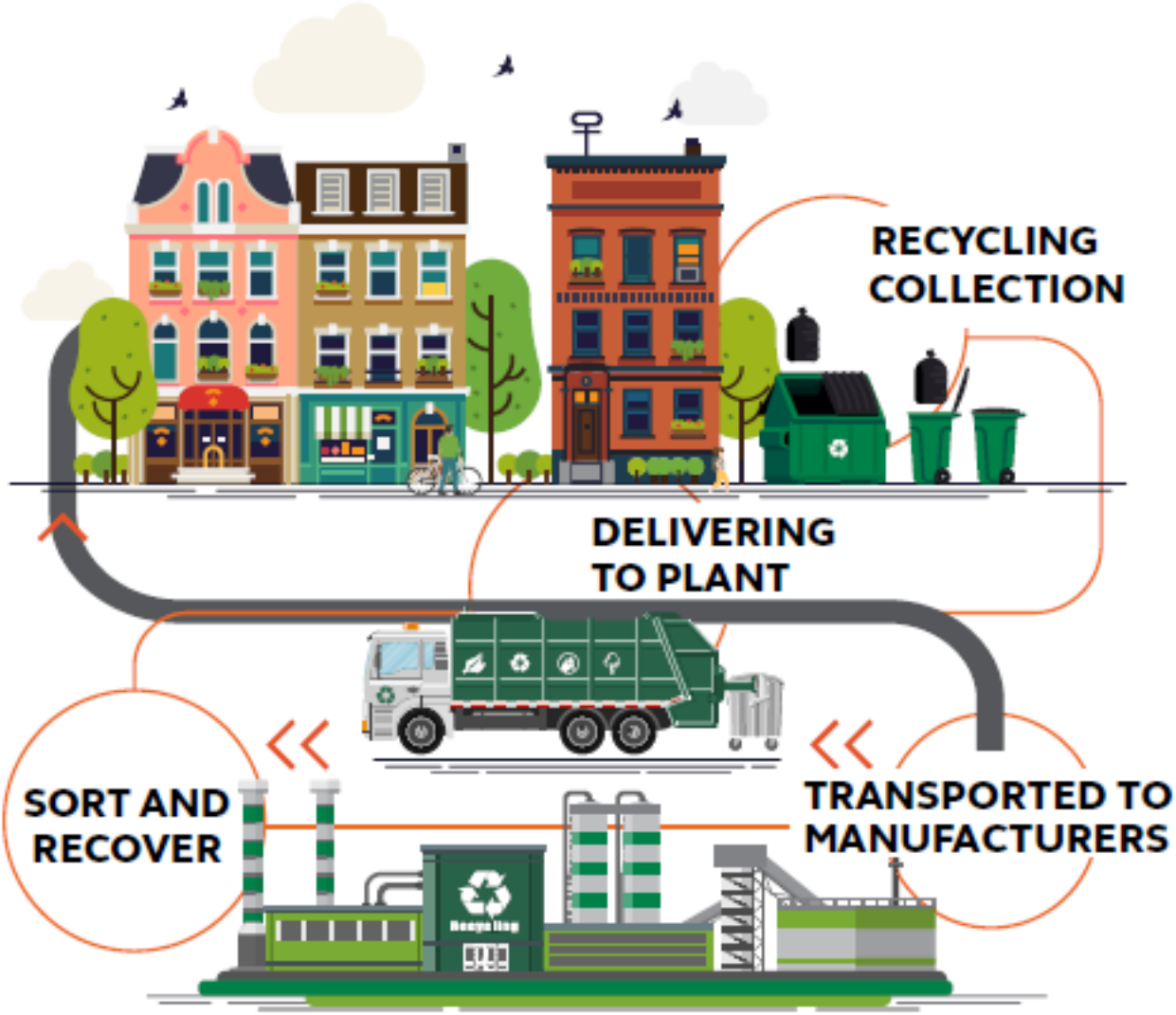
Chullora Materials Recycling Facility

Environmental Impact Statement (SSD-10401)

August 2020



SUEZ RECYCLING & RECOVERY PTY LTD

CHULLORA MATERIALS RECYLING FACILITY

Environmental Impact Statement

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Report No	1
Date	6/08/2020
Revision Text	B

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REVISIONS

Revision	Date	Description	Prepared by	Approved by
A	29/05/2020	EIS for test of adequacy	MWR, CH	BS, KM
B	06/08/2020	EIS for exhibition	MWR, CH	BS, KM

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STATEMENT OF VALIDITY

Submission of Environmental Impact Statement **Prepared under Part 4, Division 4.7 (State Significant Development) of the *Environmental Planning and Assessment Act 1979***	
Environmental Assessment prepared by	
Name:	Claire Hodgson
Qualifications:	Bachelor of Arts (Environmental Studies) Master of Environmental Planning
Address:	Level 16, 580 George Street, Sydney
In respect of:	Chullora Materials Recycling Facility
Applicant Name:	SUEZ Recycling & Recovery Pty Ltd
Applicant Address:	Level 4/3 Rider Blvd, Rhodes NSW 2138
Proposed development:	The Proposal would comprise the construction and operation of a Materials Recycling Facility (MRF) with a material handling capacity of up to 172,000 tonnes per annum. The key construction components of the Proposal would include: • Establishment of a hardstand area and internal road network • Construction of the enclosed MRF shed • Installation and commissioning of fixed plant and equipment • Installation of ancillary infrastructure, including weighbridges, gatehouse, pedestrian overbridge, and fire systems • Installation and connection of site service infrastructure (electrical, water, sewer, gas and telecommunication services) • Installation of signage. The key operational components of the Proposal would include: • Operation of a MRF (including processing and waste delivery and collection) 24 hours per day, seven days per week • Product storage.
Land to be developed:	The Proposal site is located at 21 Muir Road and wholly contained within Lot 2 DP 1227526. This land, as well as the adjacent Lot 100 DP 1245807, has been owned by Frasers Property since 2016. The Proposal site is leased back to SUEZ; however, the adjacent Lot 100 DP 1245807 has been subdivided and separately developed by Frasers Property for purposes of the PFD Storage Warehouse. Landowners consent is provided in Appendix D of this EIS.
Environmental Impact Statement:	An Environmental Impact Statement (EIS) is attached which addresses all matters in accordance with Part 4 (Division 4.7) of the *Environmental Planning and Assessment Act 1979* and Schedule 2, Part 3, clause 7(1)(e) of the *Environmental Planning and Assessment Regulation 2000*. I certify that I have prepared the contents of this EIS in accordance with the Secretary's Environmental Assessment Requirements (SEARs) (Ref SSD-10401) dated 20 May 2020, and that to the best of my knowledge, the information contained within this EIS is not false or misleading.

Submission of Environmental Impact Statement

Prepared under Part 4, Division 4.7 (State Significant Development) of the *Environmental Planning and Assessment Act 1979*

Signature:	
Name:	Claire Hodgson
Date:	6/08/2020

GLOSSARY OF TERMS

Term	Description
ACHAR	Aboriginal Cultural Heritage Assessment Report
ACM	Asbestos Containing Material
ADG Code	Australian Code for Transportation of Dangerous Goods by Road and Rail
AEP	Annual Exceedance Probability
AF/FA	Asbestos fines / friable asbestos
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information Management System
ALEP	Auburn Local Environmental Plan 2010
ANZECC	Australian and New Zealand Environment and Conservation Council
AOBCs	Areas of Outstanding Biodiversity Values
APCO	Australian Packaging Covenant Organisation
Applying SEPP 33	*Applying SEPP 33: Hazardous and Offensive Development Application Guidelines* (Department of Planning, 2011a)
Approved Methods	*Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (NSW EPA, 2016)
AQIA	Air Quality Impact Assessment
Arcadis	Arcadis Australia Pacific Pty Ltd
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
ARR Guidelines	Australian Rainfall and Runoff Guidelines (Geoscience Australia, 2019)
ARTC	Australian Rail Track Corporation
As	arsenic
AS	Australian Standard
ASC NEPM	*National Environment Protection (Assessment of Site Contamination) Measure 1999*
ASI	Area of Social Influence
ASS	Acid Sulphate Soils
ATC	Automatic Tube Counts
AUD	Australian Dollars
Bankstown DCP	Bankstown Development Control Plan 2015
BaP TEQ	benzo(a)pyrene toxic equivalence factor
BAM	Biodiversity Assessment Method

