjustable in response to changes in groundwater flow patterns and reducing contamination levels over time.

Monitoring wells were installed along the containment lines for sampling and measurement, to assess and optimise the effectiveness of the hydraulic containment. Some of these containment lines and wells are located on the Southlands Site and are presented in **Figure 2-2.** Relocation of the pipelines is not part of this proposal and would be carried out separately by Orica.

Existing Groundwater Treatment Infrastructure

The existing BGC Project infrastructure is shown on **Figure 2-2**. The primary purpose of the BGC Project is to reduce the movement of groundwater towards Botany Bay at strategic locations (referred to as hydraulic containment). This is achieved through large scale groundwater pumping. The extracted groundwater is delivered, via a series of above ground (and to a lesser extent underground) pipelines, to the GTP.

The pumping infrastructure comprises three main groundwater extraction areas, each of which comprises a series of groundwater extraction bores and groundwater monitoring wells, including:

- the BIP Containment Area, located along the south western boundary of BIP and designed to intercept and contain contaminated groundwater at the western boundary of the BIP site;
- the PCA is located along the southern (McPherson Street) boundary of Southlands. It is noted the PCA also includes three other extraction bores, located in the central southern portion of Southlands Block 2 (EWB01, EWB02 and EWB14D); and
- the Secondary Containment Area (SCA), located along the centre of Foreshore Road.

Chapter 2 Site Location and Context

Groundwater Monitoring Infrastructure

The existing groundwater monitoring infrastructure is shown on **Figure 2-2**. This network of shallow and deep groundwater monitoring wells is designed to enable ongoing monitoring of both the hydraulic containment performance of the BGC Project as well as periodic (quarterly) 'chemical' monitoring of groundwater quality.

The locations of the proposed buildings and infrastructure across Southlands would require replacement of much of the groundwater monitoring infrastructure presently at the Site. The remedial approach for the Site has therefore been developed to allow for a replacement of the monitoring well network and distribution pipelines to ensure that continued access is achieved.

2.4 Southlands Project Considerations

The consideration of Orica's groundwater remedial obligations is paramount in both the design of the Project, and the timing of its implementation. The future use of the Southlands Site would incorporate all necessary infrastructure required for Orica's ongoing groundwater remediation works on the Site and is designed not to compromise Orica's ongoing commitment to the BGC Project.

The proposed development has been designed to enable Orica to continue ongoing groundwater investigations and remediation works including:

- performing further investigations and trialling removal technologies for contaminant source areas beneath Stage 3 prior to development in Stage 3 (which will then be the subject of a separate Project Application for that stage of the Project);
- allocating corridors for potential future in-situ remedial technologies; and
- maintaining access to the Site for the purposes of monitoring and investigation works following the development and divestment of the Site.

The Southlands RAP provides the remediation requirements and approach to remediate (and / or manage as appropriate) identified contamination so as to render the Southlands Site suitable for the proposed commercial / industrial development land use, in accordance with the relevant DECC, NSW endorsed guidelines.

The remediation and development approach is contingent upon the implementation and verification of specific systems / plans for which Orica is either seeking, or already has, approval for these systems through separate approvals processes under the NCUA. The systems / plans include the following:

- Maintain the GTP system throughout and following implementation of the Southlands Remediation and Development Project in accordance with the terms of the Orica NCUA or other regulatory requirements.
- Temporary Aquifer Storage and Recovery as the primary contingency system for times when the GTP is not in operation.
- Springvale Drain mitigation:
  - Infilling the Springvale Drain re-alignment channel; and

– Installation of a shallow groundwater extraction system aimed at reducing the discharge of contaminated shallow groundwater into Springvale and hence reducing the potential for volatile emissions from surface waters to ambient air in the vicinity of the Drain.

In addition it is noted that works relating to the realignment of existing groundwater extraction infrastructure to suit the development are not part of this proposal and the relocation of the infrastructure on the Site will be carried out separately by Orica.

3.1 Introduction

This chapter addresses the need for the project and justification for Orica's proposal in terms of its consistency with State strategic plans and guidelines, ongoing commitments on the Site and the benefits of the proposal.

3.2 State Strategic Plans and Guidelines

The Sydney Metropolitan Strategy provides the overarching direction for the growth and development within Sydney over the next 25 – 30 years. The Strategy was released by the NSW Government in December 2005. Central to the successful implementation of the strategy is the provision of new employment lands and the efficient utilisation of the older existing industrial areas. The Southlands Site is designated as employment land within the Botany Bay Area and part of a larger employment corridor with strong links to Port Botany and Sydney International Airport.

Some key issues and trends noted in the Metropolitan Strategy are:

- in terms of the spatial pattern of economic development a transport and logistics cluster is emerging in the Port Botany / Mascot area (page 47 of the Metropolitan Strategy);
- industrial premises generally have buildings with 2,000 – 10,000 square metres (m^2) floor space with small associated offices (page 52);
- across Sydney distribution centres are typically 10,000 m^2 floor space with high internal clearances (8 m or more) on sites typically over 5 ha, some as large as 40 – 100 ha (page 52); and
- the Strategy notes that the future demand for employment land for the period to 2031 is some 19,000 ha based on current trends (page 53).

A compact approach to employment lands is required to support Sydney's competitiveness, to make best use of existing and new infrastructure, to increase the availability of jobs close to where people live and reduce the extent of the additional employment land required (page 54).

In response to these factors, the Metropolitan Strategy for Sydney proposes the following major objective and initiatives for the Economy and Employment within Sydney (page 41):

Objective	A1	Provide Suitable Commercial Sites and Employment Lands in Strategic Areas.
Initiatives	A 1.1	Provide a framework for accommodating jobs across the city.
	A1.2	Plan for sufficient zoned land and infrastructure to achieve employment capacity targets in employment lands.
	A1.3	Engage with industry regarding employment land stocks.
	A1.4	Contain the rezoning of employment lands to residential zonings across Sydney.
	A1.5	Protect and enhance employment lands of State significance.
	A1.6	Improve planning and delivery of employment lands.
	A1.7	Monitor demand and supply of employment lands.
	A1.8	Establish a framework for the development of Business Parks.
	A1.9	Facilitate the use of old industrial areas.

The Southlands Remediation and Development Project directly addresses the objective for employment land supply and contributes to initiatives A1.2, A1.5, A1.6 and A1.9 above.

Chapter 3 Project Need & Justification

3.3 The Proposal

The proposal to develop the Southlands Site is also consistent with the Sydney Metropolitan Strategy. The strategy quotes a prediction that over the next 25 years approximately 15,000 m^2 of new industrial floor space will be required in the metropolitan area. There is currently a high demand for industrial space in the area that is well located and well serviced to enable the best use of existing and new infrastructure. Consistent with these objectives, the Project enables vacant land in the centre of a significant industrial hub, and in close proximity to both the port and the airport, to be used for employment purposes. It is advantageous that such a large industrial site that is appropriate to the proper functioning of industry at the port, airport, and along the city corridor is transformed over time to efficient uses consistent with current and forecast industrial requirements.

It is envisaged that the Site would become a major industrial and warehousing estate servicing Port Botany and the Sydney Metropolitan Area, whilst maintaining all necessary infrastructure for Orica's ongoing groundwater remediation.

As outlined in **Section 2.4**, Orica proposes a development that may be coordinated with the ongoing groundwater remediation requirements at the property.

The development of the Site fits into Orica's more comprehensive strategy to address its historical contamination issues at, and adjacent to the BIP. In addition to the Southlands development, this strategy incorporates such projects as:

- the BGC Project;
- recycling of treated water from the GTP by businesses at the BIP as well as for neighbouring industrial businesses;
- the proposed export and destruction of hexachlorobenzene (HCB) waste currently stored in purpose-built facilities at the BIP;
- the proposed remediation of the Car Park Waste Encapsulation (CPWE) using Directly-heated Thermal Desorption technology;
- soil and groundwater investigations in the area of the former chlorine plant at the BIP; and
- a review of vacant or under-utilised Orica land at the BIP to improve the value of those areas to Orica.

Collectively, these projects represent a significant investment into the management of contamination at the BIP and adjacent areas, with several providing additional funding for the ongoing activities required to clean up the various legacies of past industrial activity.

From a manufacturing perspective, the Southlands Site is surplus to Orica's needs and the company is proposing to develop and divest the Site. The land is zoned industrial and some soil remediation is required to render it suitable for industrial use. A warehousing development would allow continued access to perform groundwater remedial works on the Site as part of the BGC Project.

The proposed development is envisaged to have the following benefits:

- making efficient and effective use of a large vacant parcel of industrial land at the heart of Sydney's major industrial and ports precinct;

- achieving combined remediation and development of the Southlands property to create a new industrial estate;
- achieving a fit with Orica's more comprehensive strategy to address its historical contamination issues at, and adjacent to, the BIP;
- attracting a range of new users through provision of a high quality estate;
- remediating the Site and provision for the ongoing groundwater treatment by Orica allowing Orica to meets its ongoing environmental obligations;
- providing additional benefits in the area by improving existing traffic problems through works to Hills and Exell Street intersections with Botany Road;
- providing appropriate flood mitigation to ensure that the Stage 1, 2 and 3 development does not contribute to a significant off-site impact from storm and flood waters; and
- addressing the state objective for the supply of employment land.

Stage 2 of the Project would also present additional benefits in the area by improving existing traffic problems through a New Link Road between Botany Road and McPherson Street through the existing Goodman Discovery Cove Estate.

Alternatives to the Project | Chapter 4

4.1 Introduction

This chapter addresses the alternatives considered for the project in the context of the viability of permissible land uses under local planning instruments for the Site.

4.2 Potential Uses of the Site

The Site is located within the Botany 4(a) Industrial Zone under the *Botany Local Environmental Plan 1995*. In this zone a wide range of industrial uses are permissible with consent including container terminals, warehouses and distribution centres.

The Site is in an employment generating area located within the City to Port Corridor of the Sydney Metropolitan Strategy. The land therefore represents an employment generating asset for the Botany Bay and Metropolitan areas.

As discussed in **Chapter 3**, the Sydney Metropolitan Strategy provides the overarching direction for the growth and development within Sydney over the next 25-30 years. Central to the successful implementation of the strategy is the provision of new employment lands and the efficient utilisation of the older existing industrial areas. The Site is designated as employment land within the Botany Bay Area and part of a larger employment corridor with strong links to Port Botany and Sydney International Airport.

4.3 Permissible Uses

Potential uses on the Site need to be consistent with its current 4(a) zoning. In the 4(a) zone, excluding ancillary, minor purposes or service activities such as convenience shops etc, the following primary uses are permissible with consent:

- air freight forwarders;
- automotive uses;
- bulk stores;
- bus depots;
- container terminals;
- industries and light industries;
- materials recycling yard;
- motor showrooms;
- motor vehicle repair workshops;
- road transport terminal; and
- warehouses or distribution centres.

The suitability of these uses is discussed in more detail below.

Chapter 4 Alternatives to the Project

4.3.1 Air freight forwarders

This permissible use is compatible with the proposal and can be accommodated within the proposed built form. It is considered that this use (air freight forwarders) may be expected to occupy the warehouses and offices as proposed.

4.3.2 Automotive uses

This land use involves the sale and fitting of automotive accessories. The Site location is not well suited to retail activity given its poor visibility and relative isolation from other automotive activities in the Sydney Metropolitan Area. Therefore, while it is a permissible use for the zoning of the Site, this use is not considered feasible.

4.3.3 Bulk stores

This land use is compatible with the proposed purpose for certain types of goods but not, for example, for the storage of potentially hazardous goods. Under the *Environmental Planning and Assessment Model Provisions, 1980* this use is defined to include a building or place used for the bulk storage of goods, where the goods stored are not required for a shop or commercial premises on the same parcel of land or adjoining land in the same ownership. Such a use may be able to be accommodated within the proposed built form, however it is not anticipated that there would be significant tenant interest.

4.3.4 Bus depots

This land use involves the use of the premise for the servicing, repair and garaging of buses and other vehicles used for a bus transport undertaking.

The Site falls within an area serviced by the State Transit Authority of NSW that already has bus depots at Port Botany, Randwick and Waverley. The Site is considered too distant from areas in the metropolitan area such as Western Sydney that are serviced by private bus operators. In addition, land values in the Botany area are such that it is unlikely that a future land owner could afford to purchase land in the area and solely use the land as a depot on an ongoing basis. To consider this use is therefore likely to be financially unviable.

Therefore, while it is a permissible use under current zoning, a bus depot is not considered feasible or likely.

4.3.5 Container terminals

The Site is conceptually well suited for a container terminal due to its location relative to Port Botany, the regional road system and the potential access to a nearby rail line. However in assessing this option, the following factors need to be considered:

- land value;
- availability of other land for container terminals;
- consistency with Metropolitan Strategy; and
- costs associated with developing the Southlands Site.

These factors are discussed in more detail below.

The storage of containers is generally more commercially viable on land with lower values. Current land values in the Botany Industrial Area are high (i.e. in excess of $500/m^2$ for serviced land) due to heavy demand from port related industries for warehouse and industrial space with close proximity to the Port, the city and the airport. The demand for this space corresponds to the Metropolitan Strategy locating industrial activities and employment within easy access of the main Sydney market and therefore the warehousing space is just as legitimate in a port located location.

The Site will be the subject of significant expenditure to realise its development potential and therefore it will need to attract full commercial rents to justify that expenditure. Despite the current surplus of empty containers in Sydney and the demand for storage space, it is highly unlikely that container park operators will be willing to meet market rental expectations, and it would therefore be unreasonable to expect the revitalisation and reuse of this land with its associated costs simply to provide for a use that would not prove to be viable.

In the context of the existing land value and the costs to deliver a currently unutilised site, container storage is not seen as a viable commercial use of the land.

Other previously undeveloped areas have recently been brought on line for container storage within a 3 km arc to the north – north-west of Sydney Airport. This land is more suited to the passive container storage use as it is limited in its development potential by noise, being under flight paths etc. Container storage is also a use well suited to short term / interim use of land and may be an option that is investigated further as a short term use for Stages 2 and 3 of the project before redevelopment of these areas takes place but would need to be the subject of a more detailed investigation, consultation and approvals.

Further, the long-term use of the land for the storage of containers is not consistent with the objectives of the 4(a) zone because it does not contribute to economic and employment growth in the locality and sub-region. In addition, container storage is not consistent with the Sydney Metropolitan Strategy as it would not generate significant levels of employment on a long-term basis.

Based on the above issues, use of the Site for a container terminal is not considered to be a likely feasible land use alternative.

4.3.6 Industries and light industries

The land and the location are suitable for both industrial and light industrial uses. There is clear evidence in the area of demand for industrial uses but given the proximity to the Port and Airport, warehousing, distribution and processing tend to be the governing industrial processes.

There is clear demand for warehouse and distribution type users requiring industrial / warehouse space ranging in size, with ancillary office and support space.

4.3.7 Materials recycling yard

There is an on-going demand for sites for the recycling of materials, particularly building materials. However, this use generally has environmental impacts and is difficult to integrate with other activities. The Site is also considered too valuable to support the storage of low value materials, as noted above.

Chapter 4 Alternatives to the Project

4.3.8 Motor showrooms

The Site location is not well suited to retail activity given that it is not located on a main thoroughfare and is relatively isolated from other similar uses in the Sydney Metropolitan Area. Therefore, while it is a permissible land use, this use is not considered likely.

4.3.9 Motor vehicle repair workshops

This type of use is generally a small scale use. The Site location is not well suited to this activity, and it is not considered likely.

4.3.10 Road transport terminal

This involves the use of the Site for the bulk handling of goods for transport by road, including facilities for the loading and unloading of vehicles used to transport those goods and for the parking, servicing and repair of those vehicles.

Considering the Site and its location, it could be used for this purpose. However, the Port Botany facility already performs the function of a road transport terminal interface for container activities through the port. At this time there are no activities in the Botany Bay subregion that require a bulk handling facility allied to transport of bulk goods by road. Therefore, while it is a permissible use for the zoning of the Site, this use is not considered to be likely.

4.3.11 Warehouses or Distribution Centres

Under the Botany Local Environmental Plan, a warehouse or distribution centre means a building or place used for the purpose of storing goods or materials which have been produced or manufactured and includes a bulk store, but does not include the retail sale of goods or materials.

There is clear demand for warehouse and distribution type users requiring industrial / warehouse space ranging in size, with ancillary office and support space. The land also represents an employment generating asset for the Botany Bay and Metropolitan areas. This land use is therefore considered an appropriate, beneficial use of the Site.

4.3.12 Passive Open Space / Environmental Project

At one of the public workshops held during preparation of this Environmental Assessment, community representatives asked Orica to consider setting aside the Southlands Site, or part of it, as open space for an environmental project, such as a wetland. Orica has considered this recommendation and written to the workshop participants advising that Orica is not in a position to set aside the land for such use.

The land represents an employment generating asset for the Botany Bay and Metropolitan areas. The Site will be the subject of significant expenditure to realise its development potential and therefore it will need to attract full commercial rents to justify that expenditure. The proposed development has been developed with consideration for the site location, environmental issues and planning requirements. It is proposed that the land be rendered fit for industrial use, consistent with its industrial zoning, with the inclusion of extensive landscaping and the provision of habitat for the Green and Golden Bell Frog.

4.3.13 Do Nothing

The 'do nothing' scenario would mean that the Site would remain a large vacant parcel of industrial land. This scenario would not see the Site used for any meaningful purpose and would therefore not see it contribute as an employment generating area, for the benefit of the port and the city.

4.4 Proposed Use of Site

Based on the Proponent's evaluation of the potential uses of the Site, it was determined that creation of a new industrial / warehousing estate is the most likely and viable use under current zoning provisions.

5.1 General

The Project comprises the following key components:

- new industrial / warehousing development (Stages 1 and 2);
- a New Link Road in Stage 2; and
- internal reconfiguration of Goodman's Discovery Cove Estate in Stage 2.

An aerial perspective of the development is presented in **Figure 5-1**. The key components are identified in **Figures 5-2** to **5-6**. It is noted that these figures show Stage 3 of the industrial / warehousing development for information only, as this Application is seeking approval for only Stages 1 and 2 of the development.

It is noted that the further detail of the Project is presented in the *Landscape Drawings, Civil Drawings, Survey Plans* and *Architecture Drawings* submitted with this Application to the Department of Planning. For ease of reference, only pertinent drawings are reproduced in this Environmental Assessment. The full set of drawings is available from Orica upon request.

5.2 Project Stages

Development would be undertaken sequentially. Stages 1 and 2 would comprise the following:

Stage 1

- conduct earthworks, works to address the RAP and filling to new finished levels for Stage 1 (western side of Southlands);
- conduct earthworks, and erosion and sediment controls for Stage 2 (south eastern portion of the Site) to create levels to satisfy the flood management strategy and create compensatory flood storage;
- staged development of new warehouse and office buildings, hard stand areas, car parking and landscaping areas for the western side of the Site (west of the unformed Nant Street) for commercial / warehousing facility with delivery of the proposed buildings on Stage 1 to be staged dependent upon market requirements;
- extension of necessary infrastructure services as required;
- construction of a new private entry road from McPherson Street (east of, and adjacent to Nant Street with a crossing of Nant Street and Springvale Drain) providing access to Stage 1;
- maintain and landscape Springvale Drain;
- works to Hills and Exell Street intersections with Botany Road in accordance with preliminary plans, to be agreed with CoBB;
- fencing of Stages 2 and 3 areas on the Southlands Site;
- creation of easements within the Southlands property to provide for existing and potential future groundwater remediation infrastructure,

- the staged creation of subdivision of the Southlands Site, former MCS land parcel and Discovery Cove Estate in order to facilitate the proposed development. Subdivision will occur on a staged basis to suit each stage of the works; and
- landscaping.

Stage 2 (subject to acquisition of land rights)

- earthworks to suit required levels;
- development of the south eastern portion of Southlands (east of the unformed Nant Street) for warehouses with integrated office space;
- a New Link Road to Botany Road and necessary reconfiguration of Discovery Cove Estate;
- the Proponent recommends that the New Link Road be adopted by CoBB (in their Section 94 Plan) in lieu of its current road proposal for the precinct. Negotiation of a Voluntary Planning Agreement, or a similar arrangement, with CoBB and benefiting landowners in the precinct for contribution to the cost of, and the co-development of the New Link Road and the additional drainage infrastructure is anticipated for Stage 2. It is expected that this will be a condition of the Minister's approval for Stage 2 works;
- incorporation of required drainage infrastructure in tandem with the New Link Road to resolve flooding problems in the local catchment and therefore allow the development of Stages 2 and 3; and
- staged subdivision of land to suit that stage of works.

Stage 3 (to be the subject of a separate Project Application)

- development of the north eastern side of the Site, (east of the unformed Nant Street) for industrial / warehousing facility.

Stage 3 would not be developed until an agreement is achieved with the DECC with respect to the required remedial works.

5.3 Overall Industrial Warehouse Facility Proposal

The overall development (Stages 1 – 3) would provide a total floor space area of approximately 79,000 m^2. It would operate on a 24 hours / 7 days a week basis. The overall development would be served by a total of 820 parking spaces. An allowance has been made for a future decked area offering another 300 spaces if required in the future. The completed overall development is proposed to have the characteristics described in **Table 5-1** and presented in **Figure 5-4**.

It is noted that Stage 3 is included in **Table 5-1** to more accurately portray overall development at the Southlands Site once it is fully developed. However only Stage 1 and 2 are proposed in the current application and Stage 3 will be the subject of a future application.

Table 5-1 Overall Development Characteristics

Component	Attribute
Total warehouse	72,200 m^2
Total office	6,750 m^2
Café / Amenities	240 m^2
Total Building Area	**79,190** m^2
Possible multi deck car parking	4,655 m^2
Total Awning	2,565 m^2
Footprint (incl awning, parking deck)	**83,355 m^2**
FSR	**0.48:1**
Site Cover	**50.5%**

* Note: Stage 3 is included in this table.

design+	Southlands Remediation & Development Project	Aerial Perspective	NTS	SRD DA015 (A)
	McPherson Street, Botany	Part 3A Project Application	12 Sep 07 VK	

Legend:

Drawn: AJW	Approved: NB	Date: 28/04/2008
Job No: **43217541**	File: 43217541-014.wor	

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Project

SOUTHLANDS REMEDIATION AND DEVELOPMENT ENVIRONMENTAL ASSESSMENT

Title

AERIAL PERSPECTIVE

Figure: **5-1**

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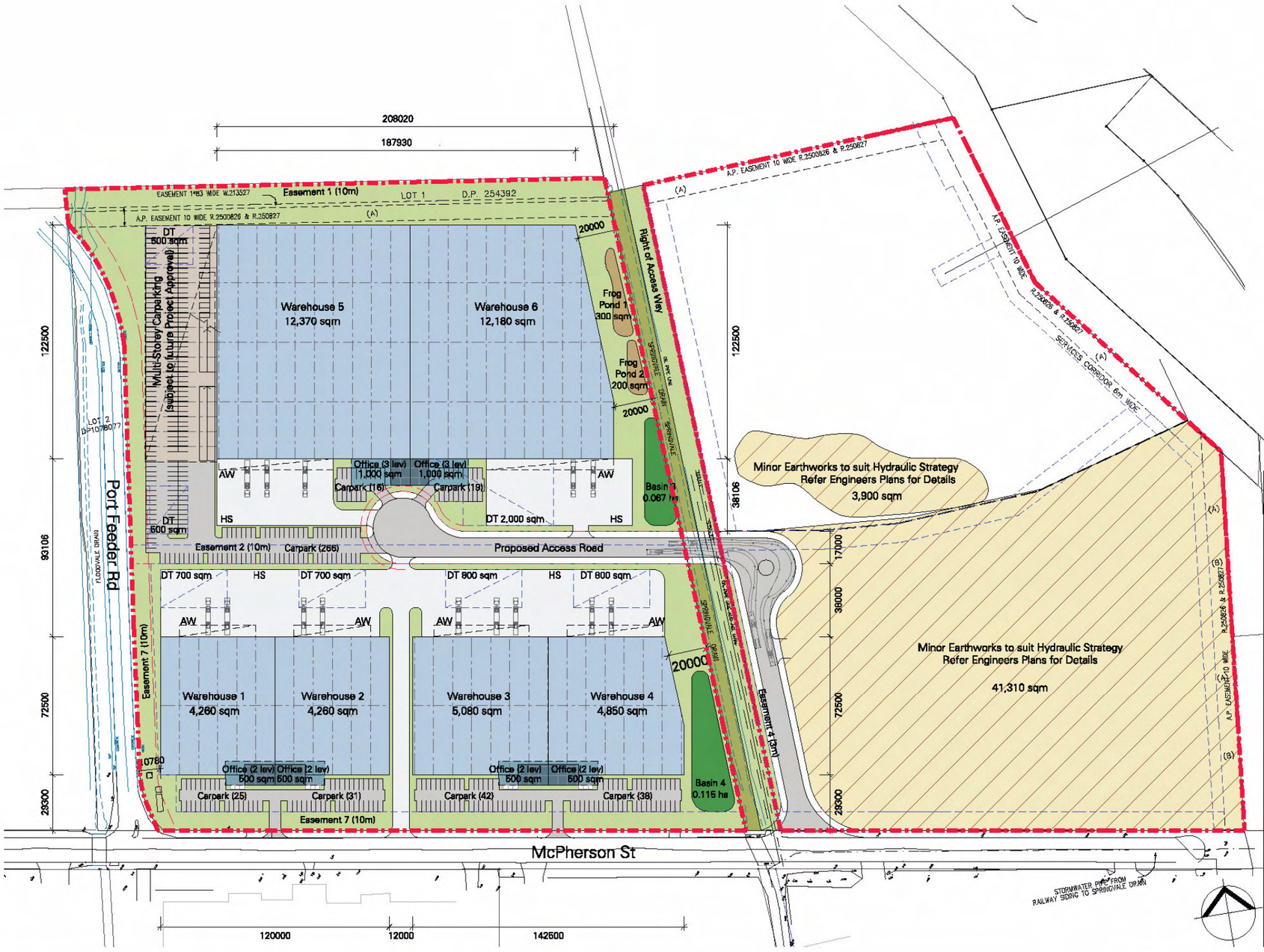

LEGEND

DT	Inground Detention Tank
AW	Awning
HS	Hardstand

Development Area Schedule

STAGE 1

Total Site Area	98,150 sqm
less Detention Basins	1,820 sqm
less Access Road	3,440 sqm
Dev. Site Area	92,890 sqm
Total Warehouse	43,000 sqm
Total Office (2 & 3 levels)	4,000 sqm
Total Floor Area	47,000 sqm
Awning	1,840 sqm
Future Parking Deck	4,655 sqm
Footprint (incl awning & parking deck)	50,935 sqm
Site Cover	55 %
FSR	51 %
Landscape Area - 23%	20,950 sqm
Carparking on grade	442
Future Carparking (2 lev)	300
Minor Earthworks Area	45,210 sqm

design+ | Southlands Remediation & Development Project | McPherson Street, Botany | Part 3A Project Application | **STAGE 1 Site Plan** | 1:1000 @ A1 1:2000 @ A3 | 23 Jan 08 VK | SRD DA006 (B)

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Job No: **43217541** | File: 43217541-015.wor

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SOUTHLANDS REMEDIATION AND DEVELOPMENT ENVIRONMENTAL ASSESSMENT

Title

PROJECT APPROVAL (STAGE 1) LANDUSE SCENARIO

Figure: **5-2**

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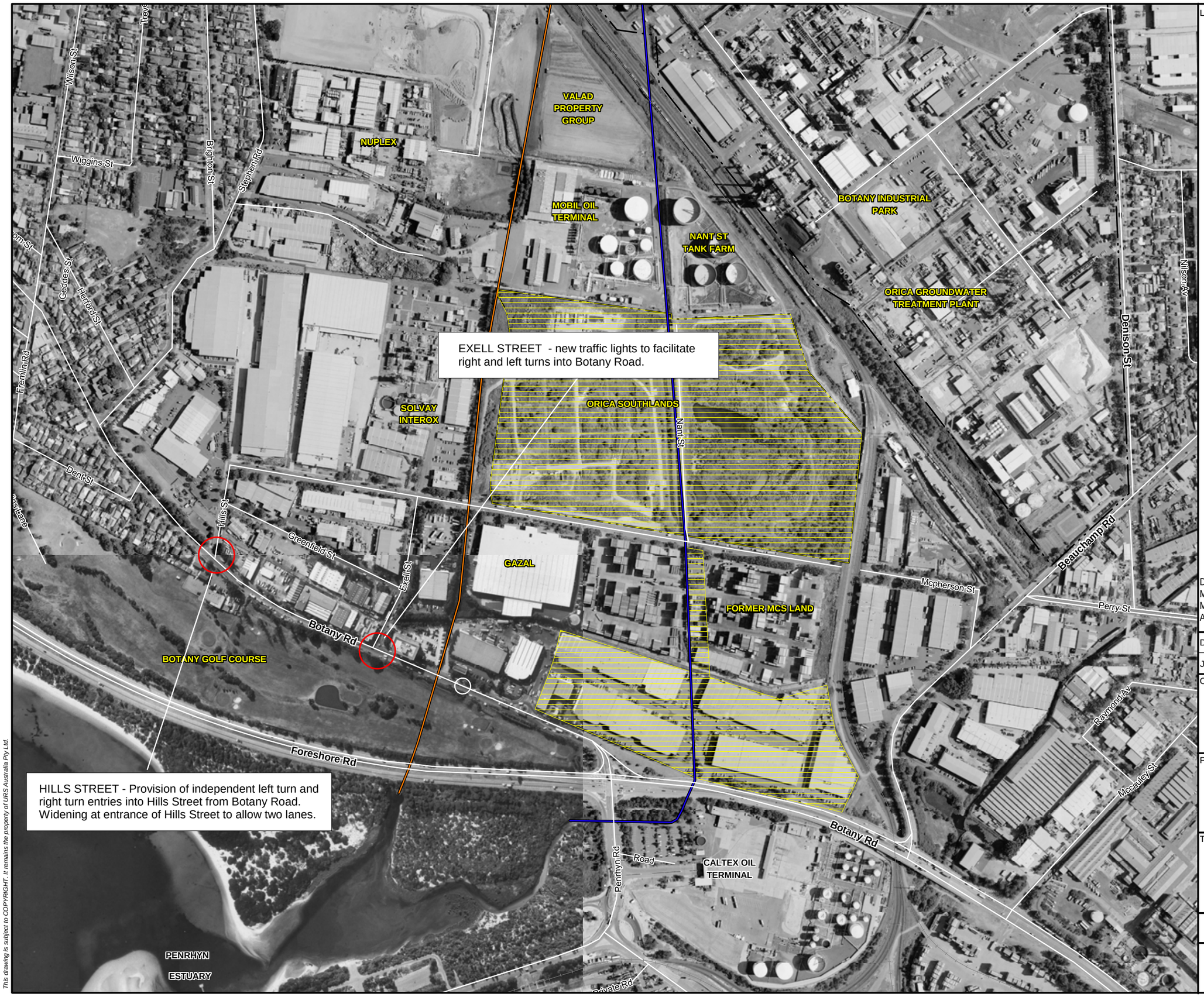


Legend:

- PROPOSED DEVELOPMENT
- SPRINGVALE DRAIN
- FLOODVALE DRAIN

0 100 200

Metres

Datum: GDA94, Projection: UTM, Grid: MGA Zone 56
Map compiled using SKM Aerial Imagery, January 2005, Mapinfo StreetPro (and CadastralPlus) © 2005 and PSMA Australia Ltd.