Term	Description
BBWQIP	Botany Bay and Catchment Water Quality Improvement Plan
BC Act	*Biodiversity Conservation Act 2016*
BCA	Building Codes of Australia
BDAR	Biodiversity Development Assessment Report
bgl	below ground level
BLEP 2015	Bankstown Local Environmental Plan 2015
BOA	Building over and adjacent
BoM	Bureau of Meteorology
BTEX	Benzene, Toluene, Ethylbenzene, Xylene
C&I	Commercial and Industrial
CBD	Central Business District
Cd	cadmium
CEMP	Construction Environmental Management Plan
CH_4	methane
CLM Act	*Contaminated Land Management Act 1997*
CMA	Catchment Management Authority
CO	carbon monoxide
CO_2	carbon dioxide
CO_2-e	carbon dioxide equivalents
COAG	Council of Australian Governments
COPC	Contaminants of Potential Concern
Costin Roe	Costin Roe Consulting Pty Ltd
Council	Canterbury-Bankstown City Council
CSPS	Community and Stakeholder Participation Strategy
Cr	chromium
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CTMP	Construction Traffic Management Plan
Cu	copper
DA	Development Application

Term	Description
dBA	Decibels, A-weighted
DCPs	Development Control Plans
DDT	dichlorodiphenyltrichloroethane
DEC	Department of Environment and Conservation (NSW)
DECC	Department of Environment and Climate Change (NSW)
DECCW	Department of Environment, Climate Change and Water (NSW)
DGV	Default Guideline Values
DIPNR	Department of Infrastructure, Planning and Natural Resources (NSW)
DLWC	Department of Land and Water Conservation (NSW)
DoAWE	Department of Agriculture, Water and Environment (Commonwealth)
DoP	Department of Planning (now Department of Planning, Industry and Environment) (NSW)
DotEE	Department of Environment and Energy (now the Department of Agriculture, Water and the Environment) (Commonwealth)
DP	Deposited Plan
DPI	Department of Primary Industries (NSW)
DPIE	Department of Planning, Industry and Environment (NSW)
EEC	Endangered Ecological Community
EES Group	Environment Energy and Science Group within the Department of Planning, Industry and Environment
EIS	Environmental Impact Statement
ELCAR	Electric carriage
Element	Element Environmental
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000*
EPA	Environment Protection Authority (NSW)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EPIs	Environmental Planning Instruments
EPL	Environmental Protection Licence
ERA	Environmental Risk Analysis
ESCP	Erosion and Sediment Control Plan
ESD	Ecologically Sustainable Development

Term	Description
FERP	Flood Emergency Response Plan
Flood mitigation works	The flood mitigation works proposed under DA 366/2020 to be developed across the Chullora RRP site prior to the commencement of the construction of the Proposal
FRL	Fire Rating Level
FRNSW	Fire and Rescue NSW
ft	foot
FTE	Full-time Equivalent
GDE	Groundwater Dependent Ecosystems
GFA	Gross Floor Area
GHG	Greenhouse gas
GIL	Groundwater Investigation Levels
GIS	Geographic Information System
GJ	gigajoules
GML	General Mass Limit
GPT	Gross Pollutant Trap
GST	Goods and services tax
ha	hectares
HDPE	High Density Polyethylene
Heritage act	*Heritage Act 1977 (NSW)*
Hg	mercury
HILs	Health Investigation Levels
HSLs	Health Screening Levels
Hz	hertz
IBRA	Interim Biogeographic Regionalisation for Australia
ICNG	Interim Construction Noise Guideline
IFD	Intensity Frequency Duration
ISEPP	*State Environmental Planning Policy (Infrastructure) 2007*
Katestone	Katestone Environmental Pty Ltd
kg	kilogram
kL	kilolitres

Term	Description
km	kilometres
km/hr	kilometres per hour
KN	kilonewtons
$ktCO_2$-e	kilotonnes of carbon dioxide equivalent
kwh/yr	kilowatt hours per year
L	litre
LAeq	Equivalent continuous sound level
LEP	Local Environmental Plan
LGA	Local Government Area
LoS	Level of Service
LSPS	Local Strategic Planning Statement
m	metres
m^3	cubic metres
mg	milligrams
MLA	Metropolitan Levy Area
mm	millimetres
mm/s	millimetres per second
MNES	Matters of National Environmental Significance
MRF	Material Recycling Facility
MRL	Metro Rail Line
MRV	Medium Rigid Vehicle
MSW	Municipal Solid Waste
$MTCO_2$-e	million tonnes of carbon dioxide equivalent
Mtpa	million tonnes per annum
MUSIC	Model for Urban Stormwater Improvement Conceptualisation
N_2O	Nitrous oxide
NCAs	Noise Catchment Areas
NCC	National Construction Code
NE	Noise Enhancing

Term	Description
NGER	*National Greenhouse and Energy Reporting Act 2007*
NH_3	ammonia
Ni	nickel
NML	Noise Management Level
NO_2	Nitrogen dioxide
NO_x	Nitrous oxides
NPfI	Noise Policy for Industry (EPA, 2017)
NPI	National Pollutant Inventory
NSW	New South Wales
NSW AIP	New South Wales Aquifer Interference Policy
NTC	National Transport Commission
NVIA	Noise and Vibration Impact Assessment
OC/OP	Organochlorine / Organophosphorus Pesticides
OCC	Old Corrugated Cardboard
OEH	Office of Environment and Heritage (NSW)
OEMP	Operational Environmental Management Plan
OH&S	Occupational Health and Safety
ONP	Old newspaper
OSD	Onsite detention
OTMP	Operational Traffic Management Plan
ou	Odour units
PAH	Polycyclic Aromatic Hydrocarbons
Pb	lead
PCB	Polychlorinated Biphenyls
PCT 715	*Broad-leaved Ironbark - Melaleuca decora shrubby open forest on clay soils of the Cumberland Plain, Sydney Basin Bioregion*
PCTs	Plant Community Types
pcu	passenger car units
PET	Polyethylene Terephthalate
PFAS	Per- and polyfluoroalkyl substances

Term	Description
PHA	Preliminary Hazard Analysis
PIRMP	Pollution Incident Response Management Plan
PM	Particulate matter
PM_{10}	Particulate matter - 10 micrometres or less in diameter
$PM_{2.5}$	Particulate matter - 2.5 micrometres or less in diameter
PMF	Probable Maximum Flood
POEO (Waste) Regulation	*Protection of the Environment Operations (Waste) Regulation 2014*
POEO Act	*Protection of the Environment Operations Act 1997*
PPE	Personal Protective Equipment
PP	Polypropylene
PPV	Peak Particle Velocity
previous Chullora RRC	The previous Chullora Resource Recovery Centre operated by SUEZ until 2017
PSM	Pells Sullivan Meynink
Pty Ltd	Property Limited
Rail Corp	Rail Corporation New South Wales
RAP	Remediation Action Plan
RBL	Rating Background Level
RL	Reduced level
RNP	Road Noise Policy
Roads Act	*Roads Act 1993*
RRC	Resource Recovery Centre
RRP	Resource Recovery Park
RTA	Roads and Traffic Authority
SAR	Site Audit Report
SAS	Site Audit Statement
SEARs	Secretary's Environmental Assessment Requirements
SEED	Sharing and Enabling Environmental Data
SEPP	State Environmental Planning Policies

Term	Description
SEPP (State and Regional Development)	*State Environmental Planning Policy (State and Regional Development) 2011*
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*
SES	State Emergency Service
SIA	Social Impact Assessment
SIA Guideline	Social Impact Assessment Guideline (NSW DPIE, 2017)
SO_2	Sulphur dioxide
SSD	State Significant Development
SSFL	Southern Sydney Freight Line
SSI	State Significant Infrastructure
STFM	Strategic Traffic Forecasting Model
SUEZ	SUEZ Recycling & Recovery Pty Ltd (the Applicant)
SWL	Sound power levels
TCA	Transport Construction Authority
TCPs	Traffic Control Plans
TEC	Threatened Ecological Community
TfNSW	Transport for New South Wales
The Chullora RRP	The Chullora Resource Recovery Park
The Chullora RRP site	The Chullora RRP is the single parcel of land; being 21 Muir Road, Chullora (Lot 2 DP1227526)
TIA	Traffic Impact Assessment
TN	Total nitrogen
TOU	The Odour Unit
TP	Total phosphorus
tpa	tonnes per annum
tph	tonnes per hour
TRC	TRC Environmental Corporation
TRH	Total Recoverable Hydrocarbons

Term	Description
TSC Act	*Threatened Species Act 1995 (repealed)*
TSP	Total suspended particles
TSS	Total suspended solids
TTPP	The Transport Planning Partnership
VENM/ENM	Virgin Excavated Natural Material and Excavated Natural Material
VIS	Vegetation Information System
VOCs	Volatile Organic Compounds
WARR	Waste Avoidance and Resource Recovery
WARR Act	*Waste Avoidance and Resource Recovery Act 2001*
WHS Act	*Work Health and Safety Act 2011*
WM Act	*Water Management Act 2000*
WoNS	Weeds of National Significance
WSUD	Water Sensitive Urban Design
WWII	World War Two
Zn	zinc

ENVIRONMENTAL IMPACT STATEMENT SUMMARY

Introduction

This Environmental Impact Statement (EIS) has been prepared on behalf of SUEZ Recycling & Recovery Pty Ltd (SUEZ - the Applicant) to support a State Significant Development (SSD) application under Part 4, Division 4.7 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). Division 4.7 of the EP&A Act identifies the Minister for Planning and Public Spaces, through the New South Wales (NSW) Department of Planning, Industry and Environment (DPIE), as the consent authority for development that is identified as SSD.

SUEZ is seeking to establish a state-of-the-art resource recovery park (RRP) located at 21 Muir Road (Lot 2 DP 1227526), Chullora. As part of this, SUEZ is proposing to design, build and operate the first phase of the Chullora RRP as a Materials Recycling Facility (MRF) (the Proposal) to process co-mingled non-putrescible recyclable municipal solid waste (MSW) and dry commercial and industrial (C&I) waste; with a material processing capacity of up to 172,000 tonnes per annum (tpa).

This EIS has been prepared by Arcadis Australia Pacific Pty Limited (Arcadis) on behalf of the Applicant to support an application for the approval of the Proposal. It has been prepared in accordance with the Amended Secretary's Environmental Assessment Requirements (SEARs) issued on 20 May 2020 by the DPIE, the EP&A Act and Schedule 2 of the *Environmental Planning and Assessment Regulations 2000* (EP&A Regulations).

Proposal site description

The Chullora RRP, including the Proposal site, would be developed on a 9.2 hectare (ha) single parcel of land; being 21 Muir Road, Chullora (Lot 2 DP 1227526) (the Chullora RRP site). This site is located within the Chullora Technology Park in the Canterbury-Bankstown Local Government Area (LGA), approximately 18 kilometres (km) west of Sydney Central Business District (CBD) and 10 km east of Parramatta CBD. The Chullora RRP would be developed in stages, with the Proposal representing the first stage.

The Proposal site is bounded by Muir Road to the north, Anzac Street to the east and existing industrial development further east and to the south. Surrounding the Proposal site is a range of industrial developments including PFD Storage Warehouse and Volkswagen Distribution Centre to the north, the Tip Top Bakery and News Limited warehouses to the east, and the BlueScope Steel warehouse and Veolia Greenacre Transfer Station to the south. Directly to the west of the Proposal site is a narrow strip of land owned by the Rail Corporation NSW (RailCorp), which comprises part of the former railway which previously operated through this area. A number of other businesses are located further to the west, including a service station, fitness centre and a range of other industrial warehouses. The closest residential receivers are located in the suburbs of Yagoona, approximately 455 metres (m) to the southwest, and Greenacre, approximately 600 m to the east of the Proposal site.

The Chullora RRP site, including the Proposal site, was previously operated as the Chullora Resource Recovery Centre (previous Chullora RRC), which was owned and operated by SUEZ from 2011 until 2016 when the property was acquired by Frasers Property and leased back to SUEZ. The facility included a Transfer Station, MRF, Garden Organics platform and a glass processing building. The previous Chullora RRC was the subject of a fire in 2017 and subsequently demolished.

On the 12th May 2020 SUEZ lodged a development application (DA) 366/2020 with Canterbury-Bankstown City Council (Council) for the development of flood mitigation works across the Chullora RRP site (the flood mitigation works). The flood mitigation works include:

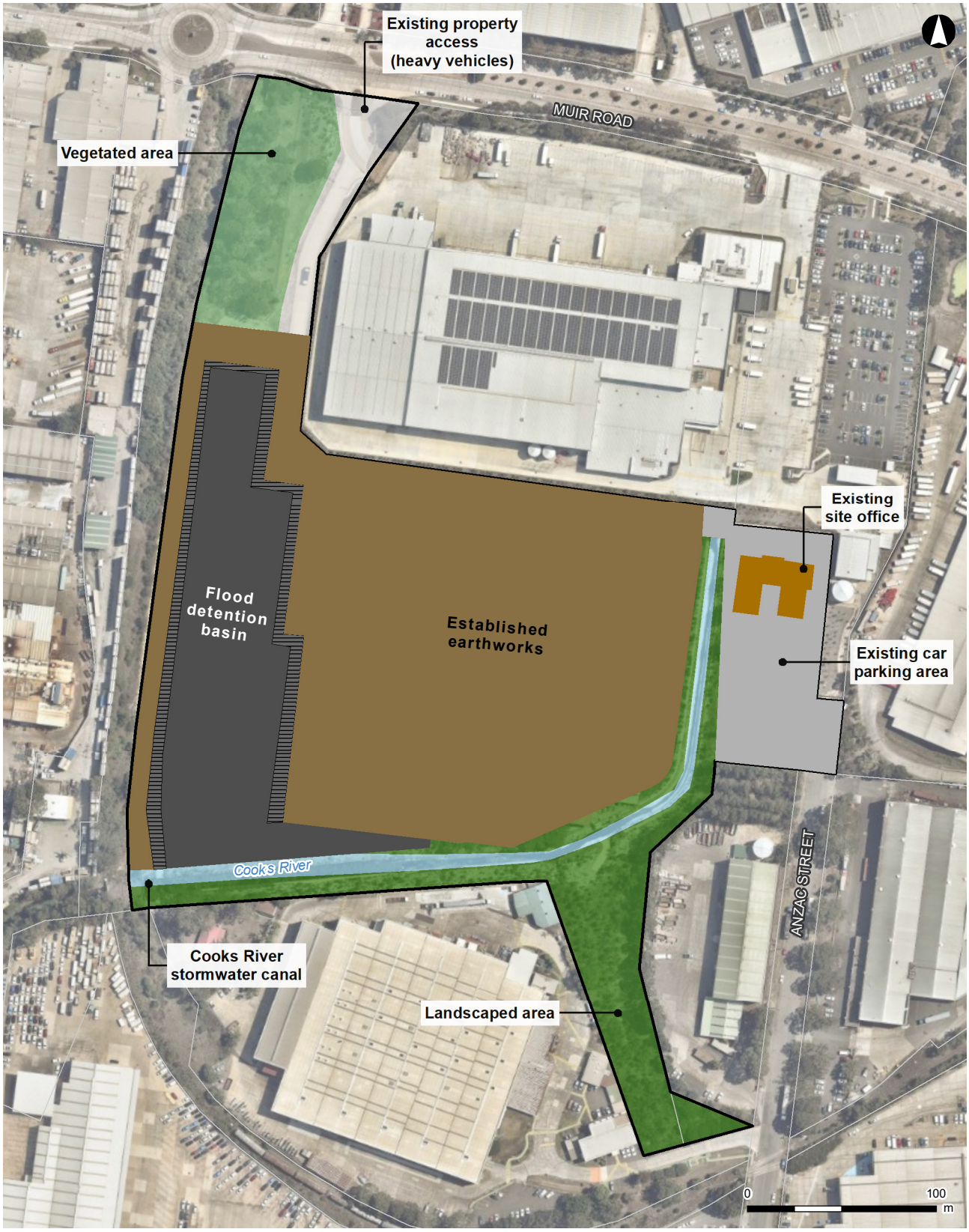
- Site clearance, including:
  - Demolition of temporary structures and general clean-up of the proposed site fill area and flood storage area
  - Removal of tress and other vegetation (within fill area and flood storage area)

  - Crushing of the existing concrete slab, temporary stockpiling of crushed material and reuse of it as a fill material
- Earthworks, including:
  - Cut and fill for the flood storage area
  - Construction of a flood detention basin and installation of stormwater infrastructure
  - Filling the area to the required level using existing crushed recycled concrete material and imported shale / sandstone material.

The commencement of the construction of the Proposal would occur following completion of the flood mitigation works. The flood mitigation works will establish new baseline conditions for the Chullora RRP site. The figure below shows the features of the Chullora RRP upon completion of these works. In general, the Chullora RRP would comprise:

- The Proposal site – comprising a 2.5 ha developable area for the construction and operation of the MRF and internal roads and supporting infrastructure
- The existing site office and car parking area - comprising the 0.7 ha eastern portion of the Chullora RRP site
- A flood detention basin and stormwater infrastructure – comprising the 1.7 ha area in the western portion of the Chullora RRP site
- The future development area – comprising the 1.8 ha central portion of the Chullora RRP site
- The Cooks River stormwater canal
- A 1.2 ha landscaping area comprising the southern portion of the Chullora RRP site
- A 0.44 ha vegetated in the north-western corner of the Chullora RRP site.