Drawn: AJW	Approved: NB	Date: 28/04/08
Job No: **43217541**	File: 43217541-013.wor	

Client

ORICA AUSTRALIA PTY LTD/
GOODMAN PTY LTD

Project

SOUTHLANDS REMEDIATION AND DEVELOPMENT ENVIRONMENTAL ASSESSMENT

Title

STAGE 1 TRAFFIC IMPROVEMENT WORKS

Figure: **5-3**

URS

SOUTHLANDS AREA SCHEDULE	
Lot 1 DP 254392	0.286 Ha
Lot 1 DP 528660	9.530 Ha
Lot 1 DP 85542	6.130 Ha
Lot 11 DP 109505	2.343 Ha
TOTAL SITE AREA	18.288 Ha
Springvale Drain	0.289 Ha
Nant Street	0.347 Ha

LEGEND

DT Inground Detention Tank

MASTERPLAN DEVELOPMENT AREA SCHEDULE	
Total Site Area	18.288 Ha
less:	
Access Road	0.743 Ha
Detention Basins	1.049 Ha
TOTAL DEV. AREA	16.496 Ha
Total Warehouse	72,200 sqm
Total Office	6,750 sqm
Cafe/ Amenities	240 sqm
Total Floor Area	79,190 sqm
Total Awning	2,565 sqm
Possible Multi-deck Parking	4,655 sqm
FLOOR AREA	79,190 SQM
FOOTPRINT (incl. awning, parking deck)	83,355 SQM
FSR	0.48:1
SITE COVER	50.5%
LANDSCAPE AREA	41,360 SQM (25%)
Carparking Provided -on grade	820
Possible Future Carparking (2 lev)	300
Total Carparking	1120

STAGE 1	
TOTAL SITE AREA	98,150 sqm
DEV. SITE AREA	92,890 sqm
Total Warehouse	43,000 sqm
Total Office	4,000 sqm
Total Facility	47,000 sqm
Carparking Provided -on grade	440
Possible Future Carparking (2 lev)	300
Total Carparking	740

STAGE 2	
TOTAL SITE AREA	46,300 sqm
DEV. SITE AREA	40,310 sqm
Total Warehouse	14,850 sqm
Total Office	1,400 sqm
Cafe/ Amenities	240 sqm
Total Facility	16,490 sqm
Carparking Provided -on grade	280

STAGE 3	
TOTAL SITE AREA	38,430 sqm
DEV. SITE AREA	31,760 sqm
Total Warehouse	14,350 sqm
Total Office	1,400 sqm
Total Facility	15,750 sqm
Carparking Provided -on grade	120

design+ | Southlands Remediation & Development Project | McPherson Street, Botany | Part 3A Project Application | **Masterplan** | 1:1000 @ A1 1:2000 @ A3 | 23 Jan 08 VK | SRD DA005 (B)

Legend:

Drawn: AJW	Approved: NB	Date: 28/04/2008
Job No: **43217541**	File: 43217541-016.wor	

Client

ORICA AUSTRALIA PTY LTD/
GOODMAN PTY LTD

Project

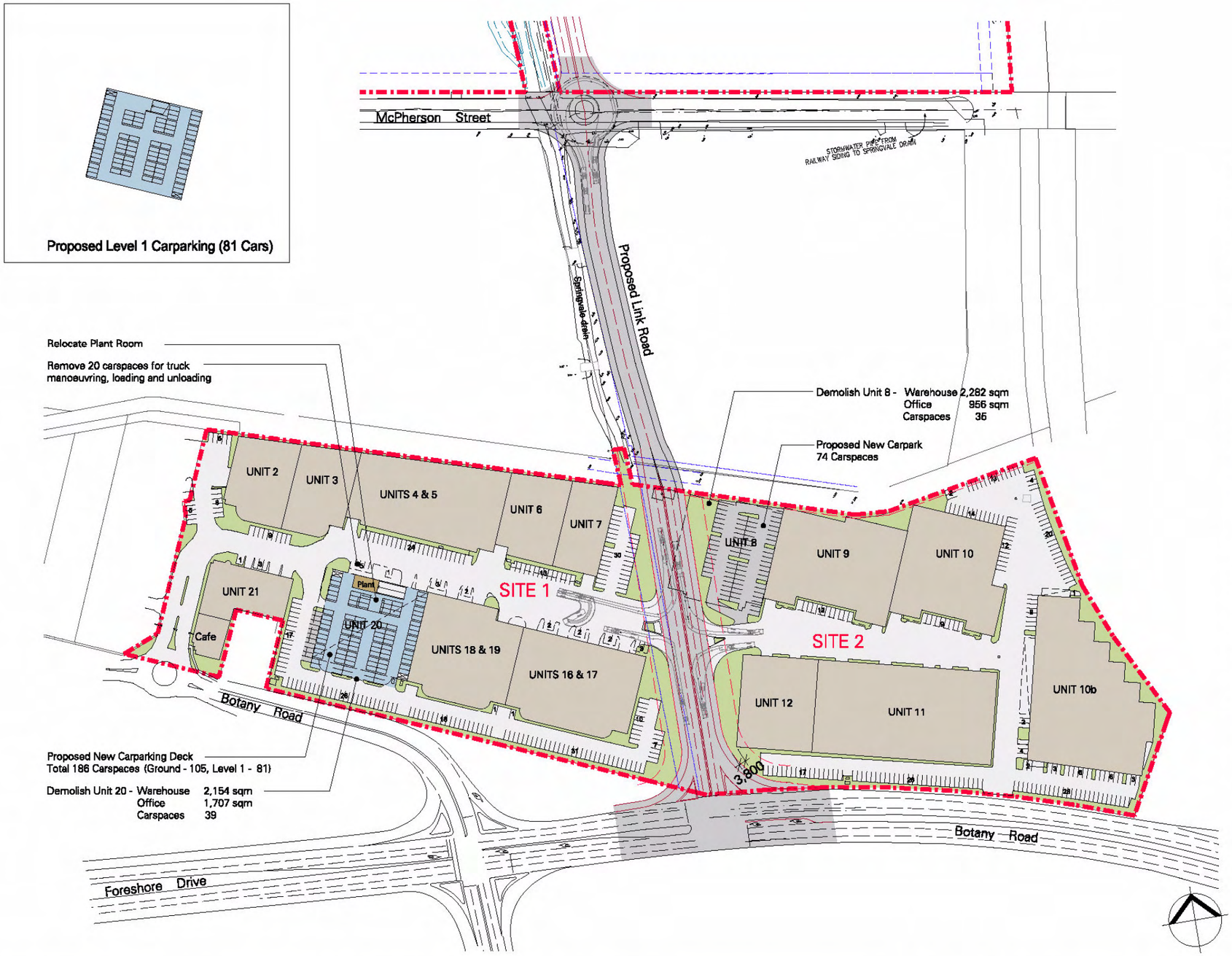
SOUTHLANDS REMEDIATION AND DEVELOPMENT ENVIRONMENTAL ASSESSMENT

Title

STAGE 2 SITE PLAN

Figure: **5-4**

URS



Site Area Schedule

Total Site Area	**75,790 sqm**
Less:	
Proposed New Road	4,245 sqm
Total Developable	**71,545 sqm**
Site 1	**36,710 sqm**
Site 2	**34,835 sqm**
Building Area - Total Existing	49,926 sqm
Building Area Demolished (Units 8 & 20)	7,099 sqm
Carparking - Total Existing	547
less Carspaces leased to Units 8 & 20	74
Total remaining carparking	**473**
Carparking - Total Existing	547
Carparking lost to Road and Hardstand	148
Carparking remaining	399
Proposed New Carparking Deck (2 lev)	186
Proposed New Carparking on Site 2	74
	260
Total Proposed Carparking	**659**
Site 1 Units 2-7, 16-21	
Total Warehouse (excl unit 20)	12,545 sqm
Total Office (excl unit 20)	9,353 sqm
Carparking Existing	297
less Carspaces leased to Unit 20	39
Total remaining carparking	**258**
Total required by council	**391**
Total Proposed Carparking	**393**
Site 2 Units 8-12	
Total Warehouse (excl unit 8)	15,610 sqm
Total Office (excl unit 8)	5,321 sqm
Carparking Existing	250
less Carspaces leased to Unit 8	35
Total remaining carparking	**215**
Total required by council	**328**
Total Proposed Carparking	**266**

design+ | Southlands Remediation & Development Project | McPherson Street, Botany | Part 3A Project Application | **STAGE 2 Road Link Site Plan** | 1:1000 @ A1 1:2000 @ A3 | 12 Sep 07 VK | SRD DA014 (A)

Legend:

Drawn: AJW | Approved: NB | Date: 28/04/2008

Job No: **43217541** | File: 43217541-017.wor

Client

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GOODMAN PTY LTD

Project

SOUTHLANDS REMEDIATION AND DEVELOPMENT ENVIRONMENTAL ASSESSMENT

Title

STAGE 2 ROAD LINK SITE PLAN

Figure: **5-5**

URS

Connell Wagner

Southlands Flood Modelling

Legend:

Drawn: AJW	Approved: NB	Date: 28/04/2008
Job No: **43217541**	File: 43217541-018.wor	

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Project

SOUTHLANDS REMEDIATION AND DEVELOPMENT ENVIRONMENTAL ASSESSMENT

Title

STAGE 2 CONCEPTUAL HYDRAULIC DESIGN

Figure: **5-6**

URS

Chapter 5 Project Description

5.4 Stage 1

5.4.1 Site Preparation and Remediation

Site preparation would involve general bulk earthworks to achieve new site levels to satisfy the flooding assessment requirements and works to satisfy the Southlands RAP.

The stormwater and flood review undertaken for the Project has determined a requirement for filling on Stage 1 (Block 2) to meet the site flood design levels (refer to **Chapter 8** and **Appendix G** for more detail). The remediation approach for Southlands would essentially be achieved 'in tandem' with the flooding solution.

The remediation would be undertaken as described in the Southlands RAP and any conditions of the Auditor's Site Audit Statement (refer to **Appendix I** and **Chapter 9** for further information) and would generally involve:

- vegetation reduction, preliminary screening and segregation of stockpiles and minor hotspot removal;
- filling of the Stage 1 area (other than materials cut from the southern portion of Block 1) with Virgin Excavated Natural Materials (VENM) as defined under the POEO Act 1997 and/or Excavated Natural Material (ENM) as defined under the POEO (Waste) Regulation 2005, with materials appropriately placed to create a physical separation layer in accordance with the Southlands RAP;
- management of asbestos in accordance with the asbestos management component of the CEMP & SSHSEP;
- removal (and storage on BIP) of excavated HCB impacted materials (as previously noted, the Proponent may consider using the Orica Direct Thermal Desorption (DTD) plant proposed for establishment on BIP to treat this material for which separate approvals are being sought);
- earthworks, erosion and sediment controls and vapour management control for the Stage 2 area; this area is proposed to provide an interim compensatory flood storage area with the internal access road to serve as an embankment wall and the proposed visual screening bunding along the McPherson Street boundary of the Site to provide additional floodplain storage depth; and
- backfilling of the Paper Waste Ponds.

A physical barrier would be implemented to prevent contact between Site users and underlying ACM impacted contaminated materials. Detailed design of a physical barrier to ACM impacted materials would be prepared prior to implementation of the remedial approach taking into consideration specific building engineering requirements and the requirements for the southern edges of Southlands (where a physical barrier would not be used due to the presence of GTP infrastructure).

Vapour intrusion mitigation measures for Site structures would be designed to prevent the accumulation of vapours in buildings and structures.

5.4.2 Industrial Warehousing Facility

Stage 1 building works involve the construction of new warehouse and office buildings, hard stand areas, car parking and landscaping areas on the western side of the Site (west of the unformed Nant Street) as shown in *Architecture Drawings SRD DA006 – 010* and as shown in **Figure 5-2**.

The development of Stage 1 buildings would be undertaken in stages to suit tenant demand and would provide a total floor space area of approximately 47,000 m^2 at completion.

The warehouses would be of a high quality design and would incorporate ancillary office components on their primary frontage. The buildings would be metal clad or precast exterior finishes, with a typical roof ridge height up to 14 m. There would be six warehouses each with integrated office space (Warehouses 1 to 6) and truck loading facilities. Roller shutters, storage and any extensive hardstand areas are located generally to the rear of the development away from street frontage. Site coverage for Stage 1 is 51 % and reaches a maximum of 55% including awning and parking deck (achieving a better ratio than the required 60 % as described in **Chapter 6**). The development has been designed to achieve the necessary setbacks described in **Chapter 6.**

The detailed design of the Facility would incorporate vapour intrusion mitigation measures for Site structures as necessary.

The completed development is proposed to have the characteristics described in **Table 5-2**.

Table 5-2 Stage 1 Development Characteristics

Component	Characteristics
Total warehouse	43,000 m^2
Total office	4,000 m^2
Total Facility	**47,000 m^2**
Awning	1,840 m^2
Future Parking Deck	4,655 m^2
Footprint (incl. awning and future parking deck)	**50,935 m^2**
FSR	51%
Site cover (incl. awning and car parking deck)	55%
Landscape Area (23%)	20,950 m^2
Car parking on grade	*440*
Future Car Parking (2 levels)	*300*
TOTAL CARPARKING	*740*

Water and energy efficiency measures would be incorporated into the development as described in **Appendix R**. Detention basins (both in ground and open dry basins adjoining Springvale Drain) are included to ensure no net increase in the Site discharge during storm events. Detailed design of these would consider the requirements of the Southlands RAP.

Building and business identification signs would be incorporated into the design of the building.

Specialist advice regarding preliminary compliance with the Building Code of Australia (BCA) has been provided for Stage 1 (refer to **Appendix E**). This advice would be incorporated into the detailed design. Details demonstrating full compliance of the development with relevant BCA provisions would be provided with the Construction Certificate Application documentation, as is normally required.

Two Frog Ponds (approximately 300 m^2 and 200 m^2) would be constructed adjacent to the north west of Springvale Drain in accordance with the details provided in **Appendix O** and any requirements of the Southlands RAP.

An access road into the Site would be constructed from McPherson Street extending north on the eastern side of Springvale Drain to a roundabout and then heading west into the centre of Stage 1, via a culverted crossing of Springvale Drain.

Landscaping for Stage 1 would cover approximately 23 % of the Site (achieving a better ratio than the required 15 % by the CoBB Industrial DCP). The use of indigenous species common to the area is proposed in accordance with the Landscape Plans for the Site.

5.4.3 Civil Works and Services

An assessment of the availability of the services required for the entire Site has been undertaken (refer to **Appendix F**) and concluded that that it was feasible to provide all infrastructure services to the development Site including, water, sewerage, electricity, gas and communications, subject to required extensions.

In this regard contact has been made with the various supply authorities who have identified required upgrade and extension works for various services and infrastructure.

Sydney Water has advised that arrangements would need to be made with the owner of No. 20-22 McPherson Street for sharing of the existing rising main to provide a suitable sewer connection for the Site. Sewer connection would be provided in accordance with Sydney Water directions.

Water reticulation would require a combination of an extension of services and connection to existing mains. Each individual lot within the development requires frontage to the water main to enable an individual connection and meter.

The Orica GTP operating on the BIP has a design capacity of 15 megalitres (ML) per day. Treated water from the GTP is suitable for non-potable re-use and may be augmented by rainwater harvesting from the Site. Where possible the treated water would be used on Site for fire fighting purposes, landscape watering and toilet flushing.

There is sufficient capacity to provide electricity to the development from the existing 11 kV-supply distribution in McPherson Street and adjacent roads. Additional 1 MVA substations may be required for each lot of the development. The location of the proposed new substation sites would be defined to suit EnergyAustralia on-site requirements at the Construction Certificate stage.

Civil and services drawings prepared for the Project outline the required services extensions to and within the Site.

5.4.4 Traffic Improvement Works

The following traffic improvement works would be undertaken as part of Stage 1 (refer to **Figure 5-3**):

- **Hills Street -** creation of separate right and left turn entry lanes in Botany Road for movement into Hills Street.
- **Hills Street –** widening at the entrance to allow two lanes with a merge on approach to McPherson Street.

- **Exell Street and Botany Road intersection -** new traffic lights to facilitate right and left turns into Botany Road from Exell Street with pedestrian crossings on all approaches.
- Further detail on these improvements is provided in **Chapter 12** and **Appendix L**.

5.4.5 Other

Other activities / works to be undertaken in Stage 1 include:

- works to improve the landscape quality of Springvale Drain in accordance with *Landscape Drawings*;
- fencing as required to Stages 2 and 3 to maintain Site security;
- creation of easements within the Southlands property to provide for existing and potential future groundwater infrastructure in accordance with the *Architecture Drawing – Proposed Easement Plan*, and
- subdivision of the Southlands property, the land parcel to the south of Southlands and to the east of Springvale Drain (currently used for container storage) and the Discovery Cove Estate in order to facilitate the proposed development in accordance with the *Architecture Drawing – Subdivision Plan.*

5.5 Stage 2

5.5.1 Site Preparation

Stage 2 is subject to acquisition of land rights. To facilitate the new industrial development, site levels will be raised to suit flood design levels. Bulk earthworks would be undertaken in accordance with *Civil Drawings*. Stage 2 would be regraded, filled with clean imported Virgin Excavated Natural Material (VENM) and/or Excavated Natural Material (ENM) which would be placed in accordance with detailed physical barrier design and geotechnical requirements. Erosion and sediment controls would be in place during construction in accordance with *Civil Drawings*.

The remediation would be undertaken as described in the RAP (refer to **Appendix H** and **Chapter 9** for further information) and would generally involve filling of the Stage 2 area of the Site with VENM and/or ENM with materials appropriately placed and compacted. This would be designed to provide a physical barrier to ACM.

A detailed physical barrier design would be required prior to implementation of the remedial approach which takes into consideration specific building engineering requirements.

5.5.2 Industrial Warehousing Facility

Stage 2 of the Industrial Warehousing Facility would involve development of new warehouse and office buildings, hard stand areas, car parking and landscaping areas on the south eastern side of the Site, (east of the unformed Nant Street) as shown in the *Architecture Drawings*.

The development would be undertaken in stages to provide a total floor space area of approximately 16,490 m^2. Delivery of the proposed buildings on Stage 2 is to be staged dependent upon market requirements.

The warehouses would be metal clad or precast exterior finishes, with the roof ridge height up to 14 m. Six new buildings (Warehouses 7-13) are proposed similar in style to the Stage 1 buildings, generally positioned to front McPherson Street or a new internal entry driveway. Each building would have

integrated office space. Roller shutters, storage and hardstand areas are located generally to the rear of the development away from the street frontage. The Project allows for a café / amenity area to service the development. The development has been designed to achieve the necessary setbacks described in **Chapter 6.**

The detailed design of the Facility would incorporate vapour intrusion mitigation measures for Site structures as necessary.

The completed development is presented on **Figure 5-4** and is proposed to have the characteristics described in **Table 5-3**.

Table 5-3 Stage 2 Development Characteristics

Component	Characteristics
Total warehouse	14,850 m^2
Total office	1,400 m^2
Café/Amenity	240 m^2
Total Facility	**16,490 m^2**
Car parking	*260 spaces*

Water and energy efficiency measures would be incorporated into the development as described in **Appendix R**. Detention basins (both in ground and open dry basins adjoining Springvale Drain) are included and detailed design of these would consider the requirements of the Southlands RAP. Detailed design of Stage 2 drainage infrastructure would incorporate measures to mitigate potential scouring and sediment impacts at Penrhyn Estuary.

Building and business identification signs would be incorporated into the design of the building.

Details demonstrating full compliance of the development with relevant BCA provisions would be provided with the Construction Certificate documentation, as is normally required.

Connection would be made to the access road into the Site from McPherson Street created in Stage 1.

Landscaping for Stage 2 would use indigenous species common to the area and would be in accordance with the *Landscape Plans.*

5.5.3 New Link Road

As a part of the Stage 2 works, a major new road link is proposed to create new road access and traffic capacity between Botany Road and McPherson Street through the existing Discovery Cove Estate and former MCS site.

The New Link Road works are subject to acquisition of land rights and would involve:

- traffic signals at the intersection of the New Link Road and Botany Road;
- left turn slip lane for east-bound Botany Road traffic entering the New Link Road;
- left turn slip lane for east-bound Botany Road traffic exiting the New Link Road;
- two lanes in each direction through to the Discovery Cove Estate with a dividing median along this length;

- one lane in each direction in the portion north of the Discovery Cove Estate;
- access to the Discovery Cove Estate on both sides of the New Link Road would be via left-in and left-out movements with a central median along the new road;
- new roundabout at the intersection of the new road with McPherson Street;
- reconfiguration of existing buildings within the Discovery Cove Estate; and
- reconfiguration of parking, access and vehicular circulation within the Discovery Cove Estate.
- The road is proposed as a public road and therefore would be dedicated to form part of the public road system.

Crossing of the SWSOOS would require further more detailed design and approval from Sydney Water.

The alignment of the New Link Road is presented in **Figure 5-5**.

Further contamination investigations would be undertaken for the New Link Road Site and a remedial approach developed.

Reconfiguration of Discovery Cove

Construction of the New Link Road requires reconfiguration of the Discovery Cove Estate to accommodate the New Link Road and to reconfigure the existing single estate into two separate estates. The following works would be conducted as part of the reconfiguration (refer to **Figure 5-5**):

- Site 1 (western side of Discovery Cove):
  - remove 20 car spaces for truck maneuvering, loading and unloading adjacent to Unit 20;
  - demolish Unit 20 and relocate existing plant room;
  - construct new two level car-parking deck providing 186 car spaces in place of Unit 20; and
  - relocate existing mobile phone tower.
- Site 2 (eastern side of Discovery Cove):
  - demolish Unit 8; and
  - construct new car-park consisting of 74 car spaces in place of Unit 8.

The completed development is proposed to have the attributes described in **Table 5-4**.

Table 5-4 Reconfigured Discovery Cove Characteristics

Component	Area (m^2)
Total Existing Site Area	75,790
Proposed New Road	4,245
Site 1	36,710
Proposed Car parking	*393 spaces*
Site 2	34,835
Proposed Car parking	*266 spaces*

5.5.4 Drainage Infrastructure

In accordance with the stormwater and flood assessment (refer to **Chapter 8** and **Appendix G**) drainage infrastructure is required to resolve flooding issues in the local catchment prior to the development of the Stage 2 area. Incorporation of these measures would therefore allow the development of Stages 2 and 3 without any flood impact on adjoining properties.

The following drainage infrastructure would be constructed / upgraded in tandem with the New Link Road (refer to **Figure 5-6**):

- enlarging the culverts in Stage 1 under the New Link Road crossing of Springvale Drain;
- constructing new culverts under McPherson Street and the new roundabout;
- constructing additional culverts running in tandem with the New Link Road between McPherson Street and the SWSOOS;
- constructing an additional siphon (or some other structure to increase flow capacity) under the SWSOOS;
- constructing new culverts in tandem with the New Link Road through Discovery Cove to the new intersection at Botany Road; and
- constructing a new road crossing for new culverts under Botany Road to connect with the existing open channel at the Caltex property that forms the effective entry to the Penrhyn Estuary (Botany Bay).

Detailed design of Stage 2 drainage infrastructure would incorporate measures to mitigate potential scouring and sediment impacts at Penrhyn Estuary. Further detailed design of these measures would be provided at Construction Certificate stage.

5.6 Stage 3

Information is provided on Stage 3 for information purposes only. Approval is not being sought in this application for Stage 3.

Stage 3 involves development of the north eastern side of the Site (east of the unformed Nant Street and north of the Stage 2 area) for a commercial / warehousing facility and would not be developed until an adequate remediation strategy is developed for the groundwater contamination source areas at this location.

The development is proposed to provide a total floor space area of approximately 15,750 m^2 comprising development of new warehouse and office buildings, hard stand areas, car parking, detention basin and landscaping areas accompanying drawings for the north eastern side of the Site (east of the unformed Nant Street). Delivery of the proposed buildings on Stage 3 is to be staged dependent upon market requirements and an appropriate remediation strategy.

The completed development is proposed to have the characteristics described in **Table 5-5** and shown for indicative purposes only in **Figure 5-4**.

Table 5-5 Stage 3 Development Characteristics

Component	Characteristics
Total warehouse	14,350 m^2
Total office	1,400 m^2
Total Facility	**15,750 m^2**
Car parking	*120 spaces*

5.7 Operating Hours and Staffing

This estate would operate 24 hours a day, 7 days a week. Staffing / employment numbers have been estimated at some 310 persons for construction of the three stages and 760 for operation.

Project Staging and Construction

The total remediation and construction cost of the development would exceed $130 million.

Construction for Stage 1 of the Project would likely commence once Project Approval is granted. The estimated duration of construction is 18 months for Stage 1. Peak truck visitation would occur during the initial nine month period when the Site would be filled. The timing for Stage 2 is works is dependant on tenant demand for warehousing facilities and has not yet been confirmed. The New Link Road would be constructed as part of the Stage 2 works.

Construction hours would be in accordance with the Conditions of Approval. It has been assumed for the purposes of this Environmental Assessment that construction will occur within the applicable hours of the NSW Environmental Noise Control Manual noise design goals i.e. between the hours of 7.00 am and 6.00 pm Monday to Friday, and 8.00 am to 1.00 pm Saturdays. It is noted that the NSW Environmental Noise Control Manual does not preclude works outside this time but that for all other times construction noise must be inaudible at the receiver.

Planning and Legislative Requirements Chapter 6

6.1 Introduction

This chapter considers the consistency of the proposal with relevant Commonwealth, State and Local Planning Instruments, including the planning approval process, strategic plans, applicable guidelines and development standards.

6.2 Commonwealth Legislation

6.2.1 Environment Protection and Biodiversity Conservation Act 1999

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) requires the approval of the Commonwealth Minister for the Environment, Water, Heritage and the Arts for any action that may have a significant impact on matters of national environmental significance. The EPBC is administered by the Department of the Environment, Water, Heritage and the Arts (DEWHA).

The definition of "environment" under the EPBC Act includes:

(a) ecosystems and their constituent parts, including people and communities; and

(b) natural and physical resources; and

(c) the qualities and characteristics of locations, places, areas; and

(d) heritage values of places; and

(e) the social, economic and cultural aspects of a thing mentioned in paragraph (a), (b) or (c).

The reference to places in paragraph (d) above include places included in the Register of the National Estate kept under the Commonwealth *Australian Heritage Council Act 2003*.

The EPBC Act identifies seven matters of National Environmental Significance (NES):

- World Heritage properties;
- National heritage places;
- Wetlands of international importance (Ramsar wetlands);
- Threatened species and ecological communities;
- Migratory species;
- Commonwealth marine areas; and
- Nuclear actions (including uranium mining).

The NES which may be potentially affected by the Project include any significant impact on a listed threatened species, ecological communities and migratory species and places on the Register of National Estate.

The proposed Site is not a listed place on the Register of National Estate or heritage listings maintained by DEWHA.

Chapter 6 Planning and Legislative Requirements

The Green and Golden Bell Frog is listed as 'vulnerable' under the EPBC Act and 'endangered' under the National Parks and Wildlife Act 1997. An assessment of the Green and Golden Bell Frog conducted as part of this Environmental Assessment (refer to **Appendix O**), addressed the requirements under the EPBC Act. The assessment recommends offset habitat of two small perched ponds and provides additional detail on recommendations for the ponds. These mitigation measures ensure no net adverse impact on the species. There are no threatened species or communities that will be significantly impacted by the Project. Issues associated with the impact on threatened species are discussed further in **Chapter 14** of this Environmental Assessment.

6.3 New South Wales Legislation

6.3.1 Contaminated Land Management Act 1997

The general objective of the *Contaminated Land Management Act 1997* (CLM Act) is to establish a process for investigating and (where appropriate) remediating land areas where contamination presents a significant risk of harm to human health or some other aspect of the environment.

The Environment Protection Authority has declared Orica land at BIP to be a remediation site under Section 21 of the CLM Act. The Southlands portion of the Site is within the declared remediation site. The nature of the contamination identified in the declaration relates to the presence of elevated levels of various organic contaminants in groundwater and/or soil. Particular reference is made to volatile and semi-volatile chlorinated hydrocarbons. A remediation order under Section 23 of the CLM Act has not been issued and Orica has initiated an intensive programme to remediate the groundwater within the remediation site. Orica will continue to be responsible for the ongoing groundwater contamination and its remediation.

In accordance with Section 53 B of the CLM Act, a Site Audit of the Southlands Site and the Southlands RAP by a NSW DECC accredited Site Auditor has been commissioned. At the conclusion of a Site Audit a Site Audit Report and a Site Audit Statement are prepared. These provide a written opinion by the Site Auditor. Two types of Site Audit Statements (Section A or Section B) can be prepared.

In a Section A Site Audit Statement, the auditor may conclude that the land is *suitable* for a specified use(s) OR *not suitable* for any beneficial use due to the risk of harm from contamination.

By certifying that the Site is *suitable*, an auditor declares that, at the time of completion of the site audit, no further remediation or investigation of the site was needed to render the site fit for the specified use(s). This may include conditions.

In a Section B Site Audit Statement, the auditor draws conclusions on the nature and extent of contamination, and/or suitability of plans relating to the investigation, remediation or management of the land, and/or whether land can be made suitable for a particular land use or uses upon implementation of a remedial action or management plan.

By certifying that a site *can be made suitable* for a use or uses if remediated or managed in accordance with a specified plan, the auditor declares that, at the time the audit was completed, there was sufficient information satisfying guidelines made or approved under the CLM Act to determine that implementation of the plan was feasible and would enable the specified use(s) of the site in the future. For a Section B Site Audit Statement, conditions may be specified by the auditor.

Appendix I presents the Section B Site Audit Statement issued for the Southlands RAP. A Section A Site Audit Statement would be obtained for each Stage of the Project upon completion of the necessary remediation works and prior to the construction of buildings.

6.3.2 Protection of the Environment Operations Act 1997

The *Protection of the Environment Operations Act 1997* (POEO Act) regulates activities and installations that have the potential to cause environmental harm as a result of their operations. The POEO Act provides for the preparation and implementation of environmental protection policies, pollution prevention and control, and the licensing of prescribed activities and development. The Project does not require an Environment Protection Licence under the POEO Act, however, existing Orica Environment Protection Licences in relation to the remediation of groundwater will continue in force.

As discussed in **Chapter 2** the DECC issued Orica with an NCUA (No. 1030236 on 26 September 2003), under the POEO Act 1997, which affects the Southlands Site. Several variation notices have subsequently been issued.