Landowners consent has been provided by Frasers Property who own the Chullora RRP site (provided in Appendix D of this EIS).



LEGEND

- Chullora RRP site boundary
- Established earthworks
- Batter
- Flood detention basin
- Property boundary

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Coordinate System: GDA 1994 MGA Zone 56
Date issued: August 3, 2020
Aerial imagery source: nearmap Jan 2020

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Chullora flood mitigation works - 'Existing site features for the Proposal'

The Applicant and Proposal objectives

SUEZ would be responsible for the development, operations and maintenance of the Proposal and the broader Chullora RRP. SUEZ has been operating for more than 160 years and is a global leader in water solutions, resource recovery and waste management. Currently, SUEZ operates over 50 energy recovery plants globally, serving 65 million people as a trusted partner of organisations and Governments across five continents.

In Australia, SUEZ operates critical infrastructure such as the Prospect Water Filtration Plant in Sydney, treating 85 per cent of Sydney's drinking water as well as desalination plants in Melbourne and Perth. SUEZ is also a market leader in resource recovery in New South Wales and manages the most extensive waste infrastructure network in the state, with a focus on recycling and recovery of critical resources. This includes operation of Spring Farm Resource Recovery Park, Lucas Heights Resource Recovery Park and Moruya Resource Recovery Centre.

The key objectives of the Proposal are to deliver an MRF which will:

- Reactivate the Chullora site by establishing a state of the art MRF, increasing the capacity and resilience of the recycling network in Sydney
- Contribute to NSW achieving its resource recovery targets under the NSW Waste and Resource Recovery Strategy 2014-21 (NSW Environmental Protection Authority (EPA), 2014) (WARR Strategy) through recycling and reuse of co-mingled recyclables, paper and cardboard and plastics
- Integrate the Chullora RRP into SUEZ's broader resource recovery network to produce high quality materials that meet the stringent quality criteria of domestic and international markets
- Deliver on the principles of a circular economy through implementation of a pull-through model that conceives of the sorting, reprocessing and specified end uses of processed materials as an integrated, closed loop solution
- Manage potential impacts associated with the construction and operation of the Proposal in an environmentally and socially responsible manner.

Need for the Proposal

The conventional model of recycling that has been historically adopted across Australia is facing considerable disruption and greater vulnerability. This disruption puts recycling outcomes across Australia, including Greater Sydney, at risk. Global market risks, policy drivers and diminishing recycling capacity are all contributing to the need for the Proposal, namely:

- **MRF capacity in the Metropolitan Levy Area (MLA):** MRF processing capacity is constrained and at risk of decline, compromising the ability to meet NSW Government waste policy goals. If waste generation holds steady at 2017-18 rates until 2021-22, 1.07 million tonnes of MRF capacity would be needed in the MLA just to achieve the MSW resource recovery target of 70 per cent. The additional processing capacity offered by the Proposal would support both the NSW Government policy goal to increase recycling and improve the security of kerbside recycling during a period of significant disruption
- **Global market disruption and industry impacts:** International market uncertainty has significantly challenged the conventional recycling model of a basic 'sort and export'. The Proposal is a direct response to these challenges as it adopts a 'pull through' model, which starts by securing local offtake markets in order to define output product specifications and has been designed to meet those requirements
- **Proposed export ban for key materials:** The federal export ban on unrefined materials is promoting investment in materials reprocessing. The Proposal is in strong alignment with the intended ban
- **National Packaging Targets 2025:** The National Packaging Targets trigger the need for a major expansion in the recycling rate of plastic packaging, including additional sorting capacity. The Proposal would support delivery of the National Packaging Targets

- **Alignment with the emerging circular economy:** The Proposal supports the critical shift in approach to waste management in Australia, from producing generic low cost, low grade materials to a pull through model that conceives of the sorting, reprocessing and specified end uses as an integrated, closed loop solution.

The Proposal, forming part of the overall Chullora RRP, represents critical infrastructure that will be required to facilitate the export ban on unrefined recycling streams, facilitate circular economy flows and build the resilience of the local recycling sector. In addition, the Proposal supports the objectives of a range of strategic planning policies, including:

- NSW Waste Avoidance and Resource Recovery Strategy 2014-21 (NSW EPA, 2014a)
- National Waste Policy: Less Waste, More Resources (Australian Government, 2018)
- NSW 2021: A Plan to Make NSW Number One (NSW Government, 2011)
- Greater Sydney Region Plan: A Metropolis of Three Cities (Greater Sydney Commission, 2018a)
- South District Plan (Greater Sydney Commission, 2018b)
- Canterbury-Bankstown Community Strategic Plan 2028 (Council, 2018)
- NSW Circular Economy Policy Statement – Too Good to Waste (NSW EPA, 2019a).

Capital investment value and workforce

The capital investment value for the Proposal, consistent with the definition provided in the EP&A Regulation, is approximately $54 million Australian Dollars (AUD) (excluding goods and services tax (GST)) (refer to the Capital Investment Value (CIV) Report in Appendix C).

The Proposal would generate temporary direct and indirect jobs through the design, planning and construction phases of its delivery. The construction of the Proposal would employ approximately 30 employees for the duration of the construction program.

The operation of the Proposal site would employ approximately 45 full time equivalent (FTE) employees. Employees would generally work in two shifts, with approximately half of all employees operating the MRF in each shift (although noting fewer staff may be used during night-time and weekend periods).

Proposal alternatives

Consideration was given to a number of alternatives as part of the approach and design development for the Proposal. Each of these alternatives have been discarded as they would not adequately address the Proposal's objectives or address the critical need for the Proposal.

The feasible alternatives considered for the Proposal, include:

- **A 'Do nothing' scenario:** this scenario was rejected as it would not increase MRF processing capacity within the Greater Sydney region. This would be inconsistent with the objectives and goals mandated in local, state and national strategic planning frameworks (discussed above). Similarly, a 'do nothing' scenario would mean that waste generated in the local community would be transported at greater distances to facilities outside the Greater Sydney region
- **Alternative site:** Several alternative sites were assessed including refurbishing the existing Spring Farm MRF. This scenario was rejected as the Proposal site currently has approval for resource recovery activities and is situated in close proximity to key regional transport infrastructure. The site also has appropriate industrial zoning and supported by the existing SUEZ infrastructure, including the existing site office already established on the site. The location of the Proposal is better placed geographically to service central Sydney customers and would yield the benefit of previously operating as a waste management facility
- **Alternative site configuration and layout:** Design changes have been made to the Proposal in response to advice and consultation with government authorities, service providers and the community, as well as additional data from more detailed environmental and social investigations. Where a refinement was likely to have wider implications, or where a range of constraints and

alternatives was considered, design refinements were identified in the context of environmental considerations.

Proposal description

The Proposal would comprise the construction and operation of a MRF with a material handling capacity of up to 172,000 tonnes per annum (tpa), comprising:

- Up to 115,000 tpa of co-mingled recyclables collected from municipal and C&I sources
- Up to 50,000 tpa of source separated paper and cardboard for baling
- Up to 7,000 tpa of external mixed plastics for secondary processing.

Once operational, the Proposal would receive waste from locally generated sources as well as the greater Sydney area. The total input in any year would not exceed 172,000 tpa, with the exact throughput from each source varying subject to the market conditions in that year and different Councils' recycling collection regimes.

The Proposal would represent a critical piece of waste management infrastructure which would mitigate significant capacity constraints currently impacting the Sydney region. The Proposal would provide advanced recycling processes to build resilience within the current network of recycling facilities as well as promote the principles of a circular economy through implementation of a pull-through model that conceives of the sorting, reprocessing and specified end uses of processed materials as an integrated, closed loop solution.

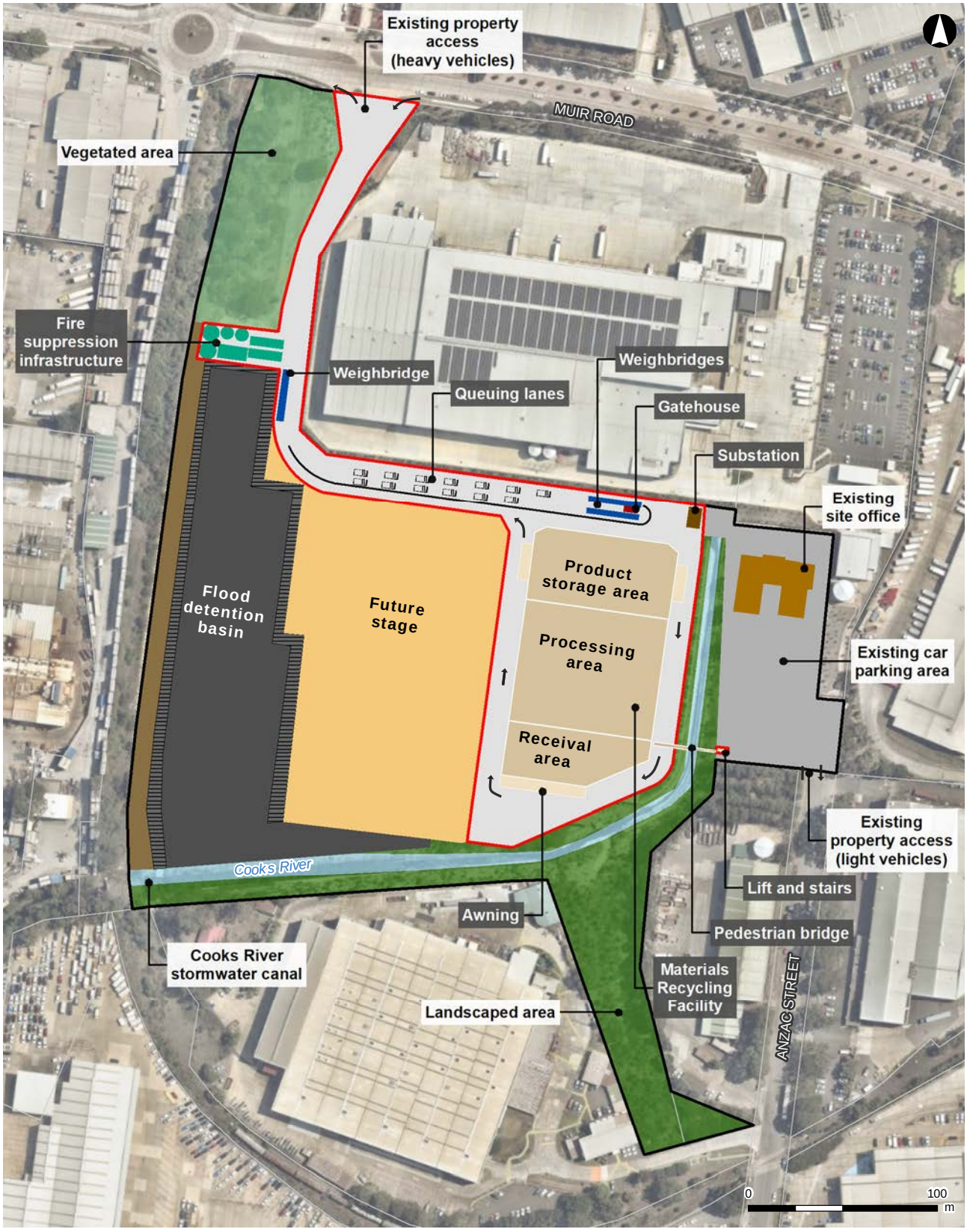
The key construction components of the Proposal would include:

- Establishment of a hardstand area and internal road network
- Construction of an enclosed MRF shed. The MRF would have a height of approximately 12.3 metres (m) and would comprise three separate areas:
  - A 1,950 m^2 waste receival area
  - A 4,995 m^2 processing area
  - A 2,980 m^2 product storage area
- Installation and commissioning of fixed plant and equipment
- Installation of ancillary infrastructure, including weighbridges, pedestrian overbridge, and fire systems
- Installation and connection of site service infrastructure (electrical, water, sewer, gas and telecommunication services)
- Installation of signage.

The key operational components of the Proposal would include:

- Operation of a MRF 24 hours per day, seven days per week (including processing and waste delivery and collection)
- Product storage.

The key components of the Proposal are shown in the figure below.



LEGEND

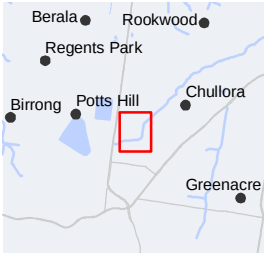
- Chullora RRP site boundary
- Proposal site
- Future stage
- Established earthworks
- Batter
- Flood detention basin
- Property boundary

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ARCADIS



The Proposal

Statutory planning approvals process

The Proposal is considered State Significant Development (SSD) under Clause 23 (waste and resource management facilities) of Schedule 1 of the *State Environmental Planning Policy (State and Regional Development)* 2011, which refers to:

> *(3) Development for the purpose of resource recovery or recycling activities that handle more than 100,000 tonnes per year of waste*

The relevant local planning instrument is the *Bankstown Local Environmental Plan 2015* (BLEP 2015). The Proposal site is zoned IN1 General Industrial, which under Division 23 of *State Environmental Planning Policy (Infrastructure) 2007* (ISEPP) is a prescribed zone in which a waste or resource management facility is permissible with consent.

Consultation

SUEZ have prepared a Community and Stakeholder Participation Strategy (CSPS) to outline their approach to consultation during the delivery of the Proposal. The CSPS is provided in Appendix I of this EIS. The CSPS contains a number of consultation objectives which reflect SUEZ' commitment to listening and engaging with the community and key stakeholders of the Proposal to identify and address any concerns and where practical make amendments to respond to these issues. The consultation approach outlined in the CSPS focuses on two key stakeholder groups: government agencies and the community.

A number of government agencies have been actively consulted with throughout the preparation of the EIS, including:

- Department of Planning, Industry and Environment (DPIE)
- NSW Environment Protection Authority (EPA)
- Fire and Rescue NSW (FRNSW)
- Transport for NSW (including the former Roads and Maritime Services) (TfNSW)
- Canterbury-Bankstown City Council (Council)
- Sydney Water.

These agencies have been consulted via face-to-face meetings, email and telephone correspondence, letter correspondence, site visits and provision of draft report content for review. Aspects raised by government agencies largely focused on the fire design of the Proposal, as well as other aspects such as hazards and risk, contamination and flood storage; each of which have been addressed within this EIS. A number of design refinements have been made to the Proposal in response to stakeholder feedback, largely in relation to the fire systems design for the Proposal.

The Proposal site is within an industrial area of Chullora and surrounded by industrial properties. The closest residential receivers are approximately 455 m to the southwest and 600 m to the east of the site and residences are not visually exposed. Given the location and nature of the Proposal the key community stakeholders were identified as being property and business owners within the surrounding suburb. Consultation activities had originally intended to include door knocking within the surrounding suburb to provide neighbouring and nearby properties with an overview of the Proposal and to seek feedback on the Proposal. Due to COVID-19 and government social-distancing recommendations, it was subsequently considered more appropriate to limit consultation activities to virtual and printed mediums, comprising:

- A community information mail-out
- Follow up direct correspondence (via telephone and email) with neighbouring and nearby property and business owners
- A feedback survey
- A dedicated Proposal website.

Only one response was received via the above consultation activities; which noted no major concerns with the Proposal. As of end of May, the Proposal website was viewed 66 times, with an average time spent on the website of 3 minutes, 42 seconds.

Further consultation will be undertaken by SUEZ during the exhibition of the EIS and the future delivery of the Proposal.

Key Environmental issues

The EIS includes an assessment of the Proposal having regard to the key environmental issues. Summary findings for key environmental issues are presented below.

Traffic, access and parking

An assessment of potential construction and operational traffic impacts generated by the Proposal was undertaken by the Transport Planning Partnership (TTPP) (Chapter 7 and Appendix J of this EIS).

The traffic assessment was undertaken in relation to the road networks surrounding the Proposal. These include:

- Hume Highway (A22)
- Rookwood Road / A6
- Muir Road
- Brunker Road
- Anzac Street.

Traffic generated by the Proposal is not expected to compromise the safety or function of the surrounding road network. Any impact due to construction vehicles during the road network peak periods is expected to be minimal and would have no noticeable impact on the local road network. Operation of the Proposal would cause an additional 0-1 second to intersection average delay due to site-generated traffic. Therefore, the Proposal would have an insignificant impact on surrounding road network performance.

Vehicle access to and from the Proposal site is provided via Muir Road for heavy vehicles and Anzac Street for light vehicles. The internal road layout of the Proposal site is designed to accommodate forward movements by the largest vehicle accessing the Proposal site (e.g. a B-double truck). Upon exit, all vehicles would turn left onto Muir Road. Parking and stacking spaces for trucks would be established and demarcated in the northern part of the Proposal site.

Bus services, including the 925 and the M92 are the main form of public transport servicing the Proposal site. The proposed construction and operational activities would not adversely impact existing public transport services.

The Proposal site generates a need for a maximum of 45 car parking spaces which can easily be accommodated within the existing car park, to the east of the Proposal site.