Orica has initiated large scale remedial measures consisting of hydraulic containment in conjunction with pump and treat technologies. The proposed remediation and development of the Southlands Site has been planned and is proposed to be staged in a manner that will allow Orica to meet its environmental obligations. Such obligations include:

- performing further investigations and trialling removal technologies for groundwater contaminant source areas beneath Stage 3 prior to development of Stage 3;
- maintaining the GTP throughout, and following, implementation of the Southlands Remediation and Development Project in accordance with the terms of the NCUA or other regulatory requirements;
- allocating corridors for potential future in-situ remedial technologies; and
- maintaining access to the Site for purposes of monitoring and investigations works following the development and divestment of the Site.

Consideration of Orica's groundwater remedial obligations has been paramount in the development of the Project Application, and the timing of its implementation. In addition to groundwater contamination issues, soil and vapour remedial measures have been identified as matters to be dealt with in the RAP prior to the commencement of the development works. These works are outlined in **Chapters 5, 9, 10, 11** and **Appendix H** of this Environmental Assessment.

6.3.3 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act) and the *Environmental Planning and Assessment Regulations 2000* (EP&A Regulations) provide the statutory basis for land use planning in New South Wales. Part 3A of the EP&A Act provides a comprehensive scheme for the assessment of projects which are declared to be of state and regional environmental planning significance.

Some relevant aspects of Part 3A of the EP&A Act are:

Environmental assessment requirements for a project are prepared by the Director-General for Planning (S75F).	A copy of the Director-General's Environmental Assessment Requirements for this Project is contained in **Appendix A.**
Parts 4 and 5 of the EP&A Act do not apply to a Part 3A project (S75R).	The Minister may (but is not required to) take into account the provisions of any environmental planning instrument (S75J). The proposed project is a form of development that is permissible under the Botany *Local Environmental Plan 1995.*
Certain authorisations are not required by an approved Part 3A project (S75U).	Authorisations are not required for: • Investigation permit; consent to destroy relics – *National Parks and Wildlife Act 1974*; • A Part 3A approval – Rivers and Foreshores Act, 1948; • A bush fire safety authority – *Rural Fires Act 1997*; or • A water use approval, water management works or activity approval – *Water Management Act 2000.*
Certain authorisations cannot be refused if it is necessary for carrying out an approved project and authorisation required must be substantially consistent with the approval (S75V).	The following xauthorisations are subject to this provision: • An environmental protection licence under Chapter 3 of the *Protection of the Environment Operations Act 1997*; and • A consent under Section 138 of the *Roads Act 1993*. • A licence under the *Pipelines Act 1967.*

6.4 New South Wales Planning Policies and Strategic Plans

The following State environmental planning instruments and strategic plans are relevant to this Project.

6.4.1 State Planning Policies

State Environmental Planning Policy No. 33 – Hazardous and Offensive Development

State Environmental Planning Policy No. 33 – Hazardous and Offensive Development (SEPP 33) aims to identify proposed developments with the potential to be either hazardous or offensive. A development is defined as potentially hazardous and/or offensive (odour, dust etc) if, without mitigating measures in place, the development would pose a significant risk to the locality in terms of human health, life or property; or the biophysical environment.

The current proposal is for warehouse and ancillary offices and only small quantities of potentially dangerous goods and materials are expected to be stored on-site. The requirements of the Policy are considered in **Chapter 17** and **Appendix P** of this Environmental Assessment.

State Environmental Planning Policy No. 55 – Remediation of Land

State Environmental Planning Policy No. 55 – Remediation of Land (SEPP 55) was introduced in 1998 to provide a state-wide planning approach to the remediation of contaminated land. In particular, SEPP 55 defines remediation as either Category 1 or Category 2. Remediation defined as Category 1 requires development consent, while remediation defined as Category 2 does not require development consent.

As Part 3A of the EP&A Act applies to the Southlands Project, the consent requirements of SEPP 55 are not considered further here.

State Environmental Planning Policy No. 64 – Advertising and Signage

State Environmental Planning Policy No. 64 – Advertising and Signage (SEPP 64) seeks to ensure that any signage associated with a development, including any advertisement, that is visible from a public place is compatible with the desired amenity and visual character of an area, is suitably located and is of a high quality and finish.

In the current project the only signage proposed involves *building identification signs* and *business identification signs* as defined in the Policy. Clause 9 of the Policy provides that an assessment of matters identified in Schedule 1 is not required for *building identification signs* and *business identification signs*.

Draft State Environmental Planning Policy No. 66 – Integration of Land Use and Transport

The Draft State Environmental Planning Policy No. 66 – Integration of Land Use and Transport (SEPP 66) is designed to apply to any development having a gross floor space of more than 1,000 m^2. The aims of the Policy are to ensure that urban structure, building forms, land use locations, development designs, subdivision and street layouts help achieve the following planning objectives:

a) improving accessibility to housing, employment and services by walking, cycling and public transport,

b) improving the choice of transport and reducing dependence solely on cars for travel purposes,

c) moderating growth in demand for travel and distances travelled especially by car,

d) supporting the efficient and viable operation of public transport services,

e) providing for the efficient movement of freight.

The Site is ideal for the proposed development because of local considerations (established serviced industrial area, existing road system, and public transport routes) and regional factors (proximity to Port Botany and Kingsford Smith International Airport, and access to the M5 Motorway).

The development of this Site, as proposed, would assist in achieving the above objectives, particularly (a) because of its relative proximity to residential areas in Eastern Sydney and (e) through the efficiencies gained in the movement of freight.

Chapter 6 Planning and Legislative Requirements

State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Infrastructure) 2007 includes a provision through clause 104 of the Policy that deals with traffic-generating developments. The purpose of the clause is to ensure that such developments are brought to the attention of the Roads and Traffic Authority (RTA).

The proposed type of development falls within the provisions of the Policy, being industrial development of greater than 20,000 m^2 and / or having ancillary accommodation for 200 or more motor vehicles, or the enlargement or extension of a parking area where the enlargement or extension accommodates 200 or more motor vehicles.

The RTA has been consulted during the development of this Project and an assessment of the impact of the project on roads and traffic is included in **Chapter 12** of this Environmental Assessment.

State Environmental Planning Policy (Major Projects) 2005

The Major Projects SEPP identifies projects of State or regional planning significance that are of a kind that the approval and assessment process under Part 3A of the Act should apply.

Clause 12 within the Group 4 class of development in Schedule 1 of the Major Projects SEPP declares that development for the purpose of container storage facilities, or storage or distribution centres, with a capital investment value of more than $30 million are Part 3A projects. The Minister for Planning has formed the opinion that Part 3A of the EP&A Act applies to the proposed Southlands Remediation and Development Project. Consequently the Minister is the approval authority for the Project Application.

6.4.2 Local Planning Instruments

The Site is within the Local Government Area of CoBB. In this area the local planning instrument is the Botany Local Environmental Plan 1995 (BLEP).

The Site is located within the Botany 4(a) Industrial Zone under the BLEP. In this zone a wide range of industrial uses are permissible with consent including container terminals, warehouses and distribution centres. Subdivision is also permissible with consent. The proposed use for the Site is for a major warehouse and industrial estate which is permissible with consent.

Clause 12 of BLEP contains a development standard for floor space ratios (FSR). In the 4(a) Industrial zone the ratio of the gross floor area of the building to the site area of the land must not exceed 1:1. The FSR proposed for the Project is less than 0.8:1.

6.4.3 Local Planning Controls

Draft Botany Bay Strategic Planning Study

A draft Botany Bay Strategic Planning Study was initiated by CoBB to provide a framework for growth and development for Council's area over the next 25 years. The report titled: *Draft Botany Bay Planning Study 2031* was exhibited by CoBB in late 2008.

The draft Strategy Action and LEP/DCP controls for the Banksmeadow industrial area are described in **Table 6-1**.

Table 6-1 Relevant Objectives from Botany Strategic Planning Study

Action	Control	Timing
Objective 6.1.2 – Retain Banksmeadow (south) area for Port-related and other general industrial activities.	Establish an FSR of 0.8:1 Establish minimum lot size (o.6 ha) and restrict strata units	Short term

The current project complies in all respects with the relevant proposed actions and controls in the draft Strategy:

- The project is for an industrial use that is consistent with the function and character of the Banksmeadow (south area).
- The FSR proposed is less than 0.8:1.
- The land area is above the minimum lot size.
- Strata units are not proposed as part of this project.

City of Botany Bay DCP No. 33 for Industrial Development

The CoBB DCP No. 33 (CoBB, 2003) has been established to provide guidelines for new Industrial Development. It therefore contains controls and guidelines relating to:

- building design, height and form;
- traffic manoeuvring and parking; and
- the management issues associated with industrial development, relating to noise, traffic, odour and pollution.

The Site falls within the Banksmeadow Industrial Precinct of CoBB DCP No. 33. In preparing the Project design regard has been given to the objectives and controls in DCP No. 33.

6.4.4 Relevant Guidelines

In preparing the proposed plans for the Southlands Remediation and Development Project, regard has been given to the following State Government Technical and Policy Guidelines.

Air Quality	Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (DEC, 2005).
Built Form	Relevant BCA standards.
Noise	NSW Industrial Noise Policy (EPA 2000).
	Environmental Criteria for Road Traffic Noise (EPA).
	Noise Management – Assessing Vibration: a Technical Guideline (DECC, 2006).
Human Health	Environmental Health Risk Assessment: Guidelines for assessing human health risks from environmental hazards, (Department of Health and Ageing and EnHealth Council, Commonwealth of Australia, June 2002).

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Lighting	Control of Obtrusive Effects of Outdoor Lighting (Standards Australia, 1997 – AS 4282-1997).
Risk Analysis	Botany / Randwick Industrial Area Land Use Safety Study (2001).
	Port Botany Land Use Safety Study (1996).
Soil and Water	Managing Urban Stormwater: Solis and Construction (Landcom).
	Australian and New Zealand Guidelines for Fresh and Marine Water Quality– ANZECC / ARMCANZ, 2000.
	All guidelines made or approved by the NSW EPA under Section 105 of the CLM Act 1997.
Traffic	Guideline to Traffic Generating Development and Road Design Guide (RTA).
	Relevant Austroad standards.
Waste	Waste Classification Guidelines: Part 1 Classifying Waste (DECC,NSW, 2008).

Best practice for industrial / warehouse distribution centre developments throughout the Sydney Metropolitan Area in recent years have achieved the following standards which are relevant across Sydney and also to the CoBB:

Building Design

- High quality design of industrial buildings which address the primary frontage with integrated offices.
- Extensive use of articulation, materials and colour to enliven the development.
- Roller shutters, storage and any extensive hardstand areas located to the rear of the development.
- Energy efficiency and rainwater harvesting initiatives incorporated into the design.

Height

Generally 12 m but individual buildings may be as high as 30-40 m depending on end user requirements.

Landscaping

- Up to 15 % of Site area provided with soft landscaping at ground level.
- Provision of staff amenities in landscaped areas with adequate solar access.
- Extensive use of indigenous species common to the area.

Setbacks

- Front setback subject to the width of road – generally 12.5 m to 20 m
- Side and rear setback 3 m.
- First 3- 5 m of building setback to be landscaped
- Averaging provisions encouraged to improve streetscape.

Signage

- Building and business identification signs incorporated into the design of the

building.

Site Cover

- 60 % of Site area. Definition of Site cover generally includes awnings.

The manner in which the Project addresses the above standards is further considered in **Chapter 5** of this Environment Assessment.

6.5 Section 94 Contributions

An assessment has been undertaken to determine contributions required to be made under Section 94 of the EP&A Act and the current Section 94 Contributions Plan of CoBB. The assessment reviewed the Material Public Benefits associated with the development and the developer contributions that may ordinarily be sought for the provision of facilities and services in association with the development of the Project. The assessment was conducted by Connell Wagner and the complete assessment is presented in **Appendix D**.

As a conclusion to the review, it was noted that the need for additional facilities and services is often a consequence of development. Such facilities and services are normally provided by the relevant Council through the application of Section 94 Contributions Plans where they are required to serve more than one development.

As the Minister will be the determining authority of this Project, the legislation provides scope for the Minister to determine applicable Section 94 contributions, together with other conditions of consent, without a requirement to be strictly bound by CoBB's existing Section 94 Contributions Plan.

The Material Public Benefits proposed by the Southlands development are considered significant and should be taken into account when the consent is determined.

The Material Public Benefits include:

- Upgrade works to local roads and intersections in Stage 1, including:
  - upgrade works to the Hills and Exell Street intersections with Botany Road; and
  - potential improvements to Botany Road to increase its capacity and remove various "bottle neck points" involving closure of the Discovery Cove roundabout, improved turning movements at the Botany Foreshore Road intersection and the introduction of a new all turn entry into Discovery Cove. These works have been identified following community consultation and will deliver improvements to the local traffic conditions and are offered in lieu of Section 94 contributions.
- A Stage 2 road connection from McPherson Street to Botany Road (New Link Road) to be provided prior to any development works on Stages 2 of the development.
- Proposed Stage 2 upgrade works to local stormwater infrastructure. A drainage solution has been developed that involves upgrades to existing stormwater channels / culverts along the New Link Road to improve capacity from the area back to Botany Bay. Full detailed design, in terms of pipe sizing and costing, is yet to be undertaken. The Material Public Benefits are far in excess of the Section 94 contributions that would reasonably be applied to the development, and meet the required contributions for both the total concept and the stages of the project. The review therefore made a number of recommendations based on the Material Public Benefits proposed in the various stages of works for the Project.

Chapter 6 Planning and Legislative Requirements

It is recommended that the Proponent, CoBB and benefiting stakeholders enter into a Voluntary Planning Agreement (or similar arrangement) to cover the staged delivery of the various Material Public Benefits in lieu of the required Section 94 contributions required for each stage of the development. Specifically the Voluntary Planning Agreement would address the following:

- **Stage 1:** To secure the delivery of the Stage 1 Material Public Benefits as works in kind and make no further contribution to the Council or the RTA for Stage 1 in recognition of those Material Public Benefits, and in particular the various upgrades to the Hills and Exell Street intersections with Botany Road, plus the possible improvements to Botany Road.
- **Stage 2:** To recognise the Stage 2 works in kind in the form of the New Link Road, plus local area stormwater infrastructure improvements and make no contribution to CoBB or the RTA.

The review noted, significantly, that the commencement of Stage 2 would be conditional on:

- CoBB adopting the New Link Road under its Section 94 Plan in lieu of the current road proposal for the precinct;
- CoBB and the Proponent entering into a suitable Voluntary Planning Agreement (or similar arrangement) for the co-development of the New Road Link and the additional drainage infrastructure proposed from Stage 2; and
- Contributions by both the relevant landowners in the precinct and by CoBB (in respect of Section 94 contributions already in hand) towards the cost of the New Link Road and the additional drainage infrastructure proposed for Stage 2.

The Proponent therefore seeks to work with CoBB and other benefiting stakeholders to develop and enter into a Voluntary Planning Agreement (or similar arrangement) to cover the staged delivery of the various Material Public Benefits in lieu of the required Section 94 contributions required for each stage of the development.

To this end, preliminary discussions with CoBB have indicated that CoBB would review the road option and consider if the New Link Road and the associated drainage works could be included in the CoBB Section 94 Plan.

Community & Stakeholder Engagement | Chapter 7

7.1 Stakeholder Identification

In accordance with the Environmental Assessment Requirements (refer to **Appendix A**), consultation for the project has targeted the following groups:

- NSW Department of Environment and Climate Change;
- NSW Department of Water and Energy;
- NSW Department of Health;
- Council of the City of Botany Bay;
- Randwick City Council;
- Botany Environment Watch;
- Botany Bay and Catchment Alliance;
- other community and environment groups; and
- the local community.

Using the Botany Transformation Projects community relations database, Orica has established a "Southlands Interest Group" contact list. This contact list includes and expands upon the above list capturing any organisations, businesses and individuals who have expressed an interest in the project to date. This contact list is dynamic and is regularly updated in response to feedback from interested parties.

7.2 Consultation Approach & Tools

Consultation for the Project has been led by Orica on behalf of the project proponents. Orica coordinates a comprehensive community relations program for the Botany Transformation Projects and has specific community groups which meet regularly to discuss aspects of the various cleanup and remediation projects that Orica has underway at Botany.

Orica supports an open and transparent approach to community relations and greatly values the feedback and commitment provided by interested residents, businesses and community groups in the Botany area.

Communication tools utilised for this Project include:

- targeted meetings – with specific agencies or groups to discuss particular aspects of the project;
- public workshops – to share progress of project planning and to seek feedback from community and industrial neighbours – topics for the workshops were identified in response to community feedback;
- local newspaper columns – to share information about project plans and to advertise public workshop sessions;
- 1800 number – to receive queries and feedback from any parties interested in the project; and
- invitations to public workshops and completed workshop reports are issued to all contacts on the "Southlands Interest Group" list.

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A project webpage (http://oricabotanytransformation.com/) has been developed for the Southlands project and would be updated as the Project proceeds. This webpage has been used to facilitate access to workshop presentations and reports, to advertise consultation opportunities and to provide an e-mail contact function going forward.

7.3 Consultation during Preparation of the Environmental Assessment

Table 7-1 provides a summary of the consultation activity undertaken during development of the Environmental Assessment, key issues raised and where they are addressed within the Environmental Assessment.

Table 7-1 Consultation during preparation of the Environmental Assessment

Stakeholder	Form of Consultation	Date	Key Issues Raised by Stakeholder	Where Issues Addressed in Environmental Assessment
STATE GOVERNMENT				
Department of Planning (DoP), DECC, Department of Health, CoBB and RTA	Planning Focus Meeting.	4 August 2006	Reflected in Director-General's Requirements issued by DoP.	Throughout EA (refer to **Section 1.7**).
DoP	A number of specific meetings have been held to brief the DoP on the proposal and to discuss the statutory approach and development of the EA. DoP has been invited to, and attended, public workshops.	Various	DoP recommended that a Project Application for staged works be sought rather than submitting a Concept Plan Application (as had originally been intended).	The proponent agreed and has submitted a Project Application for Stages 1 and 2 as outlined throughout this EA.
			DoP has encouraged regular contact with the DECC throughout the process of developing the outcome for the Site.	Regular meetings have been held with the DECC to update them on the project as it has progressed. See below.
DECC	Chris Jewell has been appointed as the independent NSW EPA accredited auditor for the Southlands and Remediation Development Project. In this role Chris Jewell acts as an independent representative of the DECC for the project. The proponent has held regular meetings with Chris Jewell during the development of the project RAP. In addition, Orica has had a number of specific meetings with the DECC to brief the Department on the proposal and to outline how remediation matters will be addressed. A focus of these meetings has been on the requirements for Orica's ongoing groundwater remediation works.	Various	DECC provided specific requirements for the EA which are attached to the Director-General's Requirements issued by the DoP.	Refer to **Section 1.7** for an overview of where the specific Director-General's Requirements are addressed.

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Stakeholder	Form of Consultation	Date	Key Issues Raised by Stakeholder	Where Issues Addressed in Environmental Assessment
NSW Department of Health (DoH)	A NSW Health contact has been included on the Southlands Interest Group and has been sent information about consultation opportunities and project updates during development of the draft EA. The methodology used for the project Human Health Risk Assessment (HHRA) is consistent with that applied to other recent Orica projects at Botany. This methodology has been previously approved by NSW Health.	Various	No specific feedback received during preparation of the EA.	
Department of Water and Energy (DWE)	Orica has briefed DWE on the Southlands Project and corresponded with the Department in relation to the riparian zone along Springvale Drain.	April – May 2007	DWE wrote to Orica on 2 April 2007 noting the following matters:	
			Any new groundwater works not already approved are to be referred to DWE.	Approval would be sought from DWE for any new extraction bores – this is to be arranged by Orica separately to the approvals process for the Southlands Project.
			Rainwater can be harvested without a water licence approval.	**Chapter 20** – Water and Energy Efficiency
			Proposal presents a good opportunity to improve the environmental functionality and aesthetics of Springvale Drain with sympathetic design and riparian planting's along a 10 m wide corridor on either side of the drain.	**Chapter 5** – Project Description **Chapter 8** – Flooding and Hydrology **Chapter 19** – Landscape and Visual Impact

Stakeholder	Form of Consultation	Date	Key Issues Raised by Stakeholder	Where Issues Addressed in Environmental Assessment
RTA	A number of meetings have been held with the RTA to discuss the traffic modelling approach. RTA has been invited to public workshops and has declined invitations on the basis that a final Application is yet to be lodged and received by them.	Various	The RTA provided requirements for the EA (dated 29 August 2006) which are attached to the Director-General's Requirements issued by the DoP.	Refer to **Section 1.6.1** for an overview of where the specific Director-General's Requirements are addressed.
			Meetings were held with RTA representatives to discuss and review road modelling criteria and access road options. Detailed discussions on the proposed new entry road and the intersection configuration were also held. Specific details were not resolved with RTA noting that details would need to be sorted out at the detailed design stage.	**Chapter 12** – Traffic and Transport
Department of Lands (DoL)	DoL currently owns Springvale Drain that divides the two Southlands blocks. A meeting was held to discuss the proposal, their owners consent and the potential purchase that section of Springvale Drain.	November 2006	DoL has indicated no objection to the proposal and have provided owners consent. DoL has also offered to sell this section of the drain and the proponent will enter into discussions with them and consider this offer.	**Chapter 2** – Site Location and Context
Sydney Ports Corporation (SPC)	Specific meetings have been held with SPC regarding shared considerations such as local traffic improvement plans.	September 2007	SPC noted continuing interest in traffic issues for the area as they review traffic improvement options for the Port. The Proponent has met with SPC on two occasions to present and discuss the traffic measures proposed in the current Application.	**Chapter 12** – Traffic and Transport

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Stakeholder	Form of Consultation	Date	Key Issues Raised by Stakeholder	Where Issues Addressed in Environmental Assessment
LOCAL GOVERNMENT				
City of Botany Bay Council (CoBB)	A number of specific meetings to brief Council on the proposal, seek land owners consent for Nant Street works, discuss local traffic issues and potential solutions etc. CoBB has been invited to and attended public workshops.	Various	CoBB provided requirements for the EA (dated 4 September 2006) which are attached to the Director-General's Requirements issued by the DoP.	Refer to **Section 1.6.1** for an overview of where the specific Director-General's Requirements are addressed.
			Issues discussed with Council include: • Owners Consent – Council has agreed to the sale of the unformed Nant Street. Council advises that the closure of Nant Street and its offer for sale to the adjoining landowners is currently underway; and • Local traffic issues – Meetings have been held with Council to discuss and review local traffic works proposed as part of the Application.	**Chapter 12** – Traffic and Transport **Chapter 2** – Site Location and Context.
			Specific matters raised at workshops are addressed in the various workshop reports provided at **Appendix C**.	
Randwick City Council	Randwick City Council has been invited to public workshops.	N/A	Randwick Council has not attended the project workshops or raised any specific issues regarding the Project to date.	

Stakeholder	Form of Consultation	Date	Key Issues Raised by Stakeholder	Where Issues Addressed in Environmental Assessment
LOCAL ENVIRONMENT GROUPS (including the Botany Bay and Catchment Alliance (BBACA) and Botany Environment Watch (BEW)). SITE NEIGHBOURS AND THE LOCAL COMMUNITY – CONSULTATION VIA PUBLIC WORKSHOPS (advertised in local papers, through community contacts and with flyers distributed in the local area for some workshops)				
Local community	Public Workshop - General Briefing on the Botany Transformation Projects including presentations on the proposed remediation and development of Southlands. Contacts who expressed interest in the Southlands remediation and development project at this workshop formed the first draft of the Southlands Interest Group.	17 June 2006	Past, current and possible land use and zoning of the land.	**Chapter 4** – Alternatives to the Project, **Chapter 6** – Planning and Legislative Requirements
			Time required to cleanup the groundwater and surface soil. Extent of contamination, differentiation between groundwater and surface water contamination. Process for cleaning up groundwater and surface soil.	**Appendix H**– RAP
			Environmental planning legislation process.	**Chapter 6** – Planning and Legislative Requirements and this chapter.
			Impacts on traffic conditions, including the proposed road link from McPherson Street to Botany Road. If consideration has been given to rail transport to the Site.	**Chapter 12** and **Appendix L** - Traffic and Transport
			If the proponent intends to use sustainable energy/recycling initiatives.	In response to this feedback Connell Wagner was engaged to prepare the report presented as **Appendix R**.
Southlands Interest Group and wider community	Public Workshop – Update on the Botany Transformation Projects including presentations on the following aspects of the Southlands project: • traffic impacts and mitigating measures; • flora, fauna and heritage issues;	19 and 22 August (repeat session) 2006	How can you predict that the easements for the project will be adequate for what might be required in the future?	Easements have been sized conservatively based on an extensive knowledge of groundwater and Site issues. The Stage 3 area is not proposed for development at this stage and would be subject to future approvals.

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Stakeholder	Form of Consultation	Date	Key Issues Raised by Stakeholder	Where Issues Addressed in Environmental Assessment
	• the contamination at the site and how it is being managed; • the Remediation Action Plan; and • the timeline for the project.		Will the traffic model be prepared for optimum use?	**Chapter 12** and **Appendix L** - Traffic and Transport
			Could vapours from the groundwater contamination come up through the floor of the development and pose a health impact?	**Appendix H** – Southlands RAP (which includes the HHRA)
Southlands Interest Group and wider community	Public Workshop – Southlands. Presentations made on: • Site Master Plan; • traffic management studies; • the RAP and HHRA; • flooding and stormwater management investigations; and • eco-efficiency design features.	27 February 2007	Refer to the detailed workshop reports provided in **Appendix C**. Local traffic concerns were highlighted as a key issue at this workshop. This led to the round table discussion reported below.	
Southlands Interest Group	Round table discussion on traffic considerations for the Southlands project	3 May 2007	Refer to the detailed workshop reports provided in **Appendix C**.	
Southlands Interest Group and wider community	Public Workshop – Southlands. Presentations on: • Flooding and Stormwater Management Investigations • Update on proposed Remediation Action Plan • Green and Golden Bell Frog Assessment	9 August 2007	Refer to the detailed workshop reports provided in **Appendix C.** At this workshop BBACA asked Orica to consider setting aside part of the Southlands Site for an environmental project. Similar feedback was raised in an e-mail from a BBACA member to Orica in May 2007 and has also been reflected in feedback from some other community members during development of the project. It has been suggested that Orica should consider utilising part of the land for an environmental project. Orica has responded to this feedback by advising that the company is not in a position to set aside part of the Southlands Site. Orica is seeking a financial return from the Southlands project. Providing this return, at the same time as enabling the ongoing groundwater cleanup works, is Orica's primary objective for the project. It is noted the area along Springvale Drain will include small Green and Golden Bell Frog Pond habitats.	

Stakeholder	Form of Consultation	Date	Key Issues Raised by Stakeholder	Where Issues Addressed in Environmental Assessment
Southlands Interest Group	Letter providing a project update and details of proposed workshop in January 2009.	17 December 2008		
Southlands Interest Group	Public Workshop – Southlands. Presentations on: • Project Overview and Status; • RAP. Site Auditor Presentation – Review of RAP and HRRA and preparation of site audit statement.	27 January 2009	Refer to the detailed workshop reports provided in **Appendix C.**	
INFORMATION SHARED WITH WIDER COMMUNITY				
General community	Project updates in Orica columns in Southern Courier and St George and Sutherland Shire Leader.	June 2006 – feedback from workshop on 17 June noting the Southlands project January 2007 – notification of upcoming workshops for the Southlands project March 2007 – feedback from the February Southlands workshop May 2007 – feedback from the May round table discussion on traffic. A map of the Southlands Site was included (following a community recommendation). Spelling of "Hills" Street corrected in response to community feedback on this column July 2007 – notification of Southlands workshop to be held in August August 2007 – feedback from August workshop January 2009 – advised draft EA with DoP for review & invitation to workshop. February 2009 – progress update & feedback from January workshop		
INFORMATION SHARED WITH THE BGC PROJECT COMMUNITY LIAISON COMMITTEE (CLC)				
CLC	Brief project updates have been provided at the quarterly CLC meetings since CLC members requested this in September 2008.	Matters raised at CLC meetings include requests for project updates, concern that the project is being assessed under Part 3A of the EP&A Act, concern that contamination would be capped and queries regarding the timing of community workshops.		

Chapter 7 Community & Stakeholder Engagement

Stakeholder	Form of Consultation	Date	Key Issues Raised by Stakeholder	Where Issues Addressed in Environmental Assessment
1800 and EMAIL FEEDBACK				
No specific feedback on the Southlands Remediation and Development Project has been received by Orica on the Orica Community Hotline (1800 025 138).				
A number of detailed e-mails have been received from a participant of the community workshops raising strong concern with the planned industrial use of the site, concern about traffic and stormwater impacts, asking what consideration has been given to climate change and making further suggestions that the site be set aside for an environmental project. Orica has offered to meet with this participant to discuss their concerns.				
COMMERICAL / INDUSTRIAL NEIGHBOURS				
Goodman	Involved in project planning	Various	Goodman has been involved in project planning and developing the staged approach for the development. Goodman has provided owners consent for the development.	
Qenos	Initial project briefing provided in February 2007. Qenos kindly provided access to their land for survey works required for flood study. Invited to public workshops.	Various	Need to maintain access to Qenos Nant Street Tank Farm and underground pipelines.	Access is maintained as shown in Site plans.
			Need to consider timing of works as bunding works underway at Nant Street Tank Farm in 2007.	No works by the proponent during that time (other than monitoring and site investigations), and as such no interference.
			Need to consider land use safety matters as adjacent to BIP and tank farms. Requested review of draft land use and safety report which was provided for review.	**Chapter 17** and **Appendix P** – Land Use Safety Planning
			Request that the flood modelling outputs recognise the bunds that exist around the tanks at the Nant Street Tank Farm to protect surface waters	**Appendix G** - Flooding Investigations

Stakeholder	Form of Consultation	Date	Key Issues Raised by Stakeholder	Where Issues Addressed in Environmental Assessment
Huntsman	Initial project briefing	February 2007	Interest in land use safety matters– requested review of draft report – this was provided for review.	**Chapter 17** and **Appendix P**– Land Use Safety Planning
Solvay Interox	Initial project briefing provided in November 2006 Invited to and attended public workshops Kindly provided access to their land for survey works required for flood study Sewer connection recommendation by Sydney Water briefly discussed	Various	Very concerned with local traffic management and current constraints at peak times.	**Chapter 12** and **Appendix L** - Traffic and Transport
			Keen to ensure no increased flood risk on their McPherson Street site	**Chapter 9** - Hydrology and Flooding and **Appendix G** Flood Investigations (no significant off-site flooding impacts will result from the proposal)
			The proponent has advised Solvay Interox of Sydney Water's recommendation to connect to the sewer main on their property. Solvay has identified potential constraints with this approach, and noted that amplification works may be required to meet capacity requirements. This would be investigated further following receipt of project approval.	Refer to **Appendix F** Infrastructure Services Report
MCS (it is noted that they have sold their site to a Goodman managed trust).	A number of specific meetings held regarding the proposed link road (MCS land is required for the road) Invited to and attended public workshops	Various	Owners consent was initially required for Stage 2 link road Interest in proposal and what it might mean for their land.	It is noted that this land is now owned by the Trust Company of Australia as custodian of the TGAI1 Property Trust (a Goodman managed trust). It is referred to in this EA as the former MCS land.
Gazal	Project briefings provided Invited to and attended public workshops	Various	Main interest is in traffic issues for the area and the difficulties experienced in the current situation, especially at peak hours.	**Chapter 12** and **Appendix L** - Traffic and Transport

Chapter 7 Community & Stakeholder Engagement

Stakeholder	Form of Consultation	Date	Key Issues Raised by Stakeholder	Where Issues Addressed in Environmental Assessment
Mobil	Notified of proposal as adjoining land owner Provided access for survey works required for flood study.	Various	No specific feedback	
OTHER ORGANISATIONS				
Sydney Water	Various discussion regarding the provisions of site services such as water and sewer connections.	Various	Sydney Water has outlined project requirements for water and sewer as discussed in the Civil Works and Services Section of **Chapter 5** - Project Description and **Appendix F** – Infrastructure Services Report	
RailCorp	Notified of proposal as adjoining land owner. Discussions held with Rail Corridor Management Group, RailCorp Botany Yard and the Australian Rail Track Corporation (ARTC).	October 2007	Rail Corridor Management Group have advised the proponent to consider general information on the RailCorp website regarding development near the rail corridor. They have also advised that the freight rail corridor adjacent to the BIP is planned to be transferred to the ARTC in 2008. RailCorp has also advised that a new infrastructure State Environmental Planning Policy is being drafted which will require development near infrastructure facilities to be notified to the operators of those facilities so that they can provide their requirements for the development assessment process.	
Pacific National	Notified of proposal as owner of part of the rail corridor located between Southlands and the BIP. Requested project briefing for relevant staff	October 2007	No specific feedback received during development of the EA.	

7.4 Commitment to Ongoing Consultation

Orica is committed to maintaining regular contact with the regulatory authorities, industrial neighbours, the local community and other interested parties during the assessment of the proposed Southlands Remediation and Development Project.

In accordance with environmental planning legislation, this Environmental Assessment will be on exhibition for a period of 30 days. Any submissions received during that period will be considered as part of the assessment process.

The Proponent would prepare a Communications Plan for the construction phase of the project (addressing requirements of the RAP for consultation during remediation works) to guide how community feedback can be best captured and responded to during each stage of the works and how information regarding project timeframes, progress and performance can be best shared with the local community. This plan would include:

- notifying site neighbours and the wider community of construction timing and progress;
- seeking feedback from interested stakeholders regarding the project and the level of information shared;
- reporting progress via Orica's monthly columns in the Southern Courier and St George and Sutherland Shire Leader newspapers; and
- maintaining project information on the Orica Botany Transformation Projects webpage.

Table 7-2 Summary of Consultation Measures

Mitigation Measure	Implementation		
	Design Stage	Construction and Remediation	Operation Stage
Preparation and implementation of Communications Plan to include • notifying site neighbours and the wider community of construction timing; • mechanisms for submitting feedback and asking questions regarding the Project; • reporting progress via Orica's monthly columns in the Southern Courier and St George and Sutherland Shire Leader newspapers; and • maintaining Project information on the Orica Botany Transformation Projects webpage.	✓ (Stage 1 and 2)	✓ (Stage 1 and 2)	

8.1 Introduction

Connell Wagner has undertaken a stormwater and flood assessment to develop a flood solution for the Site so that the Project does not create any adverse flooding impacts on adjoining lands. Numerical modelling was used to estimate likely flood levels for a range of rainfall events and site layout options and results were then assessed to determine the preferred option.

This chapter summarises the findings of the study. The full report is presented in **Appendix G**.

8.2 Existing Environment

Floodvale and Springvale Drains form the trunk drainage system for a catchment area of 319 ha, including residential, industrial and open space areas to the north of the Southlands Site. Flooding of Springvale and Floodvale Drains results from a complex interaction of catchment runoff coupled with flat terrain, drainage patterns associated with previous developments in the catchment and undersized drainage infrastructure. The Southlands Site, as the last large undeveloped site in the lower catchment, currently operates as a defacto flood storage area for other developed areas despite its current industrial zoning. Development of the Site is further complicated by shallow groundwater levels and groundwater contamination that limit options for transferring storage within the Site unless measures are adopted that address these issues.

Modelling was undertaken to simulate the 1% Annual Exceedance Probability (AEP) storm event for the existing situation. It showed flooding over much of the low lying areas of the Southlands Site and adjacent areas both upstream and downstream of the Site.

8.3 Assessment of Impacts - Construction

As noted in **Chapter 5**, erosion and sediment controls would be in place during construction in accordance with the *Civil Drawings*.

8.4 Assessment of Impacts - Operation

8.4.1 Flooding and Stormwater

Southlands Site - Stage 1

The Project occupies flood prone areas of the Site and therefore the flood study was required to demonstrate that the proposed Project did not have adverse flooding impacts on properties upstream or downstream of the Site. Previous studies identified that further development of large remaining undeveloped industrial sites (including the Southlands Site) without any drainage amelioration measures would result in increases in peak downstream discharges.

A number of options were considered during preliminary design assessment to determine the best approach for developing the Site from a flood mitigation perspective. Based on modelling of some 13 different scenarios, the flooding assessment concluded that the preferred option that provided no major adverse flood impacts on adjoining landholdings (either upstream or downstream) comprised the following measures for Stage 1:

- filling Stage 1 area to required site levels;
- removing material from the Stage 2 area to create a large detention basin to allow its interim use as compensatory flood storage area;

- providing a compensatory flood storage area on the Stage 2 area; and
- retaining the north-eastern area (Stage 3) in its existing state with the exception of filling the Paper Waste Pond.
- These measures have been incorporated into the development proposal for Stage 1.

Modelling work outlined in the flood investigations for the preferred option confirmed that the adoption of this approach for the Stage 1 works would not result in any significant adverse impacts on flood levels either upstream or downstream of the Site. Therefore no additional flooding is anticipated on any adjoining properties.

Detention basins are also included in the development design to ensure that there is no net increase in discharge from the Site during flood events. These would be in the form of in-ground detention basins (incorporating Gross Pollutant Traps) located under pavements and in the form of external dry basins adjoining Springvale Drain. Detailed design of these would consider the requirements of the Southlands RAP.

Further consideration of the compensatory flood storage area in terms of potential vapour issues from the interaction with groundwater is discussed in **Chapters 9** and **10**.

Southlands - Stage 2 and New Link Road

Filling of the Stage 2 and 3 areas of the Site (noting that this Application is not seeking approval for works to Stage 3 (other than filling the Paper Waste Ponds)) to at least the 1% AEP levels would be required to allow new industrial development. Filling of the Stage 2 area of the Southlands Site would remove the interim flood compensation area created during Stage 1 and therefore would require measures to address the flooding issues both on the Southlands Site and adjoining areas. The flooding assessment concluded that in order to accommodate the filling of the Stage 2 and Stage 3 area and alleviate existing flood issues in the area, the following works would be required downstream of the Site in association with the construction of the New Link Road:

- enlarging the culverts in Stage 1 under the new entry road crossing of Springvale Drain;
- constructing new culverts under McPherson Street and the new roundabout;
- constructing additional culverts running in tandem with the New Link Road between McPherson Street and the SWSOOS;
- constructing an additional siphon (or some other structure to increase flow capacity) under the SWSOOS;
- constructing new culverts in tandem with the New Link Road through Discovery Cove to the new intersection at Botany Road; and
- constructing a new road crossing for new culverts under Botany Road to connect with the existing open channel at the Caltex property that forms the effective entry to the Penrhyn Estuary (Botany Bay).

The flooding assessment concluded that the above Stage 2 works would serve to significantly improve flood conditions for the whole area downstream of the Site by significantly increasing the hydraulic capacity of Springvale Drain through to Botany Bay. Adding this new infrastructure would result in a significant positive impact on flood levels in the area allowing the subsequent filling of Stages 2 and 3 without any impact on any adjoining properties.

The proposed improvements to the hydraulic capacity of Springvale Drain would likely lead to a reduction in the duration of the flood hydrograph and an associated increase in the peak flow rate passing to Botany Bay. An increase in peak flow rate has the potential to affect the outlet to Botany Bay and the surrounding Penrhyn Estuary wetlands. Possible issues including scour near the outlet channel and wetland degradation could result without sufficient mitigation measures. Detailed design of the new infrastructure would therefore need to incorporate mitigating design features, prior to construction. These measures would be designed and modelled prior to any Stage 2 works being undertaken, and would ensure an optimal design solution resulting in no significant impact on the wetlands and Botany Bay.

Detailed design measures may include:

- Scour prevention through adjustment of the outlet configuration near Penrhyn Road to include rock rip-rap on the channel floor and rock protection on the banks immediately downstream of the outlet to reduce potential scour in the wetlands.
- Increased vegetation of the banks immediately downstream of the outlet.
- Upstream detention by the incorporation of additional in ground detention areas on the Southlands site, where possible.
- Upstream detention - potentially in the land adjacent to the section of drain between Foreshore Drive and Penrhyn Road. This could be achieved through excavation of a wider channel, a secondary channel or a detention basin in this area. Approval would need to be sought from the landowner.
- Pollutant removal through measures such as a detention basin or rock weirs in the channel upstream of Penrhyn Road to reduce sediment loading and a trash rack at the inlet to the culvert under Penrhyn Road.

Initial modelling and design resolution confirms that these measures are possible and would reduce flow and scour impacts in the Penrhyn Estuary, but detailed design and incorporation of these mitigating items would be required prior to the issuance of a Construction Certificate for the Stage 2 works. Building finished floor levels within Stage 2 would be set above the 1% AEP flood event with 300 millimetre (mm) freeboard and would also achieve the required remediation approach (refer to **Chapter 9** and **Appendix H** for further detail).

Downstream of the Southlands Site, the development of the New Link Road would require a bridge over the SWSOOS. Crossing of the Sydney Water SWSOOS would require further more detailed design and resolution of issues with Sydney Water. Development of Stage 3 would be the subject of future Project Application, however, Stage 3 will benefit from the major new infrastructure works undertaken in Stage 2 which will allow it to be filled to levels above the 1% AEP levels when required.

As discussed in **Section 6.5,** a Voluntary Planning Agreement (or similar arrangement) between the Proponent and CoBB is proposed in order to arrange for contribution to the cost of, and the co-development of the additional drainage infrastructure.

Detention basins are also included in the development design of Stage 2. These would be in the form of in-ground detention basins (incorporating Gross Pollutant Traps) located under pavements and in the form of external basins adjoining Springvale Drain. Detailed design of these would consider the requirements of the Southlands RAP.

8.4.2 Stormwater Quality

There is potential for stormwater quality impacts from the proposed industrial warehousing facility resulting from the generation of polluted runoff. The assessment concluded that the following measures would be required during the design and operation of the Southlands Project:

- source reduction measures such as on-site infiltration, porous pavements, etc to take advantage of the sandy soils in the catchment (subject to no adverse impacts on groundwater quality and requirements of the Southlands RAP);
- measures to intercept polluted runoff from industrial areas; and
- structures such as trash racks or gross pollutant traps to remove trash and coarse sediment, which might be implemented in conjunction with flood mitigation works such as detention basins (subject to no adverse impacts on flooding).
- The incorporation of these measures is shown on the conceptual stormwater plans presented in the *Civil Drawings.*

8.5 Summary of Mitigation Measures

A summary of the mitigation measures required is presented in **Table 8-1**.

Table 8-1 Summary of Flooding Mitigation Measures

Mitigation Measure	Implementation		
	Design	Construction and Remediation	Operation
A CEMP would be prepared and implemented detailing, as a minimum, the requirements during the remediation works in relation to the management of soil, stormwater and groundwater in accordance with the Southlands RAP.	✓ (Stage 1, 2 and New Link Road)	✓ (Stage 1, 2 and New Link Road)	
Detailed design of Compensatory Flood Storage Area Groundwater Reticulation System to prevent groundwater discharge into the area and prevent mixing of groundwater with contained flood waters. This would be reviewed by the Site Auditor as part of the Site Audit process leading to the issue of the Section A Site Audit Statement(s).	✓ (Prior to Stage 1)		
Detailed design of Stage 2 drainage infrastructure to incorporate measures to mitigate potential scouring and sediment impacts at Penrhyn Estuary.	✓ (Prior to Stage 2)		
Design of development would ensure no major adverse flood impacts on adjoining landholdings (either upstream or downstream).	✓ (Stage 1, 2 and New Link Road)		
Design of development would ensure no adverse impacts on stormwater quality through incorporation of appropriate stormwater quality control measures as shown on the *Civil Drawings*.	✓ (Stage 1, 2 and New Link Road)		
Negotiation of a Voluntary Planning Agreement (or similar arrangement) between the Proponent and CoBB for contribution of the cost of, and the co-development of the additional drainage infrastructure.	✓ (Stage 2)		
Undertake further more detailed design and resolution of issues with Sydney Water for the bridge crossing of the Sydney Water SWSOOS.	✓ (Stage 2, New Link Road)		

Soil, Geology and Contamination Chapter 9

9.1 Introduction

This chapter addresses the soils, geological and contamination aspects of the proposal on the Southlands Site for Stage 1 and 2 and the New Link Road.

URS has prepared a RAP for the Southlands Site (referred to herein as the Southlands RAP) which is summarised in this chapter. The full report is presented in **Appendix H**. The Southlands RAP also references a Human Health Risk Assessment (HHRA) prepared for the Southlands Site which is also presented in **Appendix H**.

The objective of the Southlands RAP is to render the Site suitable for future industrial / commercial land uses.

A Site Audit was commissioned to determine the nature and extent of contamination and the appropriateness of the proposed remedial action and whether the Site can be made suitable for the specified land use subject to the successful implementation of the Southlands RAP. As presented in the Site Audit Report and the Section B Site Audit Statement (refer to **Appendix I**), the Site Auditor has confirmed that the Site can be made suitable for the proposed development if the Site is remediated in accordance with the Southlands RAP. The Site Auditor has confirmed that implementation of the Southlands RAP is feasible and would enable the proposed development of the Site subject to the conditions outlined in the Site Audit Statement. The Site Audit process will continue throughout the implementation of the Southlands RAP with the eventual issue of Section A Site Audit Statement(s) certifying the suitability (or otherwise) of the Site for the proposed land use.

URS also undertook a Phase 1 and Limited Phase 2 Environmental Site Assessment for the areas proposed to be occupied by the New Link Road in the former MCS site and the Discovery Cove Estate. The full report is presented in **Appendix J**.

9.2 Existing Environment

9.2.1 Southlands Site - Stage 1 and 2

The following summary addresses the existing situation on the Southlands Site as a whole and therefore addresses the issues for Stage 1 and 2 of the proposed development.

Topography and Geology

The Southlands Site has an uneven surface with numerous mounds of filling materials. The levels gradually increase towards the eastern and southern corners of the Site. The lowest area is in the north western corner of the Site while the highest area is within the eastern side. The elevation difference between the two areas is about 2.8 m.

The geology of the Site is characterised by four main layers being: fill, loose sands, medium dense sand and dense / very dense sand. In addition, varying thicknesses of intermittent peaty, clayey and sandy peat layers are present in the area.

Summary of Soil Contamination

The HHRA and RAP were developed in tandem to establish and address respectively the remediation requirements for the Site. The HHRA process followed an iterative approach (refer to **Chapter 11** for further detail).

Chapter 9 Soil, Geology and Contamination

A review of Site environmental data available for Southlands was undertaken for preparation of the Preliminary HHRA. This review indicated the presence of contamination in groundwater, soil, sediment, surface water and air. The Preliminary HHRA identified the key issues for the Site which included the potential for shallow groundwater to discharge to Springvale Drain (resulting in emissions to air of volatile chlorinated compounds), potential for shallow groundwater to discharge into proposed compensatory flood storage areas (resulting in emissions to air of volatile chlorinated compounds) and the presence of residual impacts in soils on the Site. Issues identified in relation to emissions to air and vapour are discussed further in **Chapters 10** and **11**.

Contaminants identified in soil in various locations on the Site included:

- metals, in particular mercury and lead located in a few sampling locations on Block 1 (south western portion), mercury in soil at one sampling location on Block 2 and lead on one stockpile on Block 2;
- petroleum hydrocarbons in the south western portion of Block 1;
- volatile and semi-volatile chlorinated hydrocarbons (CHCs) identified in the south western portion of Block 1 and two sampling locations on Block 2;
- volatile and semi-volatile CHCs identified in some stockpiles located on Block 1 and one stockpile located on Block 2; and
- asbestos containing material (ACM) identified in surface fill and stockpiles on Block 2 and, to a lesser extent, Block 1.

A more detailed summary of the previous investigation data is provided in the Southlands RAP presented in **Appendix H**.

9.2.2 New Link Road

The following summary addresses the portion of the Discovery Cove Estate and former MCS site affected by the proposed New Link Road (to be developed as part of Stage 2).

Underlying Geology

Based on the limited Phase 2 soil investigation, the subsurface profile of the New Link Road area comprises predominantly granular fill materials to depths of 1 to 4 m, overlying very loose to loose, wet, sands and silty sands.

Much of the New Link Road area has been previously used for warehouse pavements, car parking, heavy vehicle pavements, and container storage.

Summary of Contamination

The assessment identified petroleum hydrocarbon soil contamination at the northern end of the investigation area. It was considered that the area would not be suitable for the proposed development of a road corridor without further assessment and potentially remediation.

Trigger values provided in ANZECC / ARMCANZ (2000) guidelines for chlorinated hydrocarbons were exceeded by concentrations in groundwater recorded in two locations. On the basis of the groundwater flow direction and the nature of the compounds detected in the groundwater, it is considered likely that the dissolved phase contamination detected in groundwater is related to the Orica Botany Groundwater

Contamination Plume which affects a larger area than the area addressed in the Phase 2 investigation, for which remediation and management measures are already in place. Therefore further assessment of impacts to the receiving environment was not considered necessary in the assessment.

The assessment found that the screening level assessment of potential risks to human health associated with vapours from dissolved phase chlorinated compounds in groundwater indicated further assessment was required. Such assessment may include direct measurement of vapour concentration at ground surface to provide input data for a quantitative assessment of risk. It is noted such programs are currently being undertaken by Orica in other local areas within the Orica Groundwater Contaminant Plume.

Further contamination investigations would be undertaken and a remedial approach developed for the New Link Road Site prior to development.

9.3 Assessment of Impacts - Construction

9.3.1 Southlands – Stage 1 and 2

Remediation (and / or management) of contamination is considered to be required to render the Southlands Site suitable for the proposed land use. The remediation objective is to remediate (and / or manage as appropriate) identified contamination so as to render the Southlands Site suitable for the proposed commercial / industrial development land use, in accordance with the relevant guidelines endorsed by the DECC under Section 105 of the CLM Act 1997.

The Southlands RAP has the following objectives for the proposed Stage 1 (Block 2) and Stage 2 (southern portion of Block 1) redevelopment areas of Southlands Site:

- to identify remediation requirements in the context of the DECC, NSW endorsed contaminated site assessment framework;
- to identify available remediation technologies and identify a suitable approach for remediation / management of identified contamination;
- to identify suitable remediation validation protocols (as required) for the Site;
- to assess and identify the regulatory and legislative frameworks for the remediation program; and
- to identify a framework for preparation of a long term Site management approach.

The RAP considered site specific development considerations and constraints arising from:

- the Environmental Assessment Requirements;
- the specific nature of the contaminants involved; and
- specific land management issues identified by the Proponent for future use and management of the land.

The Southlands RAP aims to render the Site suitable for future industrial / commercial land uses through:

- creation of a physical barrier to prevent site users accessing, and potentially being exposed to, ACM impacted and other contaminated fill and soils;
- implementation of vapour intrusion mitigation measures for Site structures as necessary; and

- implementation of a system to mitigate vapour concentrations from surface waters in Springvale Drain and other water bodies included in the proposal such as the compensatory flood storage area.

The site specific development considerations that formed the basis of the approach to remediation along with the findings of the HHRA include:

- *Site Flooding Solution and Development Staging* - The flood study (**Appendix G** and **Chapter 8**) determined that the modelled 1 in 100 year flood design level is higher than the existing mean site elevation. The staging of the development with respect to flood storage capacity of each area was also an issue for the remediation approach.
- *Springvale Drain* - Ambient air monitoring has detected elevated concentrations of volatile organic compounds (VOCs) in ambient air in the vicinity of Springvale Drain.
- *Compensatory Flood Storage Area* - Ponding of contaminated groundwater within this area (or any area on Southlands) may pose unacceptable risks to workers health on the Site.
- *Existing BGC Infrastructure* – the development of the Site has requirements associated with Orica's continued groundwater extraction and containment, as well as adequate pro*vision for ongoing monitori*ng of the hydraulic regime and groundwater quality across Southlands.
- *Groundwater Monitoring Infrastructure* - The remedial approach for the Site requires design of a replacement groundwater monitoring well network and provision of a framework for ensuring that continued access to these wells is achieved. It must also provide for decommissioning of the existing wells which will no longer be required. It is noted that although the RAP addresses these issues, this Application does not seek approval for these works as they relate specifically to the NCUA and will be implemented in accordance with approvals sought separately by Orica.
- *Nant Street Tank Farm Pipeline* - Future access to the buried pipeline adjacent to Nant Street is required.
- *Easements for Groundwater Monitoring and Future Remediation* - Orica has identified a requirement for continued access to a series of easements on the Southlands Site for use for both groundwater monitoring and extraction as well as for future remediation technologies, should such become available or relevant to groundwater remediation of the Site.
- *Asbestos Containing Materials (ACM)* - Relatively limited site soil investigations undertaken to date have shown that the surface fill and stockpiles on Stage 1 (Block 2) and, to a lesser extent, Stage 2 (Block 1) are impacted with ACM.

As presented in the Site Audit Statement (refer to **Appendix I**), the Site Auditor has confirmed that the Site can be made suitable for the proposed development if the Site is remediated / managed in accordance with the Southlands RAP. The Site Auditor has confirmed that implementation of the Southlands RAP is feasible and would enable the proposed development of the Site subject to the conditions outlined in the Site Audit Statement.

Remediation Approach (Stage 1)

The Southlands RAP considered a remedial approach based on on-site containment, through implementation of a physical barrier layer, as the basis for Stage 1 remediation on Block 2. This approach is based upon consideration of the existing environmental data available for the Site, the outcome of the Preliminary and Final HHRAs as well as the development constraints, in particular those associated with:

- the requirement for filling on Stage 1 (Block 2) to meet the site flood design levels; and
- the constraints imposed by the presence of ACM.

In this respect, the remediation approach for Southlands would essentially be achieved in tandem with the flooding solution for the Site.

Chapters 10 and **11** present further refinement of the remediation approaches presented in the RAP to address the requirement for the mitigation of the issues of risks to human health associated with ambient air quality in the vicinity of both Springvale Drain and the proposed compensatory flood storage area on the southern portion of Block 1 (Stage 2). These risk issues currently preclude the proposed development land use.

The remediation works would generally involve:

- vegetation reduction, preliminary screening and segregation of stockpiles and minor hot spots, removal of any redundant concrete hard stands and / or pads remaining after any required rerouting of BGC Project pipe work;
- management of ACM in accordance with the CEMP and SSHSEP;
- removal of excavated HCB impacted materials and (as appropriate) storage on BIP for future treatment using the DTD plant proposed for establishment by Orica on BIP;
- filling of the Stage 1 area of the Site with Virgin Excavated Natural Materials (VENM) and/or Excavated Natural Material (ENM) (other than materials cut from the southern portion of Block 1), with materials appropriately placed and compacted to create a physical barrier layer for ACM in accordance with the RAP;
- excavation works in the (future Stage 2 Area) to create a compensatory flood storage area for Stage 1 and to remove stockpiles and ACM;
- provision of a system to prevent mixing of flood waters contained within the compensatory flood storage area with the underlying groundwater as well as prevent discharge of contaminated waters to Springvale Drain; and
- backfilling of the Paper Waste Ponds.

The remediation approach for the Site provides both a physical barrier to ACM impacted materials as well as a vapour intrusion mitigation measures to prevent the accumulation in buildings and structures of vapours derived from contaminated groundwater. To achieve a barrier to ACM impacted materials, it is proposed to construct a physical barrier across the entire Site to prevent contact between Site users and underlying ACM impacted contaminated materials. Given the thickness of filling (greater than 1 m) required to meet the flood design levels (refer to **Chapter 8** and **Appendix G**), it is considered that the engineered fill required to meet these flood levels and associated concrete paving would achieve this objective.

Chapter 9 Soil, Geology and Contamination

In other areas of the Site where there is a risk of vapour accumulation beneath structures vapour intrusion mitigation measures are proposed. The design of the proposed vapour mitigation measures for future site buildings / structures is ongoing and includes the completion of a vapour intrusion conceptual model and preliminary remedial options study. The review and approval by the Site Auditor of the study and the proposed mitigation measures is a condition of the Site Audit Statement (refer to **Appendix I**).

Further detail on the remediation scope for Stage 1 is presented in the Southlands RAP.

Validation of the physical barrier system and verification of other remediation works (such as vapour intrusion mitigation measures) are required to ensure that remediation works have been conducted in accordance with requirements of the Southlands RAP. An outline of the validation program is provided in the Southlands RAP. Verification of the vapour risk mitigation measures would be approved by the Site Auditor as part of the issuance of the Section A Site Audit Statement(s).

Remediation Approach (Stage 2)

Stage 2 of the development is located in the southern portion of Block 1. This portion of the Site would be used as a compensatory flood storage area during Stage 1.

Remediation components pertinent to development of Stage 2, which would be completed as part of Stage 1 works would include:

- backfilling of the Paper Waste Ponds; and
- removal of impacted soils.

Given these components would be achieved during Stage 1, based on the conclusions of the HHRA (refer to **Appendix H**) the main issues remaining would be:

- management of potential ACM in fill (and remaining stockpile material, if any); and
- management of the potential for accumulation in buildings (or other structures) of vapours associated with the contaminated shallow groundwater beneath Block 1.

Further detail on the remediation scope for Stage 2 is presented in the Southlands RAP.

The proposed flood solution (as discussed in **Chapter 8**) requires importation and placement of up to 1 m of validated fill to raise the site elevation to meet the 1 in 100 year flood design level. It is proposed that the physical barrier would be designed to prevent exposure to potential ACM impacted soils.

Further Information Requirements

The RAP identifies several requirements that include preparation of specific plans or other documents as part of its implementation. The RAP intends the list would be updated and augmented as the Site development proceeds. These components would be reviewed as part of the Site Audit process leading to issue of Section A Site Audit Statement(s) by the Site Auditor.

9.3.2 New Link Road

The New Link Road Site may need to be excavated and prepared with consideration given to potential geotechnical constraints and treatment of the site. A 'bridge' crossing of the central SWSOOS pipeline is likely to be required. Additional geotechnical investigation in the region of the SWSOOS pipeline and crossing would be required in consultation with Sydney Water.

Further contamination investigations would be undertaken for the New Link Road Site and a remedial approach would be developed to address the issues identified in the Phase 1 and Limited Phase 2 investigation.

9.4 Assessment of Impacts – Operation

9.4.1 Southlands Site – Stage 1 and 2

A Long Term Environmental Management Plan (EMP) would be prepared to ensure activities which could potentially result in exposure of future land users to the contained ACM impacted soils, contaminated groundwater beneath the Site, and/or groundwater vapours are precluded or limited/controlled. The specific requirements of the long term EMP for these issues are outlined in the RAP (**Appendix H**). The Long Term EMP would be referenced in the overall Operational EMP (OEMP). The Long Term EMP is required as part of the remediation process to address specific requirements of DECC endorsed guidelines listed under Section 105 of the CLM Act 1997.

In addition, CoBB requires that where contaminated materials are retained on-site under a physical barrier and further maintenance is required, a covenant is required to be placed on the title to the land. This may also be a condition of the Section A Site Audit Statement(s).

The proposed remediation and development of the Southlands Site has been planned to be staged in a manner that will allow Orica to meets its ongoing groundwater clean-up obligations. Orica's obligations with respect to the Southlands Site include:

- performing further investigations and trialling removal technologies for groundwater contaminant source areas located beneath Stage 3 prior to development in that area; and
- maintaining the GTP throughout and following implementation of the Southlands Remediation and Development Project in accordance with the terms of the NCUA or other regulatory requirements.

9.4.2 Stage 2 – New Link Road

The remedial approach developed for the New Link Road would address any requirements for long term environmental management during operation of the New Link Road.

9.5 Summary of Mitigation Measures

A summary of recommended mitigation measures is presented in **Table 9-1**.

Chapter 9 Soil, Geology and Contamination

Table 9-1 Summary of Soil, Geology and Contamination Mitigation Measures

Mitigation Measure	Implementation		
	Design	Construction and soil remediation	Operation
The requirements of the Southlands RAP would be implemented as detailed in **Appendix H** and the conditions listed in the Section B Site Audit Statement (**Appendix I**).	✓ (Stage 1 and 2)	✓ (Stage 1 and 2)	✓ (Stage 1 and 2)
The review of further studies and plans required under the Southlands RAP would be undertaken as part of the Site Audit process leading to issue of the Section A Site Audit Statement(s) by the Site Auditor.	✓ (Stage 1 and 2)	✓ (Stage 1 and 2)	✓ (Stage 1 and 2)
Issue of Section A Site Audit Statement(s) to establish Site suitability for the proposed land use.		✓ (prior to construction of Stage 1 and 2)	
The CEMP would address soil and erosion control as identified in the Southlands RAP. Stage 2/3 area would have erosion and sediment controls implemented prior to Stage 2/3 being developed.	✓ (Stage 1 and 2)	✓ (Stage 1 and 2)	
The CEMP would address soil and erosion control as identified in the remedial approach for the New Link Road.	✓ (New Link Road)	✓ (New Link Road)	
A Communications Plan would be prepared are part of the CEMP and implemented to ensure effective and efficient consultation with stakeholders for the duration of the soil remediation and Site development works and include requirements as provided in the Southlands RAP.	✓ (Stage 1 and 2)	✓ (Stage 1 and 2)	
A detailed physical barrier design would be prepared prior to implementation of the remedial approach. Design of the proposed vapour mitigation measures for future Site buildings/structures would be completed prior to implementation of the remedial approach. These designs would be reviewed by the Site Auditor as part of the Site Audit process leading to the issue of the Section A Site Audit Statement(s).	✓ (Stage 1 and 2)	✓ (Stage 1 and 2)	
All underground services beneath and in the environs of Southlands, would be mapped and documented in detail. This is required to avoid intercepting services during remediation works that require excavation, as well as to enable incorporation of service and easement locations into the long term EMP.	✓ (Stage 1 and 2)	✓ (Stage 1 and 2)	✓ (Stage 1 and 2)
A Site Specific Health, Safety and Environment Plan (SSHSEP) would be prepared and implemented for the Site in accordance with the framework described in the Southlands RAP.	✓ (Stage 1 and 2)	✓ (Stage 1 and 2)	
A Long Term EMP (referenced in the EMP) would be prepared and implemented to ensure activities which could potentially or directly result in exposure of future land users to ACM impacted and other contaminated soils beneath the physical barrier, and / or vapours from Springvale Dain are precluded or limited / controlled and to include the requirements outlined in the Southlands RAP. This would be reviewed by the Site Auditor as part of the Site Audit process leading to the issue of the Section A Site Audit Statement(s).			✓ (Stage 1 and 2)

Mitigation Measure	Implementation		
	Design	Construction and soil remediation	Operation
A remedial approach would be developed for the New Link Road Site to address the issues identified in the Phase 1 and Limited Phase 2 investigation.	✓ (Stage 2, New Link Road)		

10.1 Introduction

This chapter presents an overview of the assessment of local and regional air quality issues related to the Project. The air quality assessment was undertaken by Holmes Air Sciences. The assessment focuses on the air quality issues associated with the operation of the Site and also addresses the potential for dust impacts during construction. The complete Regional Air Quality Assessment Report is presented in **Appendix K**.