Measures to further manage operation and safety of traffic within the Proposal site are proposed to be included in the CEMP and dedicate Traffic Control Plans (TCPs) and an Operational Traffic Management Plan (OTMP).

Air quality and odour

Katestone Environmental Pty Ltd (Katestone) have undertaken an assessment of the air quality and odour impacts associated with the Proposal (Chapter 8 and Appendix K of this EIS).

The key emissions to air identified as potentially arising from the Proposal include combustion gases (nitrogen dioxide (NO_2), sulphur dioxide (SO_2), carbon monoxide (CO), volatile organic compounds (VOCs), and particulates ($PM_{2.5}$, PM_{10} and total suspended particles (TSP)), dust and odour. These pollutants are anticipated to be generated during the following activities:

- Wheel generated dust from transport of incoming and outgoing waste along the sealed road to and from the MRF
- Dust due to screening, shredding, crushing and other material transfers within the MRF
- Emissions of exhaust pollutants including NO_2, SO_2, CO and particulates from vehicle movements on-site and mobile equipment within the MRF.

Ambient (background) pollutant concentrations were identified using datasets from the Chullora monitoring station and the Bureau of Meteorology's (BoM's) Sydney Airport station for the period 2015-2019. All relevant pollutants were shown to be below the relevant criteria levels except for 24-hour maximum concentrations for $PM_{2.5}$ and PM_{10} which were shown to exceed the criteria on a number of days each year.

During construction, air quality emissions would be largely limited to diesel exhaust emissions of vehicles bringing material to the site or operating on site. As the construction of the Proposal is limited in nature (i.e. no earthworks) and has a short timeframe, the emissions to air would me minor.

The operational impacts of the Proposal were assessed in regard to $PM_{2.5}$, PM_{10}, NO_2, SO_2, CO, VOCs, dust, and odour. The results demonstrated that the operation of the Proposal would not result in any additional days of exceedance for $PM_{2.5}$ and PM_{10} concentrations. The ground level concentrations of NO_2, SO_2, CO and VOCs were also found to comply with the relevant criteria.

The incoming waste received at the Proposal site during operation is not anticipated to be highly odorous on the basis it would not typically contain putrescible waste. However, it is possible that small amounts of incoming waste may be odorous, depending on the source of the waste, its cleanliness and storage prior to arrival at the MRF. The results from the odour assessment demonstrated that the ground-level odour concentrations resulting from the Proposal are predicted to comply with the odour criteria at all sensitive receptor zones.

Air quality management features such as a misting system, enclosed processing and transfer areas and sealed haul roads have been included within the proposed design to proactively manage the potential for impacts. The impacts to air quality during both the construction and operation of the Proposal are therefore considered negligible, resulting in no specific mitigation measures in addition to the Proposals numerous design air quality mitigation features being considered. All air quality related impacts will be managed through the CEMP and OEMP.

Water quality and hydrology

Costin Roe Consulting have prepared a Water and Hydrology Impact Assessment to assess the water quality and hydrology impacts associated with the Proposal (Chapter 9 and Appendix L of this EIS).

The Water and Hydrology Assessment has identified the potential impact associated with the Proposal as it relates to four key aspects:

- Water quality
- Water quantity (stormwater)
- Flooding
- Water use.

The assessment was undertaken in accordance with the relevant Commonwealth, state and local stormwater engineering and modelling guidelines. These guidelines were used to inform the targets and objectives implemented for each of the above aspects and assess whether the Proposal would meet the relevant requirements.

A number of existing pieces of water and hydrology infrastructure would exist across the Chullora RRP site (being either already in place or proposed as part of the flood mitigation works (DA 366/2020). Further features to manage water and hydrology impacts have been included within the design of the Proposal including design features within the MRF (such as sumps and sewer discharge connections) and across the broader Chullora RRP (including gross pollutant traps, biofiltration systems and stormwater diversion drains). These measures have been considered in the water quality and hydrology impact assessment.

Water and hydrology impacts arising from the construction of the Proposal are considered minimal due to the limited duration and intensity of construction activities. Any potential impacts were concluded to have been adequately mitigated by existing and proposed design and management measures.

A Model for Urban Stormwater Improvement Conceptualisation (MUSIC) has been utilised to determine the effectiveness of the existing and proposed water quality controls in relation to a number of pollutants. The modelling indicated that the stormwater treatment measures incorporated into the design of the Proposal would meet all guideline criteria and would result in only a minor increase in pollutant loads entering the receiving waters. Due to this, the potential water quality impacts of the Proposal are considered minimal. Negligible quantities of leachate and wastewater would be generated within the MRF (in response to clean-up of spills and leaks only) and would be discharged to sewer via a trade waste agreement.

The water quantity (stormwater) assessment found that the Proposal would not result in a significant increase to the peak stormwater flows in the Cooks River canal and would not adversely impact surrounding properties. Therefore, the impacts of stormwater from the Proposal are considered minimal.

The Proposal would be constructed on an established earthworks platform 0.5 m above the 1-in-100 year flood level, providing the site with flood immunity. Notwithstanding, the Proposal site is noted to be within a probable maximum flood (PMF) extent which poses a safety risk to staff on site. Flood immune land exists in the north-western corner of the Chullora RRP which can be reached on foot, and egress is possible via Muir Road and Rookwood Road. A Flood Emergency Response Plan (FERP) will be prepared for the Proposal for the highly unlikely event a PMF event occurs.

A water balance assessment was undertaken to determine the daily water supply and water use demands of the Proposal, incorporating measures to minimise the water demand for the Proposal. This assessment estimated that the Proposal would have potable water demands of 1.8 kL per day. Rainwater harvesting would supply approximately 50 per cent of the non-potable water demand.

Measures to further manage water quality and hydrology impacts beyond the measures designed into the Proposal are proposed to be included in the CEMP and OEMP. A Draft Erosion and Sediment Control Plan (ESCP) and Draft Stormwater Management Plan have been prepared and are provided in Appendix L.

Soils and contamination

A desktop review of previous geotechnical investigations and contamination reporting for the Chullora RRP site has been undertaken to assess key risks associated with soil and groundwater contamination issues identified for the Proposal based on the proposed construction and operation activities (Chapter 10 of this EIS).

The geology of the Proposal site has been identified as Bringelly Shale comprising claystone, sandstone, shale and siltstone. These soils are characterised by moderately reactive highly plastic subsoil, low fertility and poor soil drainage. Due to these characteristics, the erodibility of these soils is considered high. No known occurrences of acid sulphate soils have been identified on the Proposal site to date and the closest area of known occurrence is located approximately three kilometres west. Salinity risk mapping of the site has indicated that it is a moderate to high risk of salinity (Department of Infrastructure, Planning and Natural Resources (DIPNR), 2003).

Previous contamination assessments undertaken in 1996, 2016, 2018 and 2019 have indicated that elevated concentrations of contaminants were present in several isolated locations in soil, groundwater and sediments on the Chullora RRP site. However, none of these contaminants were identified within the Proposal site boundary and a number of the areas identified will have been subsequently excavated or capped as part of the flood mitigation works (DA 366/2020 – subject to approval).

This contamination is likely the result of previous industrial activities. The Chullora RRP site was subject to a remediation action plan (RAP) in 2016 following the identification of contamination within soils. Following the validation of these activities, the Proposal site was certified within a Site Audit

Report (Enviroview, 2016) and Site Audit Statement (NSW EPA, 2016a) as being suitable for a commercial / industrial land use.

During operations, the Proposal site would be capped with permanent hardstand and would be constructed on land raised with imported fill. Due to this, the risk of exposure to existing contaminants is considered low. Accidental spills and leaks may occur during the operation of the Proposal and may have the potential to be transported into the Cooks River and groundwater system if left unmanaged. The highest spill risk would be associated with the operation of the proposed 60 KL diesel storage tank. To minimise the risk of release from the diesel storage tank, the proposed tank would be a self-bunded (double wall) tank compliant with *AS - 1940-2004: The storage and handling of flammable and combustible liquids*.

Construction and operation works would be undertaken under a CEMP and OEMP respectively to manage risks from erosion and sedimentation, prevent contamination, and manage any unexpected finds during works. In addition, a Pollution Incident Response Management Plan (PIRMP) will be implemented during operations to outline procedures to manage spills and leaks and notification procedures in the event of a spill. This would be supported by maintaining a spill kit on site at all times and implementing a refuelling procedure to avoid potential fuel, lubricant or hydraulic fluid spillages.

Noise and vibration

Wilkinson Murray have undertaken a noise and vibration impact assessment (NVIA) to assess the noise and vibration associated with the Proposal (Chapter 11 and Appendix N of this EIS).