Air quality issues associated with volatile chemicals, odour and dust generated by ACM have also been addressed in the Southlands RAP and HHRA presented in **Appendix H** and are summarised in this Chapter. As presented in the Section B Site Audit Statement (refer to **Appendix I**), the Site Auditor has confirmed that the Site can be made suitable for the proposed development if the Site is remediated in accordance with the Southlands RAP. The Site Auditor has confirmed that implementation of the Southlands RAP is feasible and would enable the proposed development of the Site subject to the conditions outlined in the Site Audit Statement. The audit process would continue throughout the implementation of the Southlands RAP with the issue of Section A Site Audit Statement(s) including a statement of suitability of the Site for the proposed land use.

10.2 Existing Environment

10.2.1 Local Air Quality

Local air quality is influenced by a range of activities including transport as well as industrial sources with sulfur dioxide and volatile organic hydrocarbon emissions.

10.2.2 Site Air Quality

The Preliminary HHRA has identified potential human health risk issues in relation to inhalation of volatile chemicals associated with emissions to air from Springvale Drain that are required to be addressed in order to make the Site suitable for industrial development.

In addition, modelling untaken in the Preliminary HHRA has indicated that a scenario where shallow groundwater discharges into the compensatory flood storage (implemented in the Stage 2 area as part of the Stage 1 works) would be unacceptable from a human health risk perspective in relation to inhalation of volatile chemicals without further management.

10.3 Potential Air Quality Issues - Construction and Remediation Activities

10.3.1 Southlands – Stage 1 and 2

Dust generation

- There is potential for dust generally to be generated during remediation and construction. It is also noted that given the potential for ACM across the Site dust management is of vital importance for the Project.

Chapter 10 Air Quality

Dust generation and transport off-site would be controlled by measures prescribed in the Air Quality Management Plan prepared and implemented as part of the CEMP in accordance with the requirements outlined in the Southlands RAP. The Air Quality Management Plan would be consistent with WorkCover NSW, DECC, and CoBB requirements. The effectiveness of dust control measures would be monitored as described in the Southlands RAP by:

- qualitative assessment (i.e. visual inspection); and
- air quality monitoring.

Inhalation of volatile chemicals – Springvale Drain

Vapour concentrations associated with emissions to air from Springvale Drain would be managed by Orica through implementation of an active mitigation system aimed at reducing the discharge of contaminated shallow groundwater into Springvale Drain (by way of a shallow groundwater extraction system). The shallow water table would be maintained beneath the invert of Springvale Drain, preventing groundwater discharge. This system would reduce the potential for volatile emissions from surface waters to ambient air in the vicinity of the drain.

It is noted that this Application does not seek approval for these works as they would be conducted separately by Orica under their NCUA prior to building construction occurring on the Site. However verification of these works would be required as part of the Site Audit process leading to the issue of the Section A Site Audit Statement(s) for the Southlands Site by the Site Auditor.

Inhalation of volatile chemicals – Compensatory Flood Storage Area

A passive subsurface groundwater drainage / reticulation system would be incorporated in to the detailed design to minimise contaminated groundwater discharge into the compensatory flood storage area and to prevent mixing of groundwater with flood waters. Further detail on the system would be provided in the detailed design. Locations of the proposed subsurface infrastructure for this system would be determined in the detailed Site design. Management of soils and / or spoils generated during installation of such a system would form part of the remediation contract specification documents.

Odour Management

The overall objective of odour management is to control the odours generated from the proposed works, ensure minimal impact on the air quality of the local area, and to ensure that the works present no unacceptable risks to the health of on-site workers and the general community.

Odour / vapour management measures and monitoring would be implemented into the CEMP for the Site as described in the Southlands RAP (**Appendix H**).

10.3.2 New Link Road

Air quality issues associated with construction of the New Link Road, such as dust generation would be dealt with in the CEMP.

10.4 Potential Air Quality Issues – Operation

10.4.1 Southlands – Stage 1 and 2

The proposed warehouse / commercial development brings with it motor vehicle usage and energy consumption and attendant increases in air emissions. The proposed activities at the Site include warehousing and limited ancillary commercial businesses. No processing or manufacturing of goods is proposed to take place on the Site.

The proposed hours of operation are 24 hours a day, 7 days a week. The likely activities which have the potential to result in air emissions during operation are:

- Staff and delivery vehicles into and out of the Site.
- Use of LPG powered fork lifts and other mobile plant.
- Windblown dust from paved surfaces.

In addition, there is potential for emission of volatile chemicals and odours.

These issues are discussed in more detail below.

Traffic

Traffic for the Site would be generated by the warehouse and commercial businesses when operational. This volume is considered to be relatively small and exhaust emissions would make a very minor contribution to local air quality. The effect on regional air quality would also be small. There may be some benefit to regional air quality if truck movements to warehousing in the local area replace movements to western Sydney, thereby reducing vehicle kilometres travelled. Whilst this is considered a small benefit, it is consistent with NSW Action for Air Policy.

On-site Operational Activities

Emissions generated on-site would relate to warehousing activities such as forklift and other mobile plant operation. The use of LPG forklifts rather than diesel-powered vehicles would reduce emissions of fine particles. Trucks moving on paved surface would have the potential to cause dust emissions, however these would be reduced by keeping the paved areas clean. The off-site impacts would also be reduced by landscaping which would help to filter the dust emissions. Other general Site activities are not likely to be a source of air emissions. However, as the Site becomes occupied, potential sources would need to be identified and assessed on a case-by-case basis.

Following development of Stage 1, the Stage 2 / 3 area would have erosion and sediment controls in place prior to Stage 2 / 3 being developed. This would reduce the potential for dust emissions (and potential dust from ACM) from this portion of the site during operation of Stage 1.

Inhalation of vapours

The HHRA identified the risk issues for Stage 1 and Stage 2 and proposed risk mitigation measures (refer to **Chapter 11** and **Appendix H** for more detail). Additional verification data from the vapour risk mitigation measures would be prepared in accordance with the Southlands RAP. Verification of these measures is required as part of the Site Audit process prior to the issue of the Section A Site Audit Statement(s) for the Southlands Site by the Site Auditor.

Chapter 10 Air Quality

Odour

Issues have been previously identified in relation to the potential for odour from Springvale Drain during operation of the Site. As noted above, the Southlands RAP (**Appendix H**) and **Chapter 9** identify a vapour mitigation system addressing the human health risk from inhalation of the vapours from Springvale Drain. It is considered that this system in mitigating the human health risk, would also address any potential for odour issues from Springvale Drain during operation.

10.5 Summary of Mitigation Measures

A summary of the mitigation measures required is presented in **Table 10-1**.

Table 10-1 Summary of Air Quality Mitigation Measures

Mitigation Measure	Implementation		
	Design	Construction and Remediation	Operation
Develop and implement an Air Quality Management Plan as part of the CEMP to manage and mitigate dust and other air quality issues and address the requirements for measures and monitoring outlined in the Southlands RAP.		✓ (Stage 1 and 2)	
The requirements of the Southlands RAP would be implemented as detailed in Appendix H and the conditions listed in the Section B Site Audit Statement (**Appendix I**).	✓ (Stage 1 and 2)	✓ (Stage 1 and 2)	✓ (Stage 1 and 2)
The review and approval of further studies and plans required under the Southlands RAP would be undertaken as part of the Site Audit process leading to issue of the Section A Site Audit Statement(s) by the Site Auditor.	✓ (Stage 1 and 2)	✓ (Stage 1 and 2)	✓ (Stage 1 and 2)
A Vapour Intrusion Conceptual Model and detailed design of the Vapour Intrusion Mitigation Measures for Site Structures would be prepared for review and approval by the Site Auditor as part of the Site Audit process leading to issue of the Section A Site Audit Statement(s) by the Site Auditor.	✓ (prior to Stage 1)	✓ (prior to Stage 1)	✓ (prior to Stage 1)
Detailed design of Compensatory Flood Storage Area Groundwater Reticulation System would prevent groundwater discharge into the area and prevent mixing of groundwater with contained flood waters. The detailed design would be reviewed by the Site Auditor as part of the site audit process leading to issue of the Section A Site Audit Statement(s) by the Site Auditor.	✓ (prior to Stage 1)	✓ (prior to Stage 1)	✓ (prior to Stage 1)
The long term EMP will include additional contingency measures to be finalised following further air sampling after the proposed infilling of the re-alignment channel.	✓ (prior to Stage 1)	✓ (prior to Stage 1)	✓ (prior to Stage 1)

11.1 Introduction

A quantitative HHRA has been prepared by URS for the Southlands Site. The HHRA forms a reference document for development of the Southlands RAP and this Environmental Assessment. The methodology and findings of the HHRA are presented as an appendix to the Southlands RAP contained in **Appendix H**.

This chapter summarises the outcomes of the risk assessment. Further information on the Southlands RAP is provided in **Chapter 9**.

11.2 Objectives of the Human Health Risk Assessment

Based on the available information on the proposed development of Southlands, the overall objectives of the HHRA are:

- to provide a quantitative assessment of potential risks to human health associated with the presence of chemicals in soil, groundwater, surface water and air relevant to the proposed Stage 1 development; and
- to provide a quantitative assessment of potential risks to human health associated with the presence of chemicals in soil, groundwater, surface water and air relevant to the proposed Stage 2 development; and
- depending on the outcome of the HHRA, identify issues that require risk mitigation measures to be incorporated into the Southlands RAP with the development risk based soil, groundwater and/or vapour concentrations that can be used at a screening level for further investigation or remediation end-points (if required).

11.3 Risk Assessment Approach

The process followed for the completion of the HHRA was an iterative approach. The available Site data and the general development proposal was considered initially in a Preliminary HHRA. The outcome of these investigations, discussions and identified risk management measures were then incorporated into the RAP. The risk management measures proposed were then further considered in the completion of the HHRA.

The Preliminary HHRA (provided in **Appendix H**) was undertaken to provide an initial assessment of risks to human health (based on no specific development details and no remediation being undertaken) which identified key issues that required consideration prior to completion of the HHRA and RAP.

The HHRA follows on from the Preliminary HHRA and provides a detailed assessment of risks to human health based on the proposed development. The HHRA provided input into the RAP to enable key issues relevant to the remediation of the Site to be adequately identified and addressed as required.

The HHRA presents human health issues associated with Orica's contamination at the Southlands Site. The Consolidated HHRA (URS, 2005) and subsequent monitoring reports prepared for Orica address human health issues at Discovery Cove and surrounding sites.

Chapter 11 Human Health Risk Assessment

11.3.1 Preliminary Risk Assessment

As noted in **Chapter 9**, the Preliminary HHRA identified a number of key issues that required further assessment and risk management measures prior to completion of the HHRA. The key issues identified included the potential for shallow groundwater to discharge to Springvale Drain (resulting in emissions to air of volatile chlorinated compounds), potential for shallow groundwater to discharge into proposed compensatory flood storage areas (resulting in emissions to air of volatile chlorinated compounds) and the presence of residual impacts in soils on the Site.

Further investigations were undertaken and risk management measures were identified to address these issues. The outcome of these investigations and the identified risk management measures were discussed in the Southlands RAP and the requirements arising were incorporated into the remediation scope.

11.3.2 Southlands HHRA

The risk management measures proposed in the preliminary HHRA were then further considered in the final HHRA. The HHRA was undertaken as a site-specific assessment that considered key aspects of the proposed development, flood management requirements and risk management measures. These included the filling in of existing ponds on Block 1, construction of compensatory flood storage areas on the southern portion of Block 1, the placement of fill on Blocks 1 and 2 prior to construction of buildings to address flood issues and the restriction of access to the northern portion of Block 1 (proposed future Stage 3 development).

The quantification of risks to human health on the Southlands Site has focused on chronic (long-term) exposures by workers (commercial workers, gardeners and maintenance workers) and shorter-duration (not acute) exposures by workers involved in intrusive works (associated with the maintenance of subsurface services) on the Site following completion of the proposed development.

With respect to risk management measures the assessment considered proposed measures designed to intersect shallow groundwater prior to discharge into Springvale Drain (with groundwater directed back to the GTP) and the drainage system proposed to control shallow groundwater in the area of the compensatory flood storage area on Block 1.

The performance of these measures would need to be monitored through the collection of appropriate data for some time after commissioning. A framework for verification is provided in the Southlands RAP.

Table 11-1 presents a summary of the risk issues and the site specific risk mitigation measures that were modelled in the HHRA associated with the development of Stage 1 and Stage 2.

Table 11-1 Summary of Risk Issues and Mitigation Measures identified in HHRA

Issue	Identified Risk	Risk Mitigation Measures
All Aspects of the Proposed Development		
Workers involved in intrusive works in areas including the maintenance of BGC infrastructure	Potential for elevated exposures to chemicals in shallow groundwater and inhalation of volatile chlorinated chemicals (particularly within confined spaces).	All works to be undertaken under a Long Term Environmental Management Plan that ensures development of job specific safe work practices including addressing any issues associated with works that breach the areas covered with barriers.
Workers involved in maintenance of Springvale Drain	Potential for elevated exposures to chemicals in surface water and inhalation of volatile emissions.	All works to be undertaken under a Long Term Environmental Management Plan that ensures development of job specific safe work practices.
Presence of asbestos fibres in soil	Potential for generation of dusts containing asbestos fibres.	Placement of appropriate barrier. Where no physical barrier is present a sound ground cover should be maintained to minimise generation of dusts. These areas need to be considered in a Long Term Environmental Management Plan.
Inhalation of volatile chlorinated chemicals associated with emissions to air from Springvale Drain*	Potential for significant exposures by all users of the site on basis of measurements completed to date.	Surface water concentrations within the drain would need to be lowered. This may require a reduction in the discharge of shallow groundwater into Springvale Drain. Proposed mitigation measure involves a shallow groundwater extraction system adjacent to Springvale Drain to intercept groundwater prior to discharge into the drain, with groundwater directed to the GTP. Exposures are expected to be lower once system is installed, however the effectiveness requires verification. Risk issues when the GTP is offline need to be reviewed in the final design and management of such a system. It is noted that these mitigation measures are being addressed through a separate approvals process under the NCUA.
Stage 1 Development (also relevant to Stage 2 development)		
Elevated concentrations of contaminants of concern in the soil and sediment in the ephemeral Paper Waste Ponds – that are moved across the site during earthworks	Potential for elevated exposure by workers in area not covered with barriers, including gardening activities (ingestion, dermal contact and vapour intrusion into buildings)	Remediation of assumed hot-spots to a level protective of all exposures including vapour intrusion (refer to details in HHRA). Remediation to derived risk-based concentrations (derived and presented in the HHRA to assist in this process for some key chemicals) or other guidelines that can be justified on the basis of risks to human health. Further sampling could be undertaken to better define the extent of the area affected by elevated concentrations.
Inhalation of volatile chemicals in outdoor air (emissions from soil and groundwater)	No issues identified for outdoor air if the compensatory flood storage area is appropriately designed to prevent groundwater discharge to the surface.	Effectiveness of the proposed drainage system for the compensatory flood storage areas on Block 1 requires verification.

Chapter 11 Human Health Risk Assessment

Issue	Identified Risk	Risk Mitigation Measures
Inhalation of volatile chemicals in outdoor air and within buildings constructed on Block 2 (emissions from some subsurface soil and groundwater)	No issues identified (this is subject to the findings of sub slab investigations in the local area currently being undertaken by Orica).	Review of vapour intrusion issues that may arise as a result of the consideration of issues associated with the presence of a large slab.
Stage 2 Development		
Inhalation of volatile chemicals within buildings constructed on the southern portion of Block 1 (emissions from some subsurface soil and groundwater)	Potential for elevated exposure to volatile chlorinated chemicals, present in shallow groundwater, that may migrate into buildings (including buildings associated with BGC infrastructure).	If buildings are constructed in the area vapour mitigation measures should be incorporated into the building design. Such measures may include passive barriers, sub-slab depressurisation or building pressurisation.

Note * Further to the HHRA, an additional program of surface water and ambient air monitoring has been conducted to further characterise surface water and ambient air concentrations in the vicinity of SVD (URS 2008c, December). The reader is referred to this document and oricabotanytransformation.com for the most recent analytical data and discussions regarding the ambient air quality in the vicinity of Springvale Drain.

11.3.3 Additional Considerations

The Southlands RAP describes installation of a vapour mitigation system for Springvale Drain (by way of shallow groundwater extraction system) to be undertaken as part of Orica's obligations under the NCUA.

The system would contain and extract shallow groundwater and transfer to the GTP for treatment. However creating such a drawdown may allow migration beneath the drain of shallow contaminated groundwater that was previously intercepted by the drain. If this were the case, then the issues of potential vapour intrusion into buildings that were identified for Stage 2 may become pertinent for Stage 1.

Management of these potential effects would include:

- detailed modelling to establish if the design draw-down levels could cause vapour issues on Stage 1 and the timeframe over which it is expected to occur; and
- incorporation of vapour mitigation measures, as proposed for Stage 2 development into building design for Stage 1 if required.

In addition, Orica proposes to infill the Springvale Drain re-alignment channel and is seeking approval for these systems through separate approvals processes under the NCUA.

The long term EMP would be required to outline strategies to manage the risk scenario of the event that both the GTP and its primary contingency, the Temporary Aquifer Storage Recovery system, are both off line and rainfall levels at that time are sufficient to result in discharge of groundwater into Springvale Drain. The proposed additional contingency measures in the long term EMP would be finalised following further air sampling after the infilling of the re-alignment channel.

11.4 Soil Quality

The HHRA calculated site specific risk based soil criteria for some of the volatile contaminants of concern in soils on the Site. The risk based soil criteria have been used in the identification of impacted soil, located mainly in the Stage 2 area that requires remediation. The risk based soil criteria are included in the validation criteria presented in the Southlands RAP.

11.5 Summary of HHRA

On the basis of the available data, risks to human health associated with the proposed development were quantified. Following this process, the HHRA identified a number of risk issues that warranted further consideration within the Southlands RAP (and presented in **Table 11-1**) particularly in relation the following issues:

- Emissions to air from Springvale Drain associated with the discharge of shallow groundwater into the open drain particularly during periods of rainfall. A risk management system has been proposed to intersect shallow groundwater prior to discharge into the drain. The proposed system involves a shallow groundwater extraction system adjacent to Springvale Drain to intercept groundwater prior to discharge into the drain, with groundwater directed to the GTP (refer to the Southlands RAP for details). Exposures are expected to be lower once system is installed; however the effectiveness requires verification through the collection of appropriate data for some time after commissioning. In addition, risk issues when the GTP is offline need to be reviewed in the final design and management of such a system. It is noted that these issues are being addressed through a separate approvals process under the NCUA.
- The HHRA considered the unlikely event scenarios where the GTP and secondary systems (such as the proposed Temporary Aquifer Storage Recovery) fail for sufficient periods of time to allow groundwater to enter the Springvale Drain. Additionally, in order to be conservative, it has been assumed that groundwater may also accumulate in the flood compensation area. Allowable exposure frequencies were estimated for emissions from the Springvale Drain under such circumstances. As a result of the above, a set back distance of 20 m from the Springvale Drain has been factored into the development plan (presented in **Figure 5-2** and **5-4**) in order to be conservative. The 20 m buffer zone either side of the drain would be fenced and access by workers would be precluded.
- Emissions to air from the compensatory flood storage area proposed for Block 1 associated with discharge of shallow groundwater into the area and the design and management of the proposed drainage system to prevent shallow groundwater discharge at the surface (refer to Southlands RAP for details). This system would be designed as part of the detailed design for the Project and is part of this Project Application. The effectiveness of the drainage system requires verification through the collection of appropriate data for some time after commissioning. This design would be validated and the validation report would be reviewed and approved by the Site Auditor as part of Site Audit process and prior to issuance of the Section A Site Audit Statement(s).
- Management of residual asbestos fibres in soils through the placement and management of clean fill.
- Management of residual soil contamination (using preliminary risk based criteria derived in the HHRA to assist in the removal of residual contamination);
- Mitigation of vapour intrusion into commercial buildings (on Block 1 in particular, and possibly Block 2); and
- Requirement for a long term environmental management plan that addresses intrusive works across the site and access to open drains and the northern portion of Block 1.

The Southlands RAP has further identified the suite of validation, verification and site management measures and reporting required to address these issues. A framework for these reports is provided in the Southlands RAP (**Appendix H**). With the exception of the SSHSEP, Site Auditor review of these

reports would be undertaken as part of the Site Audit process leading to the issue of the Section A Site Audit Statement(s) for the Southlands Site. The Section A Site Audit Statement would establish site suitability for the proposed land use.

The preparation of these reports and the specific mitigation measures are identified in the tables of mitigation measures in **Chapters 9** and **10** and have not been duplicated here.

11.6 Conclusion

Overall, the assessment of potential risks to human health on the Southlands Site is complex. Soil, sediment, water and air data collected from the Southlands Site have been used in the assessment presented. However as the HHRA is based on a proposed development, where there is uncertainty or data gaps with respect to areas \ information that define potential exposures on the Site, a conservative approach has been adopted.

On the basis of the HHRA undertaken, providing the risk management measures identified and detailed in the Southlands RAP are implemented and verified (where required), long-term risks to workers and visitors to the proposed Stage 1 and 2 development of Southlands are considered to be acceptable.

The approach has been verified by the NSW DECC Site Auditor (refer to **Appendix I**).

12.1 Introduction

This chapter summarises the traffic impact assessment for the proposed Project. The assessment was conducted in two parts. The first part addressed all three stages of the Project and the second part addressed the implications for Stage 1 and 2. The assessment was prepared by Traffix and is presented in full in **Appendix L**.

12.2 Existing Environment

The Southlands Site is presently accessed via McPherson Street, which is in turn only accessible via Hills Street and Exell Street (refer to **Figure 5-3**). These streets form a one-way pair connecting McPherson Street with Botany Road in the south. Specifically, Hills Street provides a one-way northbound connection from Botany Road (into the precinct), while Exell Street provides a one-way southbound connection to Botany Road (out of the precinct).

These two intersections therefore provide a capacity constraint to the development of the industrial precinct north of Botany Road.

Other intersections in the locality also present potential constraints to development of the precinct. These lie generally to the east of Exell Street and include the western intersection of the Discovery Cove Estate with Botany Road and further to the east there are some concerns over the performance of the intersection of Botany Road with Foreshore Drive.

As discussed in **Chapter 7**, feedback received in public workshops during development of the Environment Assessment indicates that local businesses and residents have a high degree of dissatisfaction with the existing traffic situation in the proximity of the Site and are concerned about how traffic impacts would be managed for the proposed development.

12.3 Assessment of Impacts – Earthworks, Soil Remediation and Construction Traffic

12.3.1 Assessment of Impacts - Stage 1

Construction of the Stage 1 development is expected to be undertaken over an 18 month period, with peak truck visitation occurring during the initial 9 month period when the Site is being filled. The construction traffic assessment for Stage 1 of the proposed development indicated an average of 50 to 60 trucks per day (i.e 60 movements in and 60 out), with peak activity periods (such as the importation of fill material) generating up to 100 trucks per day. Under normal conditions, the average truck level would be spread over a 10 hour day, with an average of 6 trucks per hour (i.e. 6 in and 6 out). This equates to one truck arrival every 10 minutes along Hills Street; or one truck departure every 10 minutes in Exell Street. This was considered to be a moderate increase in traffic movements and able to be readily accommodated in the context of existing traffic conditions with no requirement for any upgrading.

12.3.2 Assessment of Impacts - Stage 2

The construction traffic assessment for Stage 2 needs to consider the filling and site works associated with the Stage 2 area of the Site as well as the construction of the New Link Road.

Chapter 12 Traffic and Transport

Construction of the New Link Road would require access from both the Discovery Cove and the McPherson Street ends of the New Link Road. Therefore this would involve construction vehicles accessing and carrying out works within the Discovery Cove Estate; accessing the former MCS site via Botany Road; and accessing the Site via Hills Street and onto McPherson Street while Stage 1 is operational.

It is expected that the majority of construction vehicles associated with the New Link Road would enter via Discovery Cove, with an expected 50 truck movements per day (ie. 50 in, 50 out). The assessment concluded that this would have a moderate impact when it is considered that these vehicles would be dispersed over the entire day. Nevertheless, a detailed Construction Traffic Management Plan would be developed to ensure that the Discovery Cove Estate and the Stage 1 development can operate satisfactorily, while minimising impacts on Hills Street and Exell Street.

12.4 Assessment of Impacts – Operation

The traffic assessment was undertaken as an iterative process to determine the level of traffic that could be accommodated by the existing road system (as modified). Accordingly, assessment was first made of the impact of the total Project (Stages 1- 3) before confirming the level of development that could be accommodated in Stage 1 prior to the delivery of the new Link Road. Stage 3 was included to reflect the total future traffic generation from the Southlands Site, but the development of Stage 3 is not included in this Application and will be the subject of a later Application.

The assessment is therefore set out in that manner as follows.

12.4.1 Assessment of Operational Impacts - Stage 1

Traffic Impacts

A total of 235 vehicle trips per hour (combined in and out trips) are predicted by applying the Roads and Traffic Authority's 'generic' trip rates to the Stage 1 development area. This is about 50 % of the total Site generation as assessed for the all stages (as described in **Section 12.4.2**).

The traffic impacts would be dispersed to the existing road network, with all entries via Hills Street and all exits via Exell Street. The flow increases do not trigger the need for the proposed New Link Road that is discussed in **Section 12.4.2**. They do however require improvements to the capacity of the Hills-Exell one way system. The proposed improvements (refer to **Figure 5-3**) to these intersections are:

- Hills Street - creation of separate right and left turn entry lanes in Botany Road for movement into Hills Street;
- Hills Street – widening at the entrance to allow two lanes with a merge on approach to McPherson Street; and
- Exell Street and Botany Road intersection - new traffic lights to facilitate right and left turns into Botany Road from Exell Street with pedestrian crossings on all approaches.

The modelling for Stage 1 was based on a 2011 land use scenario being the assumed operation timeframe of Stage 1. The modelling assumed the above improvements were implemented.

The modelling found that these measures provide satisfactory performance under 2011 conditions, with a good 'level of service' at both intersections. The assessment assumed no change at any other intersection.

These works would also have the following benefits on the surrounding network:

- improved safety and efficiency of the Discovery Cove Estate roundabout resulting from the ability of traffic to turn right out of Exell Street into Botany Road under traffic signal control and therefore removing the existing 'U' turn movements;
- reduced existing queues that occur in Exell Street at peak times, as existing merge conflicts would be removed; and
- improved pedestrian safety and amenity through the provision of traffic signals at this intersection which would provide pedestrian crossing facilities across all approaches of the Exell Street / Botany Road intersection.
- Potential implications of these works include:
- traffic would be prevented from turning left from Botany Road into Hills Street from then turning right into Greenfield Street, to avoid a cross-over movement. This is a minor restriction on accessibility and these vehicles would simply need to undertake the short loop using McPherson and Exell Street to access Greenfield Street; and
- vehicles turning right from Botany Road into Hills Street would be able to turn into Greenfield Street as at present. This limitation is considered justified in light of the significant benefits to accessibility to the precinct generally that would be created by the proposed improvements.

The improvements at the intersection of Hills Street and Botany Road and the left turn entry into Hills Street require a slight local widening on the north-west corner to facilitate this movement. This land is under the ownership of the Department of Defence and can be accommodated with minimal impact. Initial contact has been made with the Department of Defence to review the land required and no apparent problems are evident at this stage. Otherwise, the improvements at this intersection can be accommodated within the existing road reservation.

Parking Impacts

Parking is provided for 440 spaces for Stage 1 of the proposed development which is substantially more than that required under the RTA's Guidelines *"Guide to Traffic Generating Developments"* (148 spaces) but less than that recommended under CoBB's Development Control Plan (600 spaces). The assessment considered that all parking demands would be fully accommodated within the Site, with the prospect of spare parking being available. This can be reviewed during subsequent development stages if necessary. The traffic assessment considered CoBB's requirement to be excessive for warehouse uses, particularly considering:

- large warehouse developments typically operate 24 hours per day and 7 days per week, thereby spreading traffic loads and resultant parking demands; and
- warehouse staff are usually rostered over this 24 hour shift which spreads the peak parking demands.

The provision for parking includes disabled parking and visitors parking. Five disabled spaces would be provided in accordance with the minimum requirements of AS 2890.1 and these would be dispersed throughout the Site and be convenient to the offices.

Access and Internal Design

The access and internal design aspects of the proposed Stage 1 development were reviewed and found to comply with the requirements of AS 2890.1 (Off Street Parking) and AS 2890.2 (Commercial Vehicle Facilities). The internal design makes provision for 25 m long B Doubles which is the longest truck expected to require access. The traffic assessment noted that the detailed design of the facility, including driveway crossing levels and on-street parking controls, would need to be reviewed prior to construction.

12.4.2 All project stages

The traffic impact assessment was undertaken for all stages of the development (including the envisaged development in Stage 3) and assumed a total of 465 vehicles / hour during peak periods. This represents a worst-case scenario that potentially overstates the expected level of traffic generation. The estimated 465 vehicles / hour would only occur during peak periods and the majority of these trips are staff arrivals and departures. Flows at all other times would be significantly less.

The traffic assessment considered the predicted 2016 traffic conditions (nominally the operation timeframe for Stage 2/3) based on the results of 2006 surveys. These predictions included the Southlands Project, plus the following additional development:

- proposed Port Botany expansion with new berths that would increase peak hour traffic generation; plus
- development of the Green Square urban renewal project in Zetland with 5,000 residents and an additional 7,000 workforce; plus
- implementation of the Sydney Airport Master Plan with 120,000 m^2 of commercial office space; and
- development of the 33.5 ha Prince Henry Hospital site.

These factors were included in an evaluation of several road link options to address the existing capacity constraints. The evaluation considered both morning and afternoon peak conditions. The new road link options assessed were:

- Option 1: A new access road connecting the existing roundabout access to Discovery Cove (at Botany Road) to McPherson Street;
- Option 2: A new access road connecting McPherson Street to Botany Road at the existing main entrance to the Discovery Cove Estate (located east of the intersection of Botany Road with Foreshore Drive) (note that the portion of Foreshore Road east of Botany Road is in fact part of Botany Road);
- Option 3: A new road access on the alignment of McPherson Street over the railway line connecting to Beauchamp Road at its intersection with Perry Street. This has also been separately assessed for two sub-options with different alignments onto Beauchamp Road, although these do not result in different modelling results beyond the influence of any new intersection; and

- Option 4: Reliance on the existing road access via Hills Street and Exell Street.

These options are described and presented diagrammatically in more detail in **Appendix L**.

In summary, the modelling showed that Option 2 was the preferred arrangement (refer to **Figure 5-5**). This option makes use of the existing Discovery Cove Estate access onto Botany Road via a substantially improved signal-controlled intersection, with a new public road that connects to McPherson Street and extends into the Site. It should also be noted that this linkage is included as a long-term objective of CoBB. Option 2 is preferred as it provides the following benefits:

- it would serve the entire precinct, not just the Project Site;
- the new link would enable bus services to access the industrial precinct north of Botany Road which would result in a significant potential increase in public transport patronage. This can be achieved through the diversion of existing services or the introduction of new services;
- it makes use of an existing intersection and is easily staged;
- the road system has been shown to operate satisfactorily;
- the proposed link is the most direct link to Foreshore Drive, avoiding any unnecessary local traffic diversions either via Botany Road or Beauchamp Road;
- the proximity of the intersection to the existing traffic signals at Botany Road (which is 140 m to the west) has been discussed with RTA officers;
- the proposed link road would take significant pressure off the use of Hills Street and Exell Street which would improve traffic conditions along these existing routes; and
- the difficulties presented by traversing through Discovery Cove have been overcome. In particular, all access to Discovery Cove on both sides of the new link would be via left-in and left-out movements with a central median along the new road. Traffic circulation would be facilitated by a proposed new roundabout at the intersection of the new road with McPherson Street.

A number of potential land access constraints along the New Link Road have also been avoided due to Goodman's earlier involvement during the project conception. Goodman effectively control the entire length of the footprint of the New Link Road and has granted land owners consent as owners of this land for lodgement of this EA. Stage 2 and the New Link Road are subject to the acquisition of land rights.

It is proposed that the New Link Road be considered as part of Stage 2 of the development. Rail access to the Site is not feasible for Stage 1 but could be considered for Stages 2 and 3 depending on user requirements.

12.4.3 Other Possible Improvements

It is noted that there are other possible improvements that can be implemented to improve traffic conditions in the locality. These are mainly required to overcome existing problem areas and it is emphasised that they are not required for the Southlands development at any stage. These improvements have been developed in light of feedback received at public workshops during development of the Environment Assessment and include the following:

- **Botany Road roundabout -** removal of the existing roundabout at the intersection of Discovery Cove with Botany Road and the introduction of priority control with two southbound through traffic lanes in Botany Road and with a right turn bay in Botany Road;
- **Discovery Cove eastern gate on Botany Road** - installation of traffic signals at the intersection of the proposed link road with Botany Road, which would serve Discovery Cove (which is presently served by a left-in/left-out arrangement). This would subsequently be extended to McPherson Street in Stages 2. This would then enable light traffic only to use the western access (with the roundabout removed); and
- **Botany and Foreshore Road Intersection** - construction of an additional southbound lane in Botany Road (eastern side) on approach to Foreshore Drive, enabling four lanes on approach to the intersection comprising a left turn lane, a through lane and two right turn lanes.

These improvements are suggested as possible works to be included in Stage 1 as a public benefit in lieu of a Section 94 contribution, but are not required or put forward as part of the project works for Stage 1. Further consultation and negotiation will occur with CoBB for these additional possible improvements in relation to their acceptance in lieu of Section 94 Contributions.

12.5 Summary of Mitigation Measures

A summary of recommended mitigation measures for traffic management is presented in **Table 12-1**.

Table 12-1 Summary of Traffic Mitigation Measures

Mitigation Measure	Implementation		
	Design	Construction & Soil Remediation	Operation
Provision of proposed improvements at the intersections of Hills Street and Exell Street with Botany Road. – creation of separate right and left turn entry lanes in Botany Road into Hills Street; – widening at the entrance of Hills Street to allow two lanes with a merge on approach to McPherson Street; and – new traffic lights at Exell Street and Botany Road intersection.	✓ (Stage 1)		✓ (Stage 1)
Negotiation of a Voluntary Planning Agreement (or similar arrangement) between the Proponent and CoBB for contribution of the cost of, and the co-development of the New Link Road.	✓ (Stage 2 prior to New Link Road)		
Further consultation with CoBB for contribution of the cost and co-development of the additional possible improvements at the Botany Road roundabout, Discovery Cove eastern gate on Botany Road and Botany and Foreshore Road Intersection.	✓ (Stage 2)		

13.1 Introduction

This chapter provides an overview of the Noise and Vibration Impact Assessment for the Southlands Remediation and Development Project. The assessment was conducted by Heggies Australia Pty Ltd and the complete report is presented in **Appendix M**.

The assessment aimed to identify potential acoustic impacts on the surrounding residential, industrial and commercial receivers. The Noise Impact Assessment was prepared in general accordance with Australian Standard 1055-1997 "*Description and Measurement of Environmental Noise*" Parts 1, 2 and 3 and with reference to the NSW Industrial Noise Policy (INP). Where issues relating to noise are not addressed in the INP, such as sleep disturbance and construction noise, reference has been made to the *NSW Environmental Noise Control Manual* (ENCM) and *Environmental Criteria for Road Traffic Noise* (ECRTN). Assessment of potential vibration impact has been undertaken in accordance with NSW DECC *Assessing Vibration: a technical guideline*.

13.2 Existing Environment

Mixed industrial and commercial receivers surround the Southlands Site. The nearest potentially affected residential receivers are located in Botany to the west and Hillsdale to the east (refer to **Figure 13-1**).

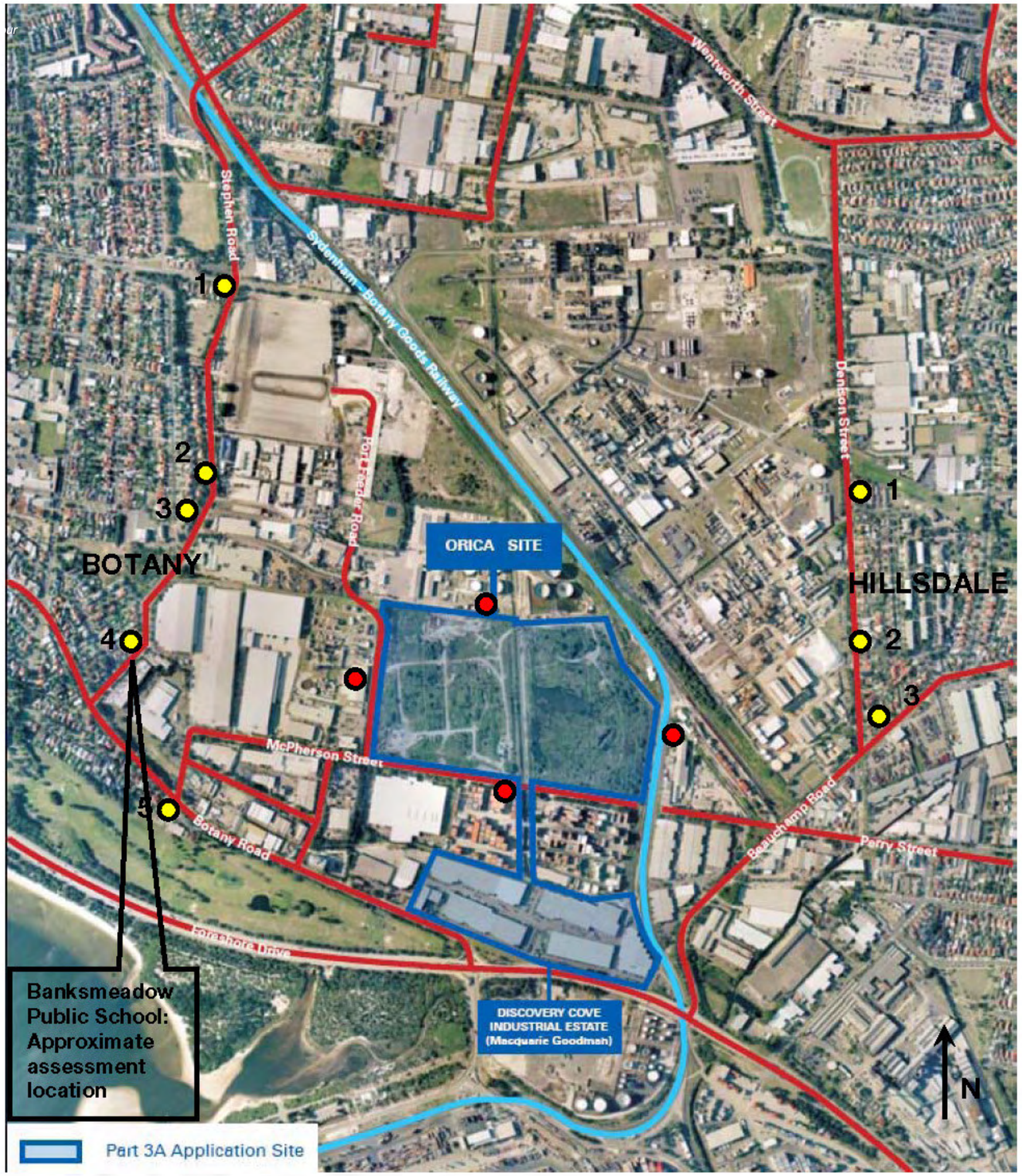
The acoustical environment at both Botany and Hillsdale typifies an urban environment, with heavy and continuous traffic flows from the road, rail and air with residences located near industrial districts. The residences located in these suburbs have therefore been assessed under the "urban" receiver type.

In order to determine existing ambient noise levels in the vicinity of the Site, operator attended noise surveys and unattended noise monitoring were conducted at the nearest existing residential locations. Details of the monitoring locations are provided in **Appendix M** and shown in **Figure 13-1**.

13.3 Construction Noise Impacts

As each proposed stage of the development is constructed, the noise impact on surrounding receivers would change depending on the location of the construction activity. The noise source locations account for the change in noise impact throughout each construction stage as construction activity repositions around the Site as displayed in **Figure 13-2**. Source locations 1 and 2 relate to construction of Stage 1, source location 3 relates to Stage 2 and source location 4 relates to Stage 3 (although approval is not sought in this Application for Stage 3).

Construction noise was predicted at five representative residential locations in Botany and three in Hillsdale. Predictions were also performed at each of the Site boundaries to assess the potential construction noise emissions at surrounding industrial/commercial receivers and the nearest affected school receiver in Botany (Banksmeadow Public School). A summary of the results of these predictions is contained in **Tables 13-1** to **13-3**.



Legend:

Source: Heggies Pty Ltd, 30-1596R1R3(2), 2 October 2007

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Job No: **43217541**	File: 43217541-019.wor	

Client

ORICA AUSTRALIA PTY LTD/
GOODMAN PTY LTD

Project

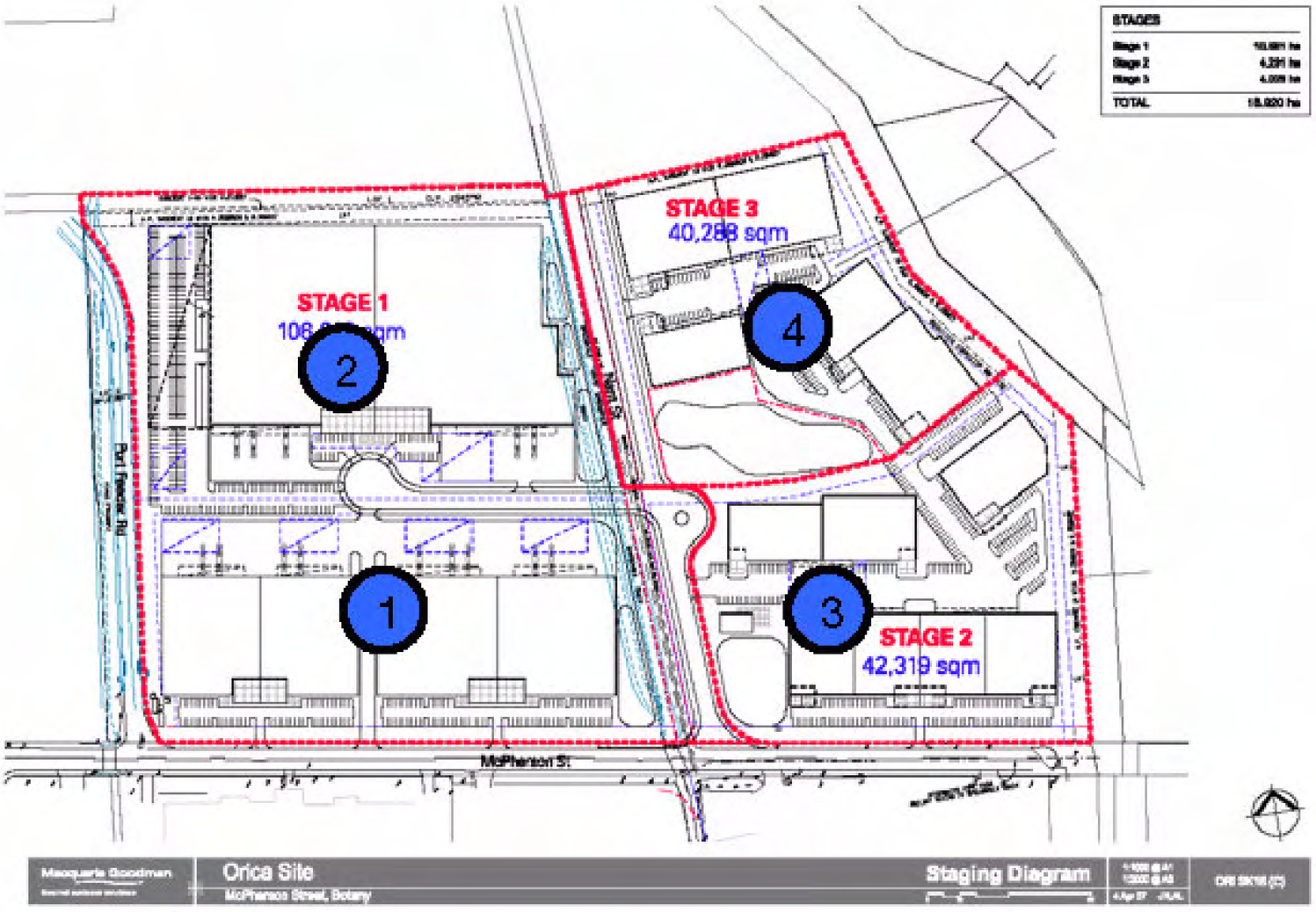
SOUTHLANDS REMEDIATION AND DEVELOPMENT ENVIRONMENTAL ASSESSMENT

Title

NOISE ASSESSMENT LOCATIONS

Figure: **13-1**

URS



n Approximate assessment locations

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Source: Heggies Pty Ltd, 30-1596R1R3(2), 2 October 2007

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GOODMAN PTY LTD

Project

SOUTHLANDS REMEDIATION AND DEVELOPMENT ENVIRONMENTAL ASSESSMENT

Title

CONSTRUCTION NOISE ASSESSMENT APPROXIMATE LOCATIONS

Figure: **13-2**

URS

Chapter 13 Noise & Vibration

Table 13-1 Predicted $L_{Aeq(15minute)}$ Construction Noise Emission – Residential Receivers

Location	Assessment Point	Predicted Noise Level LA_{10} dBA				Construction Design Goal LA_{10} dBA
		Noise Source Location				
		Source 1	Source 2	Source 3	Source 4	
Botany Residential	1	45	46	45	43	**56**
	2	47	54	51	49	
	3	47	55	50	48	
	4	48	47	45	46	
	5	52	48	49	45	
Hillsdale Residential	6	46	48	49	47	**59**
	7	43	44	46	47	
	8	43	43	45	48	

Table 13-2 Predicted $L_{Aeq(15\ minute)}$ Construction Noise Emission - Commercial / Industrial Receivers

Location	Assessment Point	Predicted Noise Level LA_{eq} dBA				Commercial Construction Design Goal LA_{eq} dBA	Industrial Construction Design Goal LA_{eq} dBA
		Noise Source Location					
		Source 1	Source 2	Source 3	Source 4		
Surrounding Commercial / Industrial Receivers	North	57	73	55	58	**70**	**75**
	South	48	40	41	37	**70**	**75**
	East	59	58	75	64	**70**	**75**
	West	41	40	32	34	**70**	**75**

Table 13-3 Predicted $L_{Aeq(15\ minute)}$ Construction Noise Emission - School Receivers

Location	Assessment Point	Predicted Noise Level LA_{eq} dBA				School receiver Construction Design Goal LA_{eq} dBA
		Noise Source Location				
		Source 1	Source 2	Source 3	Source 4	
Banksmeadow Public School	4	38	37	35	36	**40 (internal)**

The assessment concluded that:

- Ambient LA10 noise levels are predicted to meet the relevant criteria at all residential locations during each of the three proposed construction phases.
- The land to the north and east of the Site is classified as industrial and construction noise for Stages 1 to 3 would meet the relevant criteria at all surrounding commercial / industrial receivers.
- Noise emissions during each stage of Southlands construction would meet project specific noise goals when Banksmeadow Public School is in use. A façade noise reduction of 10 dBA was assumed in order to determine compliance with the internal design goal which was noted as conservative and was used to relate the external predicted noise levels to an internal noise levels.

Cumulative Impact

The Southlands Site is situated within an area that encompasses many other industrial and commercial developments.

Potential cumulative noise impacts from existing and successive developments are embraced by the INP procedures by ensuring that the appropriate noise emission criteria (and consent limits) are established with a view to maintaining acceptable noise amenity levels for residences. Therefore, the cumulative impact of the proposed Southlands remediation and redevelopment with existing industrial noise sources has been assessed in the determination of the amenity levels at surrounding potentially noise sensitive areas.

Road Traffic Noise Assessment

The noise assessment noted that the number of vehicle movements proposed during construction at the Site would be significantly less than those which occur during the operational phase of the development. Therefore the impact of noise from construction traffic would be less than that during operation and consequently would result in a negligible increase in existing traffic noise levels.

13.4 Operational Noise Impacts

13.4.1 Background

Given the assumed warehouse based activity on-site, the major noise sources would be delivery vehicles (trucks), during arrival, departure and associated loading and unloading activities. Two situations were modelled to assess a worst case day-time operation and typical 15 minute evening and night time operation. These two scenarios are detailed as follows:

- *AM/PM peak day-time period acoustical scenario* – The peak periods are assumed to be between 7am - 9am and 3pm - 5pm. From these assumed peak periods, a 15 minute average of the proposed peak traffic volume has been determined. In addition, all roof-top plant is assumed to be running at full power throughout the 15 minute period as well as typical 15 minute operational scenario.
- *Evening and night time acoustical scenario* – This is based upon assumed on-site activity during a typical 15 minute period in the evening and night time. All roof-top plant is assumed to be running at full power throughout the 15 minute period.

13.4.2 Predicted Impacts

The predicted noise contribution from each scenario was found to be within INP noise guidelines at the nearest residential and commercial/industrial and school receiver locations.

The results are presented in **Table 13-4, Table 13-5** and **Table 13-6**.

Table 13-4 Predicted $L_{Aeq(minute)}$ Noise Emission – Residential Receivers

Location		Predicted Noise Levels LAeq(15 minute) dBA – Calm Conditions		
		Daytime (Peak Period)	Evening	Night time
Botany	1	30	30	30
	2	34	34	34
	3	35	34	34
	4	33	32	32
	5	34	34	34
Project Specific Noise Goal		**56**	**50**	**45**
Hillsdale	1	33	33	33
	2	32	32	32
	3	31	31	31
Project Specific Noise Goal		**59**	**50**	**45**

Table 13-5 Predicted $L_{Aeq(15minute)}$ Noise Emission – Commercial/industrial Receivers

Location (Site Boundaries)	Period	Predicted Noise Level	Commercial Premises Amenity Criteria	Industrial Premises Amenity Criteria
North	When in use	43 dBA	**65 dBA**	**70 dBA**
South		30 dBA		
East		49 dBA		
West		30 dBA		

Table 13-6 Predicted $L_{Aeq(15minute)}$ Noise Emission – School Receiver

Location (Site Boundaries)	Period	Predicted Noise Level Daytime (peak period)	School Receiver Amenity Criteria
Banksmeadow Public School	Noisiest 1-hour period when in use	33 dBA (external)	**35 dBA (internal)**

Ambient L_{Aeq} operational noise levels are predicted to meet the relevant criteria at all residential, school and commercial and/or industrial receiver locations during the day, evening and night time periods.

Potential for Sleep Arousal

The maximum noise levels produced by potential night time operation of Southlands are below the relevant criteria of 64 dBA. Therefore, the night time operation of the proposed Southlands development is not likely to cause sleep disturbance.

Road Traffic Noise Assessment

Existing road traffic at the nearest residential locations is not expected to be increased significantly by traffic to and from the proposed Southlands Remediation and Development Project (refer to **Chapter 12** for discussion of the traffic impacts). Given the distance of the New Link Road to the nearest affected receivers and the barrier effect of the surrounding commercial/industrial buildings it is highly unlikely that traffic noise produced on this road would impact surrounding residents.

The predicted increases in traffic correspond to a road traffic noise level increase of less than 0.5 dBA. This is seen as a negligible impact to residents located along or near Foreshore Drive / Botany Road.

13.5 Vibration

Due to the large separation distance the level of vibration caused by construction activities / proposed activity at the Southlands Site is predicted to be below the level of human perception at any of the nearest residential or school locations. The construction and operation vibration levels will be significantly below the preferred vibration levels set out in *Assessing Vibration: a technical guideline* produced by DECC.

13.6 Summary of Mitigation Measures

The noise assessment concluded that no noise mitigation measures were necessary.

14.1 Introduction

This chapter presents an overview of the flora and fauna impacts of the Southlands Remediation and Development Project. The flora and fauna assessment was undertaken by URS and is presented in **Appendix N.** A specific assessment of the Green and Golden Bell Frog was undertaken by Biosphere Environmental Consultants (BEC) and is presented in **Appendix O**.

Under Part 3A of the EP&A Act there is no requirement for Section 5A of the EP&A Act to be addressed, hence there is no requirement for a Species Impact Statement (SIS).

Instead, the flora and fauna assessment must be prepared according to the Environmental Assessment Requirements, which refer to the draft *Guidelines for Threatened Species Assessment* (DEC 2005). Notwithstanding the statutory requirements for Part 3A of the EP&A Act, a conservative approach to the flora and fauna assessment has been taken to address Section 5A and complete the Seven Part Test as a guide to assessing impacts on threatened biota that could be affected by the proposal.

14.2 Existing Environment

The ecological and conservation value of the Site is low, with no remnant vegetation, low native species diversity and an abundance of noxious weeds. The Site provides only marginal habitat for local fauna species. The Site's limited ecological value may be attributed to its previous land uses, infestation with exotic flora and fauna, and groundwater contamination.

Six vegetation communities were identified on-site being open grassland dominated by exotic weeds and pasture species; Acacia Open Scrub; Closed Wetland (north western portion of Stage 1); Open Wetland (Paper Waste Ponds); Springvale Drain Aquatic Community and planted open woodland.

14.3 Assessment of Potential Impacts

14.3.1 Areas to be cleared and staging of works

The proposed remediation and development of the Site would ultimately encompass the entire area of the Site.

The assessment of impacts was based on the end point of the proposed development and encompasses Stages 1, 2 and 3 (though it is noted that this application is not seeking approval for Stage 3). Over time, the proposed development would result in the removal of all vegetation within the Site and the in-filling of all wetlands (the Paper Waste Ponds and the Closed Wetland in the north western portion of the Site).

It is noted that as a result of the ACM present on the Site, there are requirements for clearing the site outlined in **Chapter 9** and the RAP (**Appendix H**).

The limited existing vegetation on the Discovery Cove and former MCS site in the footprint of the New Link Road would also be cleared.

14.3.2 Flora

Vegetation at the Site is dominated by environmental weeds and has low ecological value. All vegetation present on the Site would be cleared.

Chapter 14 Flora and Fauna

Due to extensive industrial use, the Discovery Cove Estate contains little native vegetation or potential habitats for threatened species. There is some limited vegetation along Springvale Drain within the former MCS site.

Whilst no offsets against the proposed clearing are likely to be required, there is an opportunity for development to increase ecological values present in the surrounding areas. It is recommended that any landscaping or complementary plantings utilise indigenous native species of local providence (refer also to **Chapter 19**).

14.3.3 Fauna

The proposed development of the Southlands Site would result in the loss of all fauna habitats currently present and directly impact fauna present at the time of development. The fauna species recorded on the Site and those expected to occur are all generally widespread and common. The staged removal of fauna habitats and individuals associated with construction of the proposal would not render any local population or any fauna species extinct within the locality.

No threatened species of fauna listed under the *TSC* or *EPBC Act* were recorded during site surveys conducted for the project. The likelihood of threatened species utilising the Site, and the potential impacts on fauna assemblages are discussed below.

Bats

The assessment concluded that the loss of potential foraging habitat associated with the proposed development is unlikely to have a significant impact on native bats, including local populations of threatened species.

Mammals

Native mammals have not been recorded on the Site. The assessment concluded the loss of habitat associated with development at the Site is not likely to have a significant impact on local populations of native mammals.

Frogs

The Open Wetland, and Exotic Open Grassland areas may intermittently support a local population of the *TSC* and *EPBC Act* listed Green and Golden Bell Frog. A Seven Part Test was conducted and is presented in **Appendix O**. No individuals of this species were recorded during the surveys conducted for this Project. However, it was recommended that two small habitat ponds be constructed as part of the proposal to ensure potential habitat for Green and Golden Bell Frog is maintained on the Site. These have been included in the proposal for Stage 1 as shown in **Figure 5-2**.

DECC has recommended that additional surveys be undertaken for the Green and Golden Bell Frog. The Proponent therefore makes a commitment to undertake additional survey work for the Green and Golden Bell Frog under optimum conditions, prior to commencing any works on the Site. Other frog species observed on the Site are widespread and common. Habitat at the Site is probably of limited value to local populations of these species due to groundwater contamination and the presence of higher grade habitat in the nearby Sir Joseph Banks Park, the Lachlan Swamps and the Botany Wetlands. Therefore the proposed development is likely to have a minor impact upon local populations of native amphibians.

Additionally, Orica has identified that groundwater extraction for the BGC Project has had the effect of significantly lowering the water table. This has been required to achieve containment of the groundwater contamination and has minimised the discharge of shallow groundwater into Springvale Drain and led to significant surface water quality improvements. The implication of this lowering of the water table has meant that the Paper Waste Ponds and the section of Springvale Drain through the Southlands Site are no longer permanent water bodies, but are essentially casual water bodies that exist only for short periods after significant rainfall events. In these circumstances, frog habitat may have already been impacted by the extraction of groundwater for the BGC Project. Nevertheless additional surveys for Green and Golden Bell Frogs would be undertaken prior to any works commencing on Site.

Reptiles

It is likely that some of the more mobile skinks and snakes would relocate when disturbed; however there are limited areas for such movements and it is likely that the development will cause the removal of these species from the Site.

Birds

The assessment concluded that the loss of potential foraging habitat is likely to be negligible in the context of large areas of less disturbed habitat in the local area. Other areas of suitable habitat include Sir Joseph Banks Park, the Lachlan Swamps, the Botany Wetlands and Towra Point Nature Reserve. Given the limited foraging and breeding habitat the Site provides within the context of the local government area the loss of potential habitat for these species is not considered significant. Bird species are highly mobile and so species displaced by the development are likely to relocate to other habitat. This displacement is unlikely to constitute a significant impact on these species. A Seven Part Test for threatened wetland birds and migratory species was conducted (refer to **Appendix N**) and concludes that the proposed works are not likely to impose a 'significant effect' on any 'threatened species, populations or ecological communities' listed under the *TSC Act*.

14.3.4 Springvale Drain

The proposed development of Southlands for this Project would not result in any major modification to the operation of Springvale Drain. Rather it would be maintained as the main drainage line for that catchment and would be cleaned and revegetated to compliment the new development.

Although contaminated, Springvale Drain contains freshwater habitat within the Site and supports an assemblage of aquatic and semi-aquatic plants, particularly at the northern end. However, as the drain is highly disturbed by weed invasion, physical disturbance and contaminated groundwater, its value as freshwater habitat is likely to be very limited.

Development of the Site would maintain existing hydrological flows (by on-site detention) and therefore flows to downstream receptors, including Penrhyn Estuary and Botany Bay, would be largely unchanged for Stage 1. Detailed design of Stage 2 drainage infrastructure would incorporate measures to mitigate potential scouring and sediment impacts at Penrhyn Estuary. Provided that appropriate sediment controls and other mitigation measures identified in **Table 14-1** are followed, development of all Stages is unlikely to have significant impacts on aquatic habitat in Springvale Drain.

14.3.5 Off-site Impacts

The most significant off-site ecological receptor is Penrhyn Estuary and associated aquatic habitats. These include *TSC Act* listed salt marsh and seagrass communities which are present in the inner estuary. The estuary is also of ecological significance to fish and migratory shorebirds including listed threatened species. The approved Port Botany expansion proposal would have an impact on the ecology of Penrhyn Estuary. Nevertheless, the estuary is likely to retain considerable conservation significance.

The potential off-site impacts on Penrhyn Estuary and Springvale Drain associated with the proposed development of Southlands relate to alterations to the hydraulic regime of Springvale Drain and increased erosion or sedimentation.

With regard to changes to hydrology, flood modelling (presented in **Chapter 8** and **Appendix G**) was prepared assuming that current hydraulic flows from the Site are maintained at their current level in Stage 1 based on significant on-site detention incorporated into the design. Flows through Springvale Drain to Penrhyn Estuary would therefore match the existing regime following the proposed development in Stage 1.

Stage 2 works would involve the delivery of new drainage infrastructure to reduce flood impacts for the wider area. The delivery of this new infrastructure has the potential to affect the outlet to Botany Bay and the surrounding Penrhyn Estuary wetlands. Initial modelling and design resolution by Connell Wagner, as part of their flooding and stormwater modelling for the Project (refer to **Appendix G**), confirms that mitigating measures can be incorporated into the final detailed design for the new Stage 2 infrastructure, that would reduce flow and scour impacts in the Penrhyn Estuary. Detailed design and incorporation of these mitigating measures would be required, and proposed as part of the commitments, prior Stage 2 works to ensure that impacts to Penrhyn Estuary are not significant.

With regard to erosion and sedimentation, these potential off-site impacts can be readily managed by the implementation of standard erosion controls for urban developments, such as those detailed in the Landcom (2004) guidelines *Managing Urban Stormwater: Soils and Construction* (the so-called 'Blue Book'). Moreover, erosion controls for the construction phase of the development would be detailed in an erosion and sedimentation control plan, which will form part of the CEMP.

14.4 Mitigation Measures

A summary of the flora and fauna mitigation measures required is presented in **Table 14-1**.