The noise and vibration impacts from the construction and operation of the Proposal were assessed in relation to 18 noise catchment areas (NCAs) and six industrial receivers. A range of noise management levels (NML) and vibration criteria were developed in accordance with the following NSW guidelines and policies:

- *Interim Construction Noise Guideline* (ICNG) (Department of Environment and Climate Change (DECC), 2009)
- *Assessing Vibration: A Technical Guideline* (Department of Environment and Conservation (DEC), 2006b)
- *Noise Policy for Industry (NPfI)* (NSW EPA, 2017)
- *Road Noise Policy* (Department of Environment, Climate Change and Water (DECCW), 2011)
- *Construction Noise Strategy* (Transport Construction Authority (TCA), 2012).

Noise impacts associated with the construction of the Proposal were assessed for the three phases of construction. The predicted noise levels are not anticipated to exceed the established NML with the exception of one minor temporary exceedance (by one decibel A-weighted (dBA)) identified at one NCA during one stage of construction. Given the temporary and minor nature of this exceedance the construction impacts are generally considered acceptable. No vibration impacts were identified during construction.

Noise impacts associated with the operation of the Proposal were assessed in relation to a worst-case operational noise scenario involving 24/7 operation of the MRF with all roller doors open, along with peak truck movements. The noise levels at sensitive receivers during this scenario were all predicted to comply with the established NMLs. The road noise impacts associated with the operation of the Proposal demonstrated that the increase in noise from the existing conditions is negligible and complies with the RNP.

Despite no significant noise related impacts being identified, a range of management and mitigation measures will be incorporated into the CEMP and OEMP to minimise the unnecessary generation of noise during construction and operation.

Hazards and risks

A hazard and risk screening analysis has been undertaken to identify potential hazards and risks during construction and operation of the Proposal (Chapter 12 of this EIS). The risk screening determined that, while chemicals and potentially dangerous goods would be stored within the Proposal site, quantities would not be substantial enough to trigger the requirement for a preliminary hazard analysis (PHA).

As the Proposal would be constructed on a prepared earthworks foundation, raised above the 1-in-100 flood event level, and would involve minimal disturbance to soils and no interaction with groundwater, there are minimal existing hazards to consider.

Potential hazards to the environment and / or public health through construction and operation of the Proposal include spills, fire and explosion, health and respiratory impacts, vehicle movements, and receipt of non-conforming waste that may contain contaminated or asbestos-containing material.

An operational risk assessment was undertaken to identify the measures that will be implemented to minimise hazards and risks during construction and operation, including engineering and administrative controls. The key mitigation measures that will be implemented include the preparation of a CEMP incorporating the standards of the *Work Health and Safety Act 2011 (WHS* Act), and the preparation of an OEMP including a PIRMP which will outline emergency response and incident management strategies, safety equipment to be maintained and provided, and operational protocols.

Other issues

Socio-economic

An assessment of the social impacts associated with the Proposal has been undertaken by Element Environmental (Chapter 13 and Appendix O of this EIS). The assessment included a formal Social Impact Assessment (SIA) that was prepared in accordance with the comprehensive requirements of the Social Impact Assessment Guideline (DPIE, 2017).

The SIA Guideline identifies nine potential forms of social impact. Two of these categories were found to be applicable to the Proposal. Within these two categories, six ‘social impact matters’ were identified as being potentially impacted by the Proposal. The Proposal was assessed against each of these matters using a range of assessment methods selected during the scoping process.

The social baseline analysis found that the population of Chullora is no more or less susceptible to types of social impacts that may be generated by the Proposal and that the Proposal is well-suited to the existing Chullora area in terms of its scale and industrial nature and long history as a waste management facility.

Due to the limited duration and intensity of construction, only two of the six social impact matters were assessed for the construction of the Proposal. Both potential impacts; road traffic delays and acoustic amenity disturbance; were assessed to be immaterial.

All six social impact matters were assessed for operation with two considered positive and four considered negative impacts. The potential positive impacts, including built environment improvement (visual amenity) and community services improvement (advanced recycling capability for the community) were assessed to be of a high and moderate (positive) impact. All potential negative impacts, including road traffic delays, acoustic amenity disturbance, air quality and odour disturbance and community safety (MRF fire risk) were assessed to be immaterial.

Measures for reducing other environmental aspects (e.g. traffic disturbance, fire risks noise and air quality impacts) and other social impacts will be incorporated into the CEMP and OEMP which will also reduce any associated social impacts.

Biodiversity

A Biodiversity Development Assessment Report (BDAR) has been prepared by Arcadis (Chapter 14 and Appendix P of this EIS).

The Proposal site has been extensively disturbed by human activity, including vegetation removal, removal or burial of soil and has been subject to the construction of buildings, railway lines, roads and land modification for water management and levelling. Following completion of the flood mitigation works (subject to DA 366/2020) there would be no existing vegetation with the Proposal site and a lack of ecological features. The Proposal site does not contain any existing wetlands and the Cooks River stormwater canal, which runs adjacent to the south-eastern boundary, has minimal biodiversity value due to its highly disturbed context. Currently, the Proposal site includes an established levelled earthworks pad and an existing formalised driveway for heavy vehicles.

No biodiversity values were identified within the Proposal site. One patch of the Threatened Ecological Community (TEC) *Cooks River / Castlereagh Ironbark Forest in the Sydney Basin Bioregion* was identified adjacent to the Proposal site in the north-western extent of the Chullora RRP. The design of the Proposal has avoided direct impact to this TEC and therefore there would be no direct impact from development or operation of the Proposal. Indirect impacts to this TEC would be negligible, if any occur, and will be managed through the implementation of mitigation actions mentioned below.

During the construction and operational phases of the Proposal, there is a possibility of low level indirect impacts to biodiversity. These include:

- Inadvertent impacts on adjacent habitat or vegetation
- Reduced viability of adjacent habitat due to edge effects
- Reduced viability of adjacent habitat due to noise, dust or light spill
- Transport of weeds and pathogens from the Proposal site to adjacent vegetation.

With the appropriate mitigation measures implemented, the likelihood of these impacts is significantly reduced. As there are no TEC listed under the EPBC Act within the Proposal boundary, no offsets are required for this Proposal.

Aboriginal heritage

An Aboriginal heritage due diligence assessment was undertaken by Artefact (Chapter 15 and Appendix Q) to satisfy the requirements of the *National Parks and Wildlife Act 1974.* A comprehensive review was included in the assessment for the Chullora RRP concerning historical and environmental contexts of the site, ethnohistorical background of the locality, and likelihood examinations for the presence of heritage items.

The Proposal site has been extensively disturbed by human activity, including disturbance, removal, or historical filling, land reclamation activities, stormwater channel upgrade works, intrusive site investigations and remediation works. Vegetation within the site has been completely cleared and previous wetlands have been filled. The Proposal site is located within 200 m of Cooks River stormwater channel, however, there has been much disturbance to the site through the construction of industrial buildings, railway lines, roads, and land modification for water management and levelling.

An aboriginal heritage site due diligence investigation conducted prior to the commencement of the flood mitigation works (subject to DA 366/2020) did not identify Aboriginal artefacts or areas of archaeological sensitivity. The flood mitigation works will substantially alter the landform compared to that inspected during the site investigation, through excavation, filling and capping. It was determined that given the existing low likelihood of Aboriginal items being present, which would be exacerbated by the subsequent flood mitigation works, the Proposal is considered to have a negligible likelihood of impacting any Aboriginal heritage items.

Further, an Aboriginal Heritage Information Management System (AHIMS) extensive search was conducted to investigate any previous records of Aboriginal sites within 200 m of the Proposal site. No sites have been recorded.

Under the unlikely scenario unexpected artefacts identified as having Aboriginal heritage significance are exposed either during construction or operation, work would be required to temporarily cease and

the EES Group would be informed, to determine the appropriate management strategy. This measure would also be included within the existing CEMP and OEMP for both construction and operation of the Proposal.

Non-Aboriginal heritage

A non-Aboriginal heritage impact assessment has been undertaken for the Proposal to identify impact non-Aboriginal heritage items or values during construction and operation (Chapter 16 of this EIS).

The Proposal site does not contain any registered items of non-Aboriginal heritage significance. Seven items of non-Aboriginal local and state heritage significance are located within one km of the Proposal site (with a further seven within 1.5 km of the Proposal site), including one archaeological site and one heritage conservation area. No non-Aboriginal heritage items or conservation areas of national significance are located within close proximity of the Proposal site.