Table 14-1 Summary of Flora and Fauna Mitigation Measures

Mitigation Measure	Implementation		
	Design Stage	Construction and Remediation	Operation Stage
Undertake additional Green and Golden Bell Frog surveys prior to any construction works on the Site.	✓ (Prior to construction and remediation)		
Offset habitat for the Green and Golden Bell Frog in the form of two small frog ponds and associated foraging areas would be constructed and maintained in accordance with the detail provided by BEC (2007) in **Appendix O** and any relevant requirements of the Southlands RAP.	✓ (Stage 1)	✓ (Stage 1)	✓ (Stage 1)
An erosion and sedimentation control plan would be prepared as part of the CEMP in order to prevent potential off-site impacts during remediation and construction works.		✓ (Stage 1 and 2)	
A Weed and Pest Management Plan would be prepared as part of the CEMP and long term EMP for the site. Remediation and construction activities need to limit the risk of spread of Noxious Weed species present on Site.		✓ (Stage 1 and 2)	

Heritage and Archaeology Chapter 15

15.1 Introduction

Given that the Site has been extensively disturbed over many years through previous construction, building and industrial operations, it was concluded that field works would not be required. This assessment has therefore been based on desk-top studies, using available information from a range of sources. These include previous relevant studies and public databases maintained by the CoBB, Department of Environment and Water Resources (now part of the Department of the Environment, Water, Heritage and the Arts), National Trust (NT), NSW Heritage Office and National Park and Wildlife Service (NPWS as part of DECC).

This chapter presents a summary of the desktop assessment of the potential impacts on sites of Aboriginal or non-Indigenous heritage for the Site.

15.2 Site History and the Existing Environment

The Site occupies a region once known as Veterans Swamp, part of the Botany Swamps. This area was not settled until the early 1800s because of the swampy nature of the terrain and the difficult access. Fishing communities established along the northern foreshore of Botany Bay but the swamps were not occupied by settlers until the 1830s. The Botany Swamps had already become important as Sydney's major water supply. Pump houses were built along the Mill Pond. No pumping ever took place from the Veterans Swamp.

In 1830 the southern sections of the Botany swamps were subdivided and land allotments were given to retired officers from the New South Wales Veterans Corp, hence the term 'Veterans Swamp" (Larcombe 1970). This land was later sold and became part of a vast market garden region. By the late 1840s Botany was described as the market garden of Sydney (Aheluk 1994). The success of the gardens was assured by the fertility of the soil and the ready access to water. However, as the push for market land became more strident, drainage canals were constructed to expose more of the peat-rich soil. Under heavy agricultural exploitation, the swamps dried quickly and by the 1860s gardens began to fail through lack of water.

During the draining of the swamp peat lenses were exposed and in several parts of the Botany Swamps (including the Veterans Swamp) peat cutting was carried out on a commercial basis. The Paper Waste Pond on Block 2 of the Site is a remnant from the days of peat extraction. During the 1850s the Springvale and Floodvale drains were excavated. These drains were extended over time and eventually reached their 3 km lengths by the early 1860s. These drains have remained in operation ever since.

As Sydney's water supply became unreliable, the volume of water was variable and the quality of the water declined to be at times undrinkable. Uncontrolled live stock and agriculture had reduced the area around the Botany Swamps to barren ground. Exposed sand dunes were flattened by wind and animals and the swamps silted up. These events forced the government to seek out alternative water sources for the growing city. Weirs were constructed at Eastlakes and the Lower Nepean Water Scheme was initiated (this did not come into effect until 1896).

With market gardening in decline other land uses were sought. Industries, primarily wool scourers, soap and candle makers and tanneries were the first to take up exposed land. By 1886, the largest of these factories, the Floodvale and Springvale Wool Works and Tanneries were operational (Jervis and Flack 1938). The topography of the area changed as low-lying regions were reclaimed and sand dunes levelled.

Chapter 15 Heritage and Archaeology

The tanneries remained in operation until the Second World War. Workers settlements sprung up around the tanneries, mainly along the shores of Botany Bay. Wharves and piers were built along the bay.

With the closure of the tanneries the Southlands area was cleared for other industrial purposes. In the 1950s APM purchased the Site and used it to dump waste paper pulp. APM stored bails of waste paper in parts of Southlands. APM discharged paper waste slurries into some of the ponds and pits that existed in this area, which were formed in early 1960s by the extraction of peat and sand. APM are believed to have used mercury-based fungicides in their manufacturing process. Prior to this the Site was used as a dumping area for boiler ash from the nearby Bunnerong Power Station. This boiler ash was used to fill in Southlands and the adjoining lands south of McPherson Street.

ICI purchased the Site in 1980, intending to develop it as part of the expanding chemical plant at Matraville. A variety of other solid wastes and building rubble have been disposed in Southlands by local industry and others during this period, until the Site was fenced by ICI in 1991. The thickness of this fill is variable ranging between 0.7 and 1.5 m, but is up to 4 m in places. As a result of historical activities, the surface of the Site is uneven, with scattered pond areas and is moderately vegetated with low shrubs and weeds (Biosphere 1996).

15.3 Legislative Requirements and Searches

Any action that is likely to have a significant impact on a World Heritage property or a national heritage place must be referred to the Commonwealth Environment Minister for further consideration.

No Commonwealth listed heritage items are affected by the Project.

15.3.1 NSW Heritage Act 1977

Approval must be gained from the Heritage Council when making changes to a heritage place listed on the State Heritage Register or covered by an interim heritage order. A search was made of the online heritage database on the NSW Heritage Site website. There were no sites listed under the *NSW Heritage Act 1977* on this database at the Southlands Site.

15.3.2 National Parks and Wildlife Act 1974

The surface of the Southlands Site has been completely modified over the history of the Site's use as a commercial peat mine and commercial and industrial area. Further, surface visibility is low due to the presence of weeds and areas of dumped waste covering the majority of the Site. It is considered unlikely that Aboriginal surface artefacts would be present. A search of the DECC Aboriginal Heritage Information Management System (AHIMS) identified one object (shell midden) recorded near, but not on, the Site.

These searches showed no evidence of any known Aboriginal sites located within the Site. Any such sites would most likely have been affected, damaged or destroyed by previous construction and industrial activities, such as:

- market gardening;
- peat cutting and sand extraction;
- waste disposal and storage;
- reworking and levelling of the drainage lines on Site;

- construction of roads and tracks on Site; and
- construction of the Floodvale and Springvale Drains.

15.3.3 Botany Bay Local Environmental Plan 1995

Botany Bay Local Environmental Plan (LEP) contains a list of all its heritage items in Schedule 3 of the Plan. Further, Development Control Plan 37 (DCP 37) outlines the CoBB's Policy Statement on heritage conservation for the LGA and identifies the purpose, principle aims, objectives and statutory context of the DCP which applies to all the properties, buildings and landscapes identified as Heritage Items within the City of Botany as identified in Schedule 3 of the Botany LEP 1995.

The LEP for Botany LGA contains 177 items listed for the heritage value. There are no items listed by the Botany LEP in the vicinity of the development. Nor will any associated activity be likely to have an impact on these listed items. As a result no heritage impact statement or conservation management plans is considered necessary and DCP 37 does not apply to the development.

It is further noted that the LEP for Botany LGA and DCP 37 do not apply to developments seeking approval under Part 3A of the EP&A Act.

15.4 Assessment of Impacts

Based on the results of the relevant database searches, a review of available information, and an assessment of the history of the Site and existing environment and proposed activities, it is considered that impacts on Aboriginal or non-Indigenous heritage items by the development of the Site are unlikely. However, a CEMP would be developed and implemented addressing heritage issues. The CEMP would detail the management strategies to be followed in the event that an Aboriginal object or non-aboriginal archaeological relic is uncovered during construction.

In the event that an Aboriginal object or non-Aboriginal object is uncovered during the construction of the project the following is to be undertaken:

- All works are to be ceased in the vicinity of the object.
- A qualified archaeologist would be called in to assess the significance of the object and a consensus reached on the course of action prior to continuation of the excavation.

These actions should be followed if human skeletal material is detected during development activities:

- If the remains are detected during construction, then no further excavation that involves the removal of in-situ bones would occur until the local Aboriginal community / DECC representatives / NSW Heritage Office have been contacted and consensus is reached regarding the continuation of the excavation.
- Notify immediately the following people of the discovery:
  - the local Police (required by law);
  - a DECC archaeologist or Aboriginal Heritage Officer;
  - a representative from the La Perouse Local Aboriginal Land Council;
  - the NSW Heritage Office; and

– the project archaeologist (if not already present).

- The appropriate authorities and Aboriginal representatives would decide the course of action.

15.5 Mitigation Measures

The safeguards listed in **Table 15-1** would be included in the CEMP.

Table 15-1 Summary of Heritage Mitigation Measures

Mitigation Measure	Implementation		
	Design	Construction and remediation	Operation
The CEMP would be developed and implemented addressing heritage issues. The CEMP would detail the management strategies to be followed in the event that an Aboriginal object or non-aboriginal archaeological relic is uncovered during construction and be incorporated where appropriate into site inductions for site personnel. It would require that any relic uncovered be reported to CoBB and DECC.		✓ (Stage 1 and 2)	

16.1 Introduction

The Botany Bay Planning Region incorporates the Local Government Areas (LGAs) of Sutherland, Kogarah, Hurstville, Bankstown, Canterbury, Marrickville, Rockdale, South Sydney, Randwick and Botany Bay. Three of the major employment-generating activities in the Sydney metropolitan area and NSW are located in the Botany Bay Planning Region. These are the Sydney International and Domestic Airports, Port Botany and the BIP.

This chapter addresses the socio-economic impact of the Project and includes Stage 3 of the Project for the purposes of completeness. It is noted however that Stage 3 development would be the subject of a future Application.

16.2 Existing Socio-Economic Environment

16.2.1 Population

Current

The Southlands Site is located within the Botany Bay LGA and close to the Randwick LGA. According to the Australian Bureau of Statistics Census (ABS, 2007), the population of the Botany Bay LGA in 2006 was 35,993; an increase of 0.2 % from the previous census in 2001. The population of Randwick LGA in 2006 was 119,884; a decrease of 1.3 % since 2001.

The two LGAs form less than 4 % of the 4,119,190 total population of the Sydney area, which grew by 3 % over the same period.

Population density in the two LGAs, at 1,684 people per square kilometre in the Botany Bay LGA and 3,469 people per square kilometre in the Randwick LGA, is much greater than the 349 people per square kilometre average across Sydney as a whole (ABS 2004).

There are no major age distribution differences between the Botany Bay LGA, Sydney and NSW as a whole, as shown in **Table 16-1** (ABS, 2007). Approximately 44 % of the population residing in the Botany area is between the ages of 20-54 which is typical for the rest of Sydney and NSW.

Table 16-1 Age distributions for Botany Bay LGA, Sydney and NSW

Age Group	Botany Bay LGA	Sydney	NSW
0–4	6.5 %	6.6 %	6.4 %
5–14	11.7 %	13.0 %	13.4 %
15–19	12.9 %	13.8 %	13.3 %
20–54	44.0%	44.1 %	42.0 %
55–64	10.6 %	10.2 %	11.0 %
65 and over	14.2 %	12.3 %	13.8 %

Source: Australian Bureau of Statistics, 2006 QuickStats: Sydney (Statistical Division) 27/6/07, Australian Bureau of Statistics, 2006 QuickStats: Botany Bay (Local Government Area) 27/6/07.

More than 40 % of the population of Botany Bay LGA were born overseas, which is reflected in the fact that approximately 50 % of the population are from a non-English speaking background. These figures compare with approximately 30 % and approximately 35 % respectively, for Sydney as a whole.

Chapter 16 Socio Economic

16.2.2 Employment

The workforce in the Botany Bay LGA is approximately 55 % of the total population, with an unemployment rate of 2.8 % in 2006, down from 6 % in 2001. This is very similar to the unemployment rate for Sydney as a whole, at 4.3 %, and reflects the generally buoyant economy in Sydney and Australia as a whole (DEWR, 2006).

The weekly median household income in the Botany Bay LGA is $995, which is just less than that for Sydney as a whole, at $1,154 (ABS, 2007).

Employment breakdown statistics from the 2006 Census were not accessible at the time of writing however, according to the 2001 Census, the main employment sectors in the local government area are wholesale and retail trade (21 %), manufacturing (13 %), property and business services (11 %), transport and storage (10 %), health and community services (8 %), and hospitality services (6.5%). These figures confirm the general trend in the region toward less employment in the manufacturing sector (down from 17 % in 1996), with increases in the service industry, particularly in financial, property, business, recreational and personal services.

Unsurprisingly, given the presence of Sydney Airport and Port Botany, the Botany Bay LGA has the highest percentage of employment in the transport and storage industry sectors for any LGA across Sydney.

Employment by occupation in the 2001 Census is generally well spread across the occupation classifications, with minor changes since 1996—intermediate clerical, sales and service workers (19 %), intermediate production and transport workers (12 %), tradesperson and related workers (12 %), labourers and related workers (11 %) and professionals (13 %).

16.2.3 Forecast Population and Employment Growth

The CoBB Contributions Plan identifies population and employment growth in the period 2005 to 2026 in the Botany LGA. The Contributions Plan indicates residential growth for the period is estimated at 7,986 residents while employment growth is estimated at 5,136 (although this figure includes employment growth in the airport and Port Botany which are outside the jurisdiction of the CoBB). The actual employment growth for the Contributions Plan planning period (2005-2010), as set out in Table 2.6 of the Contributions Plan, is 3,039 residents and 2,415 employees (including those within the Mascot Station Precinct) (as referenced in **Appendix D**).

16.3 Project Components

The total soil remediation and construction cost of the Project when fully developed would be approximately $130 million. The breakdown of this cost is shown in **Table 16-2**.

Table 16-2 Estimate of Approximate Capital Costs

Project Element	Cost
Stage 1	$60,000,000
Stage 2	$45,000,000
Stage 3	$25,000,000
TOTAL	$130,000,000

An estimate of the employment numbers for construction and operation is provided in **Table 16-3**.

Table 16-3 Estimate of Employment

Stage	Construction Employment	Operational Employment
1	110	350
2	100	210
3	100	200
TOTAL	**310**	**760**

Construction of each stage is anticipated to provide employment for approximately 100 staff per stage with a total of some 310 positions.

Once fully constructed (all three stages), it is estimated that the Site would have approximately 760 staff depending on the type of industries that occupy the facility.

16.4 Sydney Metropolitan Strategy

As noted in **Chapter 2**, the Sydney Metropolitan Strategy provides the overarching direction for the growth and development within Sydney over the next 25 – 30 years. Central to the successful implementation of the strategy is the provision of new employment lands and the efficient utilisation of the older existing industrial areas. The Southlands Site is designated as employment land within the Botany Bay Area and part of a larger employment corridor with strong links to Port Botany and Sydney International Airport. The Project directly addresses the objective for employment land supply and addresses the following Metropolitan Strategy objectives:

- Plan for sufficient zoned land and infrastructure to achieve employment capacity targets in employment lands. (Objective A1.2).
- Protect and enhance employment lands of State significance (Objective A1.5).
- Improve planning and delivery of employment lands (Objective A1.6).
- Facilitate the use of old industrial areas (Objective A1.9).

16.5 Assessment of Costs/Benefits

16.5.1 Construction Phase

The construction and commissioning phase of the Southlands Remediation and Development Project is expected to require an increasing workforce through each of the stages, with a peak requirement of an estimated 110 construction personnel.

Construction activities would also generate indirect jobs from the purchase of construction materials, transportation of materials and procurement of services. The payroll and contractors fees from the construction would then be filtered through the economy by induced effects, i.e. effects attributable to expenditure arising from income received during the construction.

Chapter 16 Socio Economic

In summary, the construction and soil remediation phase of the Southlands Remediation and Development Project would be expected to have the following short-term direct economic impacts:

- an injection of capital investment spending of up to $130 million into the region, consisting of construction phase wages and the purchase of local materials and services used during the construction phase;
- the creation of jobs over the construction and soil remediation period as a result of construction activities in the local economy; and
- the provision of salaries and wages to local labour with the potential to increase household spending and demand for goods and services in the local area.

16.5.2 Operational Phase

There would be a number of possible direct economic impacts on the local economy during the operating life of the Project, arising from the expected operating expenditure. These additional direct economic impacts on the local economy include:

- creation of an estimated 200 - 350 jobs for each stage, expected to be recruited locally, for the full-time operation, with the additional wages and salaries injected into the local economy; and
- associated operating expenditure on minor maintenance and equipment / materials purchases would be expected to increase demand for local suppliers and contractors over the operating phase of the project.

The key benefit of the Project would be to make efficient and effective use of a large vacant parcel of industrial land at the heart of Sydney's major industrial and ports precinct. The resulting new industrial estate would have economic benefits associated with the capital expenditure and jobs growth required for construction and operation of the facility.

As an additional benefit, the Project would improve existing traffic problems through works to the intersections of Hills and Exell Streets with Botany Road in Stage 1 and potential for further improvements in Stage 2 through the New link Road between Botany Road and McPherson Street through the existing Discovery Cove Estate. These traffic improvement measures are discussed in more detail in **Chapter 12**.

16.6 Conclusion

The key benefit of the Project would be making efficient and effective use of a large vacant parcel of industrial land at the heart of Sydney's major industrial and ports precinct by creating a new industrial estate and associated employment opportunities. The creation of an industrial estate at this location addresses the State objective for the supply of employment land. The Project has been designed to achieve this objective, while also ensuring that there would be no issues that could cause significant or permanent detrimental social impacts.

The Project would also be expected to provide economic benefits in terms of employment and indirect output generation at the local and regional level. Expenditure on local and imported capital (including natural resources and labour) would generate income for staff employed by the development (direct impacts) and in some additional sectors of the local and regional economy (indirect impacts). It is unlikely that the demographics of the area would alter as a result of the Project.

17.1 Introduction

This chapter presents an overview of the land use safety planning related to the Project. The assessment addresses the development of the entire Site, Stages 1 to 3 although Stage 3 would be the subject of a future Application. The assessment focuses on screening of potential hazards on-site to determine the potential for off-site impacts and any requirement for a Preliminary Hazard Analysis (PHA). The land use safety planning assessment was undertaken by Lloyd's Register (Lloyd's).The complete Land Use Safety Planning Assessment Report is presented in **Appendix P**.

17.2 Consideration of Potential Impacts

17.2.1 Potential Off-site Impacts

The assessment concluded that the low quantities of dangerous goods that are expected to be stored or used on the Site would be below the level at which SEPP 33 applies and therefore do not present a significant off-site risk. Thus it was concluded that a PHA was not required for the proposed use of this site.

17.2.2 Transport of Dangerous Goods

The assessment concluded that the transport of dangerous goods is minimal and does not present a significant transport risk and there is no need to undertake a route selection study.

Delivery of liquefied petroleum gas (LPG) and diesel to the Site would use the existing industrial routes around Port Botany and Banksmeadow for the transport of Dangerous Goods, as outlined in the Department of Planning's draft *Route Selection* guideline.

17.2.3 Potential Conflict between Existing Industrial Hazards and Proposed Future Land Use

A risk assessment was conducted of the risks imposed on the Site by neighbouring industrial properties. Consideration of hazards posed by adjacent industrial operations included the following facilities:

- Orica operations;
- Solvay Interox;
- BIP;
- Mobil Tank Farm; and
- Qenos Tank Farm.

Estimation of Risk Imposed on Southlands

The risk imposed from the neighbouring sites is dominated by the risks associated with the tank farms to the north. The assessment concluded the risk from Orica's ChlorAlkali facility on the BIP and Solvay Interox (to the immediate west of the Site) is very low and complies with the HIPAP No. 4 criterion for adjacent industrial sites.

Chapter 17 Land Use Safety Planning

Assessment of Imposed Risk

The risk from the Mobil Tank Farm and the Qenos Tank Farm is generated by the potential for fires involving the flammable liquids.

The existing land uses around the Site impose risk on the operations of the Project. The magnitude of these risks has been estimated using the available information for these sites (with necessary estimations and assumptions noted). The fatality risks imposed on the Site are generally below the residential criterion of 1×10^{-6} per annum but the northern border experiences higher risk levels up to 50×10^{-6} per annum due to the presence of the storage tanks containing flammable liquids on the Mobil and Qenos sites. Consideration would be given during detailed design for the use of fire resistant wall material for the northern boundary of the north east warehouse building.

However, the risks do not extend greatly into the Site and are able to be mitigated by the design of the proposed warehouse facility. On the north-eastern boundary, the only buildings would be warehouses with blank walls facing the tank farms to the north. All access and egress from the northern buildings is to be from the south, away from the tank farms.

17.2.4 Consideration of previous studies for the area

The previous studies undertaken for the area, including the Port Botany Land Use Safety Study and the Botany/Randwick Industrial Area Study were considered in the assessment and their recommendations examined. The proposed use of the Site is consistent with the recommendations as it does not impose significant risk on the neighbouring properties and also maintains the buffer between the higher risk operations and existing residences.

The assessment concluded that the proposed use of the Southlands Site meets the Land Use Planning requirements of the Director-General described in the Environmental Assessment Requirements.

17.3 Mitigation Measures

A summary of the mitigation measures required is presented in **Table 17-1.**

Table 17-1 Summary of Land Use Safety Planning Mitigation Measures

Mitigation Measure	Implementation		
	Design	Construction and Remediation	Operation
The use of fire resistant wall material would be considered for the northern boundary of the north east warehouse building.	✓ (All stages)	✓ (All stages)	✓ (All stages)
Emergency procedures for the Southlands development would be integrated with the emergency plans for the Mobil and Qenos tank farms, and the BIP Emergency Plan.			✓ (All stages)

18.1 Introduction

This chapter addresses the potential impacts of the generation of waste and wastewater during construction and operation of the Project.

Waste issues associated with contamination on the Site are identified in the RAP which is presented in **Appendix H**.

18.2 Statutory Framework for Waste Management

The principles of waste avoidance, waste reduction, waste reuse and waste recycling would be adopted during the construction and operation of the Project in accordance with the following legislation and policies, which provide the framework for waste management in NSW.

Waste Avoidance and Resource Recovery Act 2001

The objectives of the *Waste Avoidance and Resource Recovery Act 2001* (WARR Act) are to encourage the most efficient use of resources, to reduce environmental harm, and to provide for the continual reduction in waste generation in line with the principles of ecologically sustainable development. To meet the objectives of the WARR Act, a resource management hierarchy has been established, comprising:

- avoiding unnecessary resource consumption;
- recovering resources (including reuse, reprocessing, recycling and energy recovery); and
- disposal (as a last resort).

Protection of the Environment Operations Act 1997

The *Protection of the Environment Operations Act 1997* (POEO Act) provides for licensing and day-to-day regulation of waste in NSW.

Schedule 1 of the POEO Act identifies the waste activities which require licensing

Wastes generated from activities during the operation phase of the Project would not generally be classified as requiring a licence under the POEO Act .

Waste Classification Guidelines: Part 1 Classifying Waste

During April 2008 the DEC NSW Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes (2004) were replaced by the Waste Classification Guidelines: Part 1 Classifying Waste (DECC 2008).

All waste generated by the construction and operation of the Southlands Project which requires off-site disposal would be classified and disposed of in accordance with these guidelines.

National Waste Minimisation and Recycling Strategy

The National Waste Minimisation and Recycling Strategy sets out a hierarchy of waste management priorities for waste minimisation and recycling. In order of importance, these priorities are waste avoidance, waste reduction, waste reuse, waste recycling or reclamation, waste treatment and waste disposal. The Strategy outlines actions and controls aimed at pursuing waste minimisation and recycling objectives.

Chapter 18 Waste Management

Botany Bay Council DCP No.29

The aim of CoBB DCP Waste Guidelines is to reduce the demand for waste disposal. The objectives include maximising re-use and recycling, assist in achieving Commonwealth and State Government waste minimisation targets, to minimise the overall environmental impacts of waste.

18.3 Assessment of Impacts - Construction

18.3.1 Remediation - Stage 1 and Stage 2 - Southlands

Activities during the remediation of Stage 1 and 2 resulting in the generation of waste could include removal and off-site disposal of impacted soils with remediation to derived risk-based concentrations as identified in the Southlands RAP.

Summary of in-situ waste classification

The Southlands RAP (refer to **Appendix H**) conducted a preliminary in-situ waste classifications for the impacted materials to be removed from Blocks 1 and 2 by applying the NSW *Waste Guidelines* (NSW DECC, 2008). A detailed waste assessment and classification was not able to be conducted based on the number of available samples and the volume of material involved. Where required, waste assessment and classification during the works would be undertaken in accordance with the *Waste Guidelines* (NSW DECC, 2008).

The Southlands RAP identified areas of impacted soils and some other more isolated areas where excavation of impacted material for off-site treatment and / or disposal has been nominated.

The preliminary assessment identified the following:

- Some materials would be classified as Scheduled Wastes, for which handling and disposal are controlled under the Environmentally Hazardous Chemicals (EHC) Act 1985.
- Various areas have been identified as corresponding to the restricted solid and hazardous waste classifications outlined in the, NSW DECC, NSW (2008) Waste Classification Guidelines: Part 1 Classifying Waste.
- Following refinement of the lateral extents of the contamination, the impacted materials would be excavated, and where required, the Proponent may request Orica to consider treatment of excavated HCB impacted materials using the DTD plant proposed for establishment on BIP for treatment of other HCB materials. The DTD project is currently subject to assessment by the DoP. Given the timeframe for planning and establishment of that plant, it is considered that the provision of off-site storage (on BIP) is required of excavated wastes, if they are to be treated on BIP. Further advice would be sought from the DECC for assistance in classification of wastes containing Chlorinated Aliphatic Compounds.
- The presence of asbestos in the materials would have implications for the type of waste facility that could accept the waste if sent off-site.
- A waste classification report and management plan would be developed for the areas of contamination. This report would be reviewed by the Site Auditor as part of the Site Audit process leading to issue of the Section A Site Audit Statement(s).

A comprehensive Waste Management Plan would be developed and incorporated in the overall CEMP. The following waste management control measures would be implemented:

- preparation of a comprehensive waste materials handling and recycling plan (Waste Management Plan) by the appointed Remediation Contractor. This would involve the pre-commencement identification of all waste streams to allow development of a comprehensive Waste Management Plan which will minimise wastes from the Site and wherever possible and reasonably practicable, recommend recovery and recycling;
- periodic assessment and review of the Waste Management Plan;
- identification of appropriately licensed waste transporters and waste management facilities for each waste stream; and
- implementation of a system for tracking of all waste movements including contaminated soils.

18.3.2 Construction - Stage 1 and Stage 2 - Southlands

- Activities during construction of Stage 1 and 2 resulting in the generation of waste could include construction material off-cuts, packaging and general building waste.

A Waste Management Plan would be prepared to address the following objectives:

- to comply with all relevant regulatory requirements;
- to minimise volumes of materials disposed off-site; and
- to recover or recycle materials where possible.

Management measures and options for minimising construction wastes would include:

Waste Avoidance

- sourcing of materials in the correct quantities and size;
- ordering pre-cut/pre-fabricated material;
- materials to be fabricated off-site to reduce waste generation;
- materials to be imported in bulk to reduce packaging waste;
- reducing packaging at the source by returning packaging to the supplier where possible, and by purchasing in bulk; and
- undertaking construction activities in the correct order, to minimise potential rework.

Waste Reuse

- reuse of all fill from earthworks on-site where possible within the requirement of the Southlands RAP, to minimise off-site disposal;
- crushing and reuse of existing concrete slab as fill, to avoid off-site disposal;
- reuse timber formwork where possible; and
- use of iron sheeting as formwork.

Waste Recycling

- separation and storage of construction wastes into recyclable and non-recyclable materials in skips;
- requesting cardboard or metal drums that can be recycled, instead of plastic; and
- collection of scrap metals (aluminium, copper, lead, zinc, steel) for recycling off-site.

Waste Disposal

- waste skips to be regularly collected by a licensed waste contractor and transported off-site for disposal to a licensed landfill; and
- any site waste (e.g. concrete slab) to be tested for contaminants prior to off-site disposal, to ensure that a suitable disposal route is used.

18.3.3 New Link Road

Activities during the construction of the New Link Road resulting in the generation of waste would include:

- construction material off-cuts and packaging;
- excavation for foundations;
- demolition of buildings for reconfiguration of the Discovery Cove Estate to allow construction of the New Link Road; and
- demolition of foundations and pavements in the former MCS site and the Discovery Cove Estate to allow construction of the New Link Road.

The demolition of buildings for reconfiguration of the Discovery Cove Estate and demolition of foundations and pavements to allow construction of the road in the former MCS site/ Discovery Cove Estate would be managed in a manner that minimises disposal of waste and encourages reuse where practicable. Demolition activities are likely to generate wastes such as concrete, steel, glass and timber. The Waste Management Plan, as described in **Section 18.3.2** would set out measures to minimise the generation of waste and promote the reuse, recycling and reprocessing of both construction waste.

The remedial approach for the New Link Road would identify areas of impacted soils and a proposed management strategy for these soils. Following this, a Comprehensive Waste Management Plan would be developed, if required, and incorporated into the CEMP.

18.4 Assessment of Impacts - Operation

All stages

The impacts during operation are likely to be consistent across operation of all stages and are likely to include general waste and recyclables.

The following provides a summary of the waste management and disposal measures to be implemented to achieve waste minimisation and responsible waste disposal during the construction and operation of Southlands Project.

A comprehensive Waste Management Plan would be developed and incorporated in the overall OEMP. A detailed Waste Management Plan would be submitted with the Construction Certificate to set out methods for managing waste in accordance with the principles of the *Waste Avoidance and Resource Recovery Act 2001*, including:

- Waste Avoidance: Avoid generating the waste in the first instance;
- Reuse: Reusing waste within the project or elsewhere or supplying it to other industrial users in Botany area;
- Recycle: Recovery of waste for recycling off-site, in the same or different form; and
- Disposal, as the final stage following the above waste minimisation and reuse actions.

The Waste Management Plan would set out measures to minimise the generation of waste and promote the reuse, recycling and reprocessing of both construction and operation waste. The Waste Management Plan would outline the employees' and contractors' requirements for waste disposal, including keeping waste separated for ease of reuse and recycling.

Table 18-1 describes the operational anticipated volumes of waste, storage and treatment and destination.

Table 18-1 Operational Waste Management Methodology - Stage 1

Type of waste to be generated	Expected volume per week	Proposed on-site storage and treatment facilities	Destination
Offices			
Garbage	2.8 m^3 per week	The offices will be equipped with separate waste receptacles to allow source separation. Waste will be transferred to waste storage bins adjacent to each warehouse	To be determined.
Recyclable (paper and card board)	2.8 m^3 per week		
Warehouses			
Garbage	6.0 m^3 per week	Separate waste bins located in each warehouse.	To be determined
Recyclable	24.0 m^3 per week		

18.5 Wastewater

18.5.1 Construction

Given the known contamination status of shallow groundwater, the CEMP would make provision to preclude (or at least significantly minimise the potential for) interception of shallow groundwater during excavations. The CEMP would provide contingency planning for the potential interception of shallow groundwater during excavation works.

The safeguards which will be implemented to prevent sediment entering surface waters are similar to those listed for the soil and erosion controls. In the event that groundwater is intercepted through excavation, it would not be purged from the excavations for disposal. The excavation would be backfilled such that the base of the excavation is reinstated to above the groundwater table.

Chapter 18 Waste Management

18.5.2 Operation

Domestic

All ablutions would be connected to the sewer system.

Trade Waste

Where appropriate, tenants would obtain Trade Waste Agreements from Sydney Water.

18.6 Mitigation Measures

A summary of the waste mitigation measures required is presented in **Table 18-2**.

Table 18-2 Summary of Waste Management Measures

Mitigation Measure	Implementation		
	Design	Construction and Remediation	Operation
Develop a Waste Classification Report and management plan for contaminated wastes. Report would be reviewed by the Site Auditor as part of Site Audit process leading to issue of the Section A Site Audit Statement(s).	✓ (Stage 1 and 2)	✓ (Stage 1 and 2)	
Develop and implement a Waste Management Plan, as part of the CEMP addressing, the principles of avoid, reduce reuse and disposal. The Plan would also address waste classification and management issues as identified in the Southlands RAP.	✓ (Stage 1 and 2)	✓ (Stage 1 and 2)	
Develop and implement a Waste Management Plan, as part of the CEMP addressing, the principles of avoid, reduce, reuse and disposal. The Plan would address waste classification and management issues identified in the remedial approach for the New Link Road.	✓ (New Link Road)	✓ (New Link Road)	
Water management would be addressed in the CEMP that identifies the issues described in the Southlands RAP and the requirements for contingency planning for interception of groundwater during excavation works and water management to prevent surface run off from becoming contaminated as a result of soil disturbance or contact with site contaminants.	✓ (Stage 1 and 2)	✓ (Stage 1 and 2)	
Develop a Waste Management Plan, as part of the OEMP.			✓ (Stage 1 and 2)

Landscape and Visual Impact Chapter 19

19.1 Introduction

This chapter addresses the landscape and visual impact of the Project focussing on the landscape design concept for the total project (including the future Stage 3). This chapter presents a summary of the landscape design report prepared by Habitation and the full report is presented in **Appendix Q**.

A landscape design has been prepared for the Site dealing with the entire site plan as well as more detailed landscape plans for Stages 1 and 2.

19.2 Existing Environment

The Site has been subjected to substantial disturbance associated with its previous industrial land use, with waste dumping, removal of vegetation, removal of soil and placement of imported fill material. As a consequence, the Site contains very limited visual and landscape appeal. The Site is located on McPherson Street, Banksmeadow which services a number of industrial and commercial developments. The Site is only viewed by motorists and pedestrians travelling to those sites as it is not a main thoroughfare.

The surrounding visual catchment is dominated by a mix of industrial buildings and installations. The landscape treatment for the Site needs to be appropriate for this context.

19.3 Design Principles

The proposed landscape design addresses the Site with particular attention to creating an attractive street frontage and central core visible to the gateway street and responding to flooding issues in relevant areas on the Site. Similarly it seeks to screen and soften the interface with the surrounding harsh industrial context.

The landscape design for the Site addresses the requirements of the relevant CoBB Development Control Plans and provides an attractive feature to this industrial/commercial development.

The following design principles have been incorporated into the proposed development:

- implementing various forms of landscape and screening around the Site boundaries and areas that are evident from the public roads;
- providing focus at the entrance on McPherson Street through detailed landscaping and by providing an attractive and visually enticing street frontage;
- designing pathways and landscaping to facilitate access within the Site and to reinforce the safety of staff and vehicular movements on-site;
- providing staff recreation areas as open space grassed areas and embankments where possible;
- providing variety in the landscape to capture the character of the Botany Area and the evolution of the surrounding neighbourhood areas; and
- providing feature planting which would be positioned to reflect building forms and the themes for the precinct.
- The landscape masterplan is presented in **Figure 5-4**.

Chapter 19 Landscape and Visual Impact

19.4 Landscape Design

19.4.1 All stages

The landscape design for the overall Site (including the future Stage 3) is presented in more detail in the *Landscape Masterplan* which accompanies this application.

19.4.2 Stage 1 and 2

The landscape design for Stages 1 and 2 is presented in more detail in the *Landscape Project Approval Plans*.

19.5 Mitigation Measures

A summary of the recommended landscape and visual mitigation measures is presented in **Table 19-1.**

Table 19-1 Summary of landscape and visual mitigation measures

Mitigation Measure	Implementation		
	Design	Construction and Soil Remediation	Operation
Implementation of the landscape design as shown in the Landscape Plans for the project.	✓ (All stages)		✓ (All stages)
Implementation of a landscape maintenance program upon completion of construction.			✓ (All stages)

Water and Energy Efficiency Chapter 20

20.1 Introduction

This chapter presents a brief overview of the key water and energy efficiency measures proposed for the Project. The assessment was conducted by Connell Wagner Pty Ltd and the full report is presented in **Appendix R**.

A water and energy strategy has been prepared for the total Project and specific measures have been identified for Stages 1 and 2 of the Project. The Strategy would be advanced in the subsequent Stage 3 development but this would be the subject of a future Project Application.

20.2 Operation Impacts

The key considerations in relation to water and energy efficiency principles for the development include:

- solar access and evaluation of overshadowing of adjoining properties;
- energy efficiency influences on the design in terms of building form and construction;
- incorporation of natural ventilation as a passive cooling strategy;
- justification of heating, air conditioning and hot water system requirements and selection;
- energy efficient lighting systems; and
- use of water efficiency systems and appliances and rainwater harvesting for use in non potable applications.

One of the possible water conservation options is the use of the treated water from the Orica GTP. The GTP is currently treating groundwater to a quality that can be beneficially used for a wide variety of purposes. It may be used for non-potable uses including industrial applications (especially where there is high water use potential), toilet flushing, landscape irrigation and fire fighting (backup tank top up).

20.3 Mitigation Measures

The key water and energy efficiency measures would be implemented to ensure Minimum Performance criterion in accordance with the CoBB Energy Efficient Development Control Plan. As summary of the water and energy efficiency measure is presented in **Table 20-1**.

Chapter 20 Water and Energy Efficiency

Table 20-1 Summary of Mitigation Measures

Mitigation Measure	Implementation			
	Design	Construction and Soil Remediation	Operation	Post
Buildings would be designed to maximise the benefits of solar energy through appropriate orientation.	✓ (All stages)		✓ (All stages)	✓ (All stages)
Detailed design would be in accordance with CoBB DCP for Energy Efficiency.	✓ (All stages)		✓ (All stages)	
Use of recycled water on site for non-potable uses proposed from stormwater / rainwater harvesting and from the Orica GTP where possible.	✓ (All stages)		✓ (All stages)	✓ (All stages)
Energy efficient appliances would be installed.	✓ (All stages)		✓ (All stages)	✓ (All stages)

21.1 Introduction

This chapter details the Draft Statement of Commitments in accordance with section 75F (6) of the EP&A Act. The inclusion of appropriate environmental management measures into the detailed design and construction of the project would minimise adverse impacts on the environment. The proposed adoption of the relevant measures identified in the Draft Statement of Commitments into a Construction Environmental Management Plan (CEMP) and Operational Environmental Management Plan (OEMP) would be an important component of the proposal and reiterate the commitment of the Proponent and their contractors to mitigate the environmental impacts identified in this assessment.

The Draft Statement of Commitments describes the environmental management and monitoring to be undertaken during the construction and operation of the Project.

21.2 Environmental Management

21.2.1 Construction Environmental Management Plan

Environmental management during the construction phase of the proposed project would be undertaken in compliance with the requirements of a Construction EMP (CEMP). The CEMP is an administrative tool outlining environmental management practises, safeguard measures to be implemented, the timing of their implementation, and management and monitoring of the process and procedures. The CEMP must be adhered to during the construction of the Project.

The key objectives of the CEMP would include:

- ensuring that works are carried out in accordance with appropriate environmental statutory requirements, the conditions of approval for the project, relevant guidelines and existing environmental management systems and procedures;
- ensuring that works are carried out in accordance with the goals and requirements presented in the Environmental Assessment;
- ensuring that works are carried out in such a way as to minimise the likelihood of environmental degradation occurring;
- ensuring that works are carried out in such a way as to manage the impact of the works on neighbouring land uses;
- ensuring that all employees engaged in the works comply with the terms and conditions of the CEMP;
- providing clear procedures for management of environmental impact including corrective actions; and
- identifying management responsibilities and reporting requirements to demonstrate compliance with the CEMP.

The CEMP would serve as a working document to be used during the implementation of the proposal and updated for each stage of works.

Chapter 21 Draft Statement of Commitments

Generally the CEMP includes:

- establishment of environmental goals and objectives;
- conditions of project approval;
- lists of actions, timing and responsibilities;
- identification of areas of responsibility for environmental management of the project;
- statutory requirements – licences and approvals required;
- a structured reporting system detailing all relevant matters on a regular basis;
- procedures and forms for documentation and reporting of issues;
- training of personnel in environmental awareness;
- guidelines for emergencies, contact names and corrective actions for non-conformance and notifications to appropriate authorities and affected parties;
- auditing implementation of the CEMP;
- review procedures and protocols for modification of the CEMP;
- complaint handling procedure;
- site management and control procedures; and
- monitoring procedures.

Specifically, the CEMP would provide management actions in relation to:

- erosion and sediment control;
- surface water management;
- waste generation and disposal;
- flora and fauna management;
- Aboriginal cultural heritage;
- the control of atmospheric emissions;
- the control of construction traffic movements;
- the control of noise emissions; and
- the control of access to contaminated groundwater.

21.2.2 Operational Environmental Management Plan

An OEMP would be prepared for the long term operational management of the proposed development.

Issues such as the following would be addressed in the OEMP:

- operational waste management; and
- landscape maintenance and management including weed and pest control.

The OEMP would also reference or annex the Long Term EMP required by the Southlands RAP and any long term requirements identified in the remedial approach for the New Link Road. A Long Term Environmental Management Plan (EMP) would be prepared to ensure activities which could potentially result in exposure of future land users to the contained ACM impacted soils, contaminated groundwater beneath the Site, and / or groundwater vapours are precluded or limited / controlled. The specific requirements of the Long Term EMP for these issues are outlined in the Southlands RAP. It is noted that the Long Term EMP is a separate document to the overall Operational EMP (OEMP). The Long Term EMP is required as part of the remediation process to address specific requirements of DECC endorsed guidelines listed under Section 105 of the CLM Act.

Given the staged nature of the development and the requirement for audit statements to be prepared for each stage, the Long Term EMP would initially be prepared to cater for the requirements related to Stage 1 land use scenario, including the use of the Stage 2 area for Stage 1 compensatory flood water detention. Following completion of Stage 2, the Long Term EMP would either be updated to cater for Stage 2 specific requirements or a separate plan would be prepared. The Long Term EMP would be reviewed by the Site Auditor as part of the Site Audit process leading to the issue of Section A Site Audit Statement(s).

21.3 Environmental Safeguards

A number of environmental safeguards and mitigation measures to prevent or minimise environmental impacts that may be generated by the construction and operation of the Southlands development are proposed. These measures would be incorporated into the CEMP(s), OEMP and Long Term EMP.

Table 21-1 summarises these safeguard measures, sets out priorities for implementation (construction and operation) and the relevant stage, and lists the responsibility for ensuring that these safeguard procedures are undertaken. It is noted that where the table references *'All stages'* this refers to Stage 1, and Stage 2.

Chapter 21 Draft Statement of Commitments

Table 21-1 Summary of Environmental Safeguard Measures

Mitigation Measure	Implementation			Responsibility
	Design	Constr. / Remed.	Operations	
GENERAL				
The Proponent would carry out construction and operation generally in accordance with the: – Project Application; – Development Plans; – EA; and – Agreed Statement of Commitments.	All stages	All stages	All stages	Proponent
The Proponent would ensure that all buildings are designed and constructed generally in accordance with the plans provided as part of the Application, the Building Code of Australia and the relevant parts of the EP&A Act building certification.	All stages	All stages		Proponent
Maintain the GTP throughout and following implementation of the Southlands Remediation and Development Project in accordance with the terms of the Orica NCUA or other regulatory requirements.	All stages	All stages	All stages	Orica
Implement and maintain an active vapour mitigation system (such as shallow groundwater extraction system) aimed at reducing the discharge of contaminated shallow groundwater into Springvale Drain and hence reducing the potential for volatile emissions from surface waters to ambient air in the vicinity of the Drain. This would be implemented by Orica through a separate approvals process under the NCUA.	Prior to Stage 1	All stages	All stages	Orica
A detailed monitoring well replacement program would be developed for the Southlands Site to provide a documented framework that ensures Orica's ongoing responsibilities under the NCUA for hydraulic and chemical monitoring can be met both during the construction stages of the development and during the future land use. This would be implemented by Orica through a separate approvals process under the NCUA.	All stages	All stages	All stages	Orica
A series of easements would be granted on the Southlands Site in favour of Orica for use in both groundwater monitoring and extraction as well as for future remediation technologies, should such become available or relevant to remediation of the site and/or other areas in BIP in accordance with *Drawing SRD 017 (A)*.	All stages	All stages	All stages	Proponent

Mitigation Measure	Implementation			Responsibility
	Design	Constr. / Remed.	Operations	
Prepare and implement: – a CEMP; and – an OEMP. Which include the specific measures outlined in the following sections of this table.	All stages	All stages	All stages	Proponent
Preparation and implementation of Communications Plan including the requirements of the Southlands RAP to notify site neighbours and the wider community of construction timing and progress; • mechanisms for submitting feedback and asking questions regarding the project; • reporting progress via Orica's monthly columns in the Southern Courier and St George and Sutherland Shire Leader newspapers; and • maintaining project information on the Orica Botany Transformation Projects webpage.	All stages	All stages		Orica
HYDROLOGY AND FLOODING				
Detailed design of Compensatory Flood Storage Area Groundwater Reticulation System to prevent groundwater discharge into the area and prevent mixing of groundwater with contained flood waters. This would be reviewed by the Site Auditor as part of the Site Audit process leading to the issue of the Section A Site Audit Statement(s).	Prior to Stage 1			Proponent / Contractor
Design of development would ensure no major adverse flood impacts on adjoining landholdings (either upstream or downstream).	All stages	All stages		Proponent
Detailed design of Stage 2 drainage infrastructure to incorporate measures to mitigate potential scouring and sediment impacts at Penrhyn Estuary.	Prior to Stage 2			Proponent
Design of development would ensure no adverse impacts on stormwater quality through incorporation of appropriate stormwater quality control measures as shown on *Civil Drawings.*		All stages		Contractor / Proponent
Negotiation of a Voluntary Planning Agreement (or similar arrangement) between the Proponent and CoBB for contribution of the cost and co-development of the additional drainage infrastructure in Stage 2.	Stage 2 & Link Road			Proponent
Undertake further more detailed design and resolution of issues with Sydney Water for the bridge crossing of the Sydney Water SWSOOS. Undertake negotiations with a number of stakeholders including property owners, CoBB and asset managers to formulate a detailed plan.	Stage 2 & Link Road			Proponent

Chapter 21 Draft Statement of Commitments

Mitigation Measure	Implementation			Responsibility
	Design	Constr. / Remed.	Operations	
SOILS, GEOLOGY AND CONTAMINATION				
The requirements of the Southlands RAP would be implemented as detailed in **Appendix H** and the conditions of the Section B Site Audit Statement (**Appendix I**).	All stages	All stages	All stages	Proponent
The review of further studies and plans required under the Southlands RAP would be undertaken as part of the Site Audit process leading to issue of the Section A Site Audit Statement(s) by the Site Auditor.	All stages	All stages	All stages	Proponent
The review and approval of further studies and plans required under the Southlands RAP would be undertaken as part of the Site Audit process leading to issue of the Section A Site Audit Statement(s) by the Site Auditor.	Stage 1 and 2	Stage 1 and 2	Stage 1 and 2	Proponent
Issue of Section A Site Audit Statement(s) to establish site suitability for the proposed land use.			Prior to occupation of each stage	Proponent
The CEMP would address soil and erosion control as identified in the Southlands RAP. Stage 2/3 area would have erosion and sediment controls implemented prior to Stage 2/3 being developed.		All stages		Proponent / Contractor
The CEMP would address soil and erosion control as identified in the remedial approach for the New Link Road.		New Link Road		Proponent / Contractor
The Communications Plan would ensure effective and efficient consultation with stakeholders for the duration of the soil remediation works as provided in the Southlands RAP (**Appendix H**).	All stages	All stages		Orica
A detailed physical barrier design would be prepared prior to implementation of the remedial approach. Design of the proposed vapour mitigation measures for future site buildings/structures would be completed prior to implementation of the remedial approach. These designs would be reviewed by the Site Auditor as part of the Site Audit process leading to the issue of the Section A Site Audit Statement(s).	All stages	All stages		Proponent / Contractor
All underground services beneath, and in the environs of, Southlands would be mapped and documented. This is required to avoid intercepting services during remediation works that require excavation, as well as to enable incorporation of service and easement locations into the long term EMP.	All stages	All stages	All stages	Proponent / Contractor

Mitigation Measure	Implementation			Responsibility
	Design	Constr. / Remed.	Operations	
A Site Specific Health, Safety and Environment Plan (SSHSEP) would be prepared and implemented for the site in accordance with the framework described in the Southlands RAP (Appendix H).	All stages	All stages		Proponent / Contractor
A Long Term EMP would be prepared and implemented to ensure activities which could potentially or directly result in exposure of future land users to the contaminated soils beneath the physical barrier are precluded or limited / controlled and to include the requirements outlined in the Southlands RAP. This would be reviewed by the Site Auditor as part of the Site Audit process leading to the issue of the Section A Site Audit Statement(s).			All stages	Proponent
A remedial approach would be developed for the New Link Road Site to address the issues identified in the Phase 2 investigation. This would be prepared and approved to the requirements of a DECC accredited Site Auditor before the issuance of the Construction Certificate for the New Link Road.		New Link Road		Proponent
AIR QUALITY				
Develop and implement an Air Quality Management Plan as part of the CEMP to manage and mitigate dust and other air quality issues and address the requirements for measures and monitoring outlined in the Southlands RAP.		All stages		Proponent / Contractor
A Vapour Intrusion Conceptual Model and detailed design of the Vapour Intrusion Mitigation Measures for Site Structures would be prepared for review and approval by the Site Auditor as part of the Site Audit process leading to issue of the Section A Site Audit Statement(s) by the Site Auditor.	Stage 1 and 2		Stage 1 and 2	Proponent
The long term EMP will include additional contingency measures to be finalised following further air sampling after the proposed infilling of the re-alignment channel.	All stages	All stages	All stages	Proponent
TRAFFIC AND TRANSPORTATION				
Provision of proposed improvements at the intersections of Hills Street and Exell Street with Botany Road. – creation of separate right and left turn entry lanes in Botany Road into Hills Street; – widening at the entrance of Hills Street to allow two lanes with a merge on approach to McPherson Street; and – new traffic lights at Exell Street and Botany Road intersection.	Stage 1		Stage 1	Proponent

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Mitigation Measure	Implementation			Responsibility
	Design	Constr. / Remed.	Operations	
Negotiation of a Voluntary Planning Agreement (or similar arrangement) between the Proponent and CoBB for contribution of the cost of, and the co-development of the New Link Road.	Prior to Stage 2 / New Link Road			Proponent
Further consultation with CoBB for contribution of the cost of, and the co-development of the additional possible improvements at the Botany Road roundabout, Discovery Cove eastern gate on Botany Road and Botany and Foreshore Road Intersection in lieu of Section 94 Contributions.				Proponent
FLORA AND FAUNA				
Undertake additional Green and Golden Bell Frog surveys prior to any construction works on the site.	Prior to Construction & Remediation			Proponent
Offset habitat for the Green and Golden Bell Frog in the form of two small frog ponds and associated foraging areas would be constructed and maintained in accordance with the detail provided by BEC (2007) in **Appendix O** and any relevant requirements of the Southlands RAP.	Stage 1	Stage 1	Stage 1	Proponent
A Weed and Pest Management Plan would be prepared as part of the Construction Environmental Management Plan and Environmental Management Plan for the Site. Caution is required during all remediation and construction activities to limit the risk of spread of Noxious Weed species present on Site.		All stages		Proponent
HERITAGE AND ARCHAEOLOGY				
A CEMP would be developed and implemented addressing heritage issues. The CEMP would detail the management strategies to be followed in the event that an Aboriginal object or non-aboriginal archaeological relic is uncovered during construction and be incorporated where appropriate into site inductions for site personnel. It would require that any relic uncovered be reported to COBB and DECC.		All stages		Proponent
LAND USE SAFETY PLANNING				
The use of fire resistant wall material would be considered for the northern boundary of the north east warehouse building.	All stages	All stages	All stages	Proponent
Emergency procedures would be integrated with the emergency plans for the Mobil and Qenos tank farms, and the BIP Emergency Plan.			All stages	Proponent

Mitigation Measure	Implementation			Responsibility
	Design	Constr. / Remed.	Operations	
WASTE MANAGEMENT				
Develop a Waste Classification Report and management plan. These would be reviewed by the Site Auditor as part of the Site Audit process leading to issue of the Section A Site Audit Statement(s).	All stages	All stages		Proponent
Develop and implement a Waste Management Plan, as part of the CEMP addressing the principles of avoid, reduce reuse and disposal. The Plan would also address waste management issues as identified in the Southlands RAP.	All stages	All stages	All Stages	Proponent
Develop and implement a Waste Management Plan, as part of the CEMP addressing, the principles of avoid, reduce reuse and disposal. The Plan would address waste management issues as required by the remedial approach for the New Link Road Site.	New Link Road	New Link Road		Proponent
Water management would be addressed in the CEMP that identifies the issues described in the Southlands RAP and the requirements for contingency planning for interception of groundwater during excavation works and water management to prevent surface run off from becoming contaminated as a result of soil disturbance or contact with site contaminants.	All stages	All stages		Proponent
Develop a Waste Management Plan as part of the OEMP for operation.				Proponent
LANDSCAPE AND VISUAL				
Implementation of the landscape design as shown in the Landscape Plans for the project (07_011 STG 1_LC01 – 5).	All stages		All stages	Proponent
Implementation of a landscape maintenance program upon completion of construction.			All stages	Proponent
WATER AND ENERGY EFFICIENCY				
Buildings would be designed to maximise the benefits of solar energy through appropriate orientation.	All stages	All stages	All stages	Proponent
Detailed design would be in accordance with CoBB DCP for Energy Efficiency.	All stages	All stages	All stages	Proponent
Use of recycled water on site for non-potable uses proposed from stormwater / rainwater harvesting and, if practicable, from the Orica GTP where possible.	All stages	All stages	All stages	Proponent
Energy efficient appliances would be installed.	All stages	All stages	All stages	Proponent

Chapter 22 Conclusion

This Environmental Assessment has addressed the impacts of the Project with regard to the principles of ecologically sustainable development and addressed the impact of the Project on the biophysical and physical environment.

22.1 Ecologically Sustainable Development

The Environmental Planning and Assessment Regulation 2000 requires that an Environmental Assessment include:

"The reasons justifying the carrying out of the development or activity in the manner proposed having regard to biophysical, economic and social considerations and the principles of ecologically sustainable development."

The principles of Ecologically Sustainable Development, as listed in the Regulation, are as follows:

- “The precautionary principle - namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.
- Inter-generational equity - namely, that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.
- Conservation of biological diversity and ecological integrity.
- Improved valuation and pricing of environmental resources."

22.1.1 Precautionary Principle

The Proponent’s precautionary approach is demonstrated by the design and management controls to be implemented as part of the Project.

Monitoring of the effectiveness of the proposed management controls would be carried out in accordance with regulatory and licence requirements. Where deviations from expected conditions are recorded, the matter would be investigated immediately and appropriate action taken as necessary, to prevent any adverse environmental impact as required by the Environmental Management Plans (Construction and Operation) for the proposed Southlands Project.

22.1.2 Inter-Generational Equity

The proposed development of the Southlands Site seeks to make efficient and effective use of a large vacant parcel of industrial land. It also seeks to achieve a collaborative soil remediation and redevelopment of the Southlands property whilst enabling the ongoing groundwater cleanup by Orica.

The Southlands Site contains infrastructure required for Orica’s ongoing groundwater remediation works. The proposed development would in no way compromise Orica’s commitment to the Botany Groundwater Cleanup Project.

22.1.3 Conservation of Biological Diversity and Maintenance of Ecological Integrity

The proposed remediation and development of the Southlands Site is proposed to be staged in a manner that will allow Orica to meets its environmental obligations. In addition, Orica's obligations with respect to the Site include performing further investigations and trialling removal technologies for groundwater contaminant source areas beneath Stage 3 prior to development in Stage 3 and maintaining the GTP throughout and following implementation the Southlands Remediation and Development Project in accordance with the terms of the Orica NCUA or other regulatory requirements.

Although the ecological and conservation value of the Site is low, and no Green and Golden Bell Frog individuals were recorded two small habitat ponds would be constructed as part of the proposal to ensure potential habitat for Green and Golden Bell Frog is maintained on the Site.

Flows through Springvale Drain to Penrhyn Estuary for Stage 1 would match the existing regime. Detailed design of Stage 2 drainage infrastructure would incorporate measures to mitigate potential scouring and sediment impacts at Penrhyn Estuary.

A CEMP for the Site would contain appropriate safeguards to ensure that the proposed development does not result in downstream impacts on sensitive receptors during construction.

22.1.4 Improved Valuation and Pricing of Environmental Resources

It is difficult to assign a monetary value to the environment of the locality, given the lack of precedence and guidelines in the valuation of environmental resources not considered for commercial use. The approach taken would be to manage any environmental impacts by identifying appropriate mitigation measures to minimise adverse environmental impacts and including the cost of these safeguards in the total project cost.

22.2 Summary of Environmental Assessment Findings

A brief summary of the main findings of the Environmental Assessment is presented below. Detailed descriptions of each aspect are presented in the separate sections of the Environmental Assessment and the associated reports presented as appendices. Details of environmental management and monitoring techniques and the commitments made by the Proponent which would be implemented for the proposed Southlands Remediation and Development Project are presented in **Chapter 21.**

22.2.1 Biophysical Environment

The Southlands Site is contaminated site with low ecological and conservation value. Studies conducted on the flora and fauna of the area indicate that no rare, endangered or threatened species are likely to be impacted adversely by the proposed development. However, mitigation measures would be implemented during both the construction and operational phases of the project, to improve the ecological integrity of the Site. A conservative approach has been taken with respect to Green and Golden Bell Frog, and although no individuals were recorded on the Site, allowance has been made for two ponds to create habitat within the development.

Chapter 22 Conclusion

Due to extensive industrial use, Discovery Cove contains little native vegetation or potential habitats for threatened species. There is some limited vegetation along Springvale Drain within the former MCS site proposed for the New Link Road.

22.2.2 Physical Implications

The physical implications of the development relate to the contamination of the Site and the impacts on air, noise, water and flooding. The physical implications of the development have been considered in particular with the development of the RAP and the HHRA in tandem for the Site. The RAP and HHRA provided a framework for remediation and development of the Site so it is suitable for the proposed commercial / industrial development land use. Where appropriate, environmental safeguards in the form of mitigation measures have been recommended to minimise the environmental effects of the Project.

22.2.3 Resource Implications

The Southlands Site is a vacant portion of industrial land at the heart of Sydney's major industrial and ports precinct. The development would make efficient and effective use of a large vacant parcel of industrial land at the heart of Sydney's major industrial and ports precinct while addressing the state objective for the supply of employment land.

22.2.4 Community Effects

The air, noise, traffic and land use safety implications of the project have been considered in this Environmental Assessment. The assessment considered that the potential impacts could be managed through the implementation of mitigation measures described in this assessment.

Specifically, measures for local intersection upgrades of Hills Street and Exell Street with Botany Road would mitigate the traffic impacts of Stage 1 of the project. Stages 2 and future Stage 3 would be facilitated by the proposed new access road connecting the Southlands Site with Botany Road to be constructed as part of the Stage 2 development.

The noise impacts of the construction and operation of the site were found to be negligible and no mitigation measures were considered necessary.

As noted above, the RAP and the HHRA were developed in tandem for the Site and have provided a framework for remediation and development of the Site so it is suitable for the proposed commercial / industrial development land use. Where appropriate, safeguards in the form of mitigation measures have been recommended to minimise the effects of the Project.

22.3 Conclusion

Project Approval under Part 3A of the EP&A Act is being sought by the Proponent for the construction and operation of a new industrial warehousing facility at the Southlands Site at Banksmeadow, NSW.

Mitigation measures to ensure impacts to both the bio-physical and socio-cultural environment remain at an acceptable level throughout the planned lifespan of the development have been factored in to the proposal in the following ways:

- incorporation of appropriate measures into the proposed design of the development; and

- adherence to Environmental Management Plans (EMP) including a Construction EMP and Operation EMP, which would dictate the specific environmental policies and management plans that the facility would operate in accordance with.

The Environmental Assessment has been produced to ensure that the following regulatory and community requirements have been addressed:

- Environmental Planning and Assessment Act 1979;
- Consideration where applicable of State Environmental Planning Policies and Regional Environmental Plans;
- specific requirements identified by the Department of Planning Director – General; and
- local residents and businesses.

Having regard to the Environmental Assessment findings and the principles of ESD, the reasons justifying the carrying out of the development in the manner proposed are as follows:

- environmental issues associated with the proposed development have been fully considered;
- potential impacts identified are capable of being mitigated and the proposed development does not represent a threat of serious or irreversible environmental damage; and
- biological diversity and ecological integrity of the area would not be affected by the proposed development.

Environmental impacts associated with the proposed development have been identified and addressed in this Environmental Assessment according to the Environmental Assessment Requirements issued by Department of Planning. Where appropriate, environmental safeguards in the form of mitigation measures have been recommended to minimise the environmental effects of the project.

No significant adverse environmental impacts have been identified through the course of studies that cannot be appropriately managed and mitigated. Environmental impacts that have been identified comply with relevant standards and are capable of being mitigated through the use of appropriate environmental controls.

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Project Management Team

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Specialist Studies

Section 94 Contribution Report	Connell Wagner
BCA Report	Dix Gardner Pty Ltd
Infrastructure Services Report	Connell Wagner
Hydrology and Flooding	Connell Wagner
Remediation Action Plan Southlands Remediation and Development Project (with Human Health Risk Assessment)	URS Australia Pty Ltd
Section B Site Audit Statement for Remediation Action Plan Orica Southlands	C M Jewell and Associates Pty Ltd
Phase 1 and Limited Phase 2 Environmental Site Assessments (ESA) for the areas occupied by the proposed New Link Road	URS Australia Pty Ltd
Regional Air Quality	Holmes Air Sciences
Traffic and Transport Assessment	Traffix Traffic and Transport Planners
Noise Assessment	Heggies Pty Ltd
Flora and Fauna Assessment	URS Australia Pty Ltd
Green and Golden Bell Frog Assessment	Biosphere Environmental Consultants
Land Use Safety Planning	Lloyd's Register Rail
Landscape Report	Habitation Pty Ltd
Water and Energy Efficiency Report	Connell Wagner