The identified non-Aboriginal heritage sites identified within the vicinity of the Proposal are listed below:

- “Carinya” House - located at 50 Rookwood Road, Yagoona
- Chullora Railway Workshops – located at Beaufort Place, Chullora, NSW 2190 (adjacent to Hume Hwy)
- Former Lidcombe Hospital Site (heritage conservation area) – located at Joseph Street, Lidcombe
- Minali Special School (early twentieth century residence) – located at 169 Joseph Street, Lidcombe, NSW
- Potts Hill Reservoirs 1 and 2 and site - located at 146 Rookwood Road, Chullora
- Pressure Tunnel, Shaft No 1 and associated infrastructure - located at 189 Rookwood Road, Chullora
- Site of Royal Arms Inn (archaeological site) – located at 2-2A Hume Highway, Chullora, NSW 2190.

The impact to the identified non-Aboriginal heritage items in the vicinity of the Proposal would be limited to potential amenity and visual impacts during both construction and operation. These impacts are considered to be negligible.

Should the Proposal interact with undiscovered heritage items of significance it is recommended that construction works or operations cease and the item be assessed by a suitably qualified person. The DPIE would be subsequently notified to determine the appropriate management strategy for the heritage item.

Greenhouse gas emissions

Katestone have prepared a Greenhouse Gas (GHG) Impact assessment to assess the GHG impacts associated with the Proposal (Chapter 17 and Appendix R of this EIS).

GHG emissions that would be generated by the Proposal have been assessed as either Scope 1 (direct) or Scope 2 (indirect) emissions and quantified in relation to carbon dioxide (CO_2) and other non-CO_2 GHG emissions (reported together as carbon dioxide equivalents (CO_2-e)).

Emissions associated with construction of the MRF are primarily associated with the use of diesel fuel within construction plant and equipment. Due to the limited duration and intensity of construction, these emissions are considered negligible.

The operation of the Proposal would generate emissions from diesel and electricity use. The operation of the Proposal would generate approximately 4,644 tCO_2-e, with 93.7 per cent of these emissions attributed to the electricity requirements of the MRF. In total, the Proposal would contribute approximately 0.0008 per cent to Australia’s GHG emissions inventory total and 0.032 per cent to NSW’s GHG emissions inventory total annual emissions. This does not represent a significant impact on a state or national scale.

While the estimated emissions associated with the Proposal are not considered significant, mitigation measures will be employed where possible to minimise the emission of GHG where feasible.

Visual amenity

A desktop assessment was undertaken by Arcadis to identify the quantity and potential visual amenity impact of the Proposal during construction and operation (Chapter 18 of this EIS). The Proposal site is set within an established industrial landscape which is bounded by the residential communities of Yagoona to the south-west and Greenacre to the south and east. Rookwood Road and the Hume Highway separate the residential communities from the industrial precinct. Potts Park, west of the Proposal site, is the only recreational area in the vicinity of the Proposal site.

Eight potential viewpoints were identified and photographs from each of these locations were taken during a site inspection undertaken on 14 January 2020. The visual impact of the Proposal at the eight identified viewpoints was assessed against three criteria: visual sensitivity, magnitude and visual impact.

During construction, there is potential for some construction equipment to be visible from five viewpoints, none of which are from residential areas. Due to the temporary nature of the construction works and the surrounding industrial land uses, it is unlikely that visual impacts would be overly intrusive.

During operation of the Proposal, there is potential for the site elements to be visible from two viewpoints (comprising road users) which are located along Muir Road. However, due to the industrial character of the area any introduction of industrial elements to the Proposal site would not result in a material change to the visual amenity in this area. The material and finishes used on the structures of the Proposal would ensure that the Proposal would blend into the surrounding landscape. The Proposal was assessed as having a 'negligible impact' at all viewpoints.

Mitigation measures will be implemented during construction and operation of the Proposal to minimise any potential visual amenity related impacts.

Waste management

A desktop assessment was undertaken by Arcadis to identify the quantity and potential impact of the waste generated by the Proposal during construction and operation (Chapter 19 of this EIS). The waste impacts of the construction and operation of the Proposal are deemed to be minor and any impacts would be readily managed and reduced through the implementation of mitigation measures.

The construction phase of the Proposal would involve the construction of infrastructure, which would predominantly generate waste in the form of surplus building and packaging materials, and from construction personnel' amenities and lunchrooms.

During operation, waste would be generated through offices, amenities, lunchrooms, and maintenance of plant and equipment which would generate waste in the form of cardboard, plastics, fuels / oils and tool and equipment consumables.

Measures to mitigate the effect of the construction waste streams will be incorporated into the Proposal's CEMP and OEMP and would include best practice waste avoidance and waste management where practicable.

Cumulative impacts

The Proposal has been assessed in the context of existing, proposed and future developments in the surrounding area that may result in cumulative environmental impacts.

A desktop review of available government planning databases revealed six developments in the surrounding area that have the potential to interact with the construction and operation of the Proposal. These developments comprised:

- Redevelopment of Bankstown North Public School (SSD 10290)

- Mixed commercial and residential complex development, 190 Stacey Street, Bankstown (DA-741/2014)
- Eden Greenacre Complex development (DA-3/2015)
- Mixed use complex development, 32 Kitchener Parade, Bankstown (DA-957/2017/B)
- Residential apartments development, 8 Jacobs Street, Bankstown (DA-204/2017/A)
- Warehouse development, 39 Rosedale Avenue, Greenacre (DA-123/2019).

The cumulative impacts of the Proposal and the surrounding developments have been considered in relation to each of the key environmental issues identified in Chapters 7 to Chapter 19 of this EIS.

The nature of the other development proposed in the area are considered unlikely to generate similar impacts to the Proposal, particularly during operation, minimising the potential for cumulative impacts to arise. Across the issues assessed for cumulative impacts no significant additional impacts or exceedances of criteria were identified. As such, the mitigation measures identified for the Proposal would also effectively mitigate the cumulative impacts identified within this section.

Ecologically Sustainable Development

An assessment of the Proposals' consistency with the principles of Ecologically Sustainable Development (ESD) has been undertaken and has demonstrated that the four principles of ESD: the precautionary principle; inter-generational equity; conservation of biological diversity and ecological integrity; and improved valuation, pricing and incentive mechanism, have been appropriately considered and incorporated into the design, construction and operation of the Proposal (Chapter 23 of this EIS). The Proposal meets these principles by:

- **The Precautionary Principle** - The Proposal design and all associated technical studies have been developed in accordance with a precautionary approach to minimise uncertainty and to avoid, minimise, or mitigate potential environmental and social impacts. The EIS identifies mitigation measures and environmental management procedures that would be implemented to minimise and monitor impacts which may occur as a result of uncertainties in the impact assessment. Where a level of uncertainty was identified in the data used for the assessments, a conservative worst-case scenario analysis was undertaken. Subject to the implementation of mitigation measures, these specialist studies did not identify any issues that may cause serious and irreversible environmental damage as a result of the Proposal (refer to Sections 7 to Section 20 and Section 22 of this EIS).
- **Inter-generational equity** – The Proposal has been designed to benefit both existing and future generations through the provision of a state-of-the-art waste recovery facility, which will mitigate significant capacity constraints currently impacting the Sydney region and provide advanced recycling processes to build resilience within the current network of recycling facilities. Further, the Proposal would support the diversion of waste from landfill as well as support the NSW Government's policy statement on the Circular Economy.
- **Conservation of biological diversity and ecological integrity** – The design and assessment of the Proposal has been undertaken with the aim of identifying, avoiding, minimising and mitigating impacts on biodiversity. An assessment of the potential impacts to biodiversity and associated proposed mitigation measures has been undertaken (refer to Chapter 13). The Proposal would not have a direct impact on any biodiversity values.
- **Improved valuation, pricing and incentive mechanisms** – While it is often difficult to place a reliable monetary value on the residual, environmental and social effects of the Proposal, the value placed on avoiding and minimising the environmental impacts of the Proposal is demonstrated in the design features incorporated into the Proposal, and the extent of environmental investigations that have been undertaken to inform this EIS. The approach taken for the Proposal has been to manage environmental impacts by identifying appropriate safeguards to mitigate adverse environmental effects and take up environmental enhancement opportunities. The cost of implementing these safeguards has been included in the total Proposal cost, thereby appropriately reflecting the value of environmental resources. A key shift that would be achieved from this Proposal is the transformation of waste into products aligned to meet the requirements of a range

of end markets. Further, the Proposal addresses the Council of Australian Governments (COAG) reform package for processing waste in Australia as opposed to processing waste offshore.

Justification and conclusion

The potential environmental, social and economic impacts, both direct and cumulative, have been identified and thoroughly assessed as part of this EIS. It has been determined through rigorous investigations that the Proposal would result in minimal impacts during construction and operational phases.

The key environmental issues, as identified in the SEARs, which were assessed for the Proposal include: traffic, access and parking; air quality and odour; water quality and hydrology; soils and contamination; noise and vibration; and hazards and risks.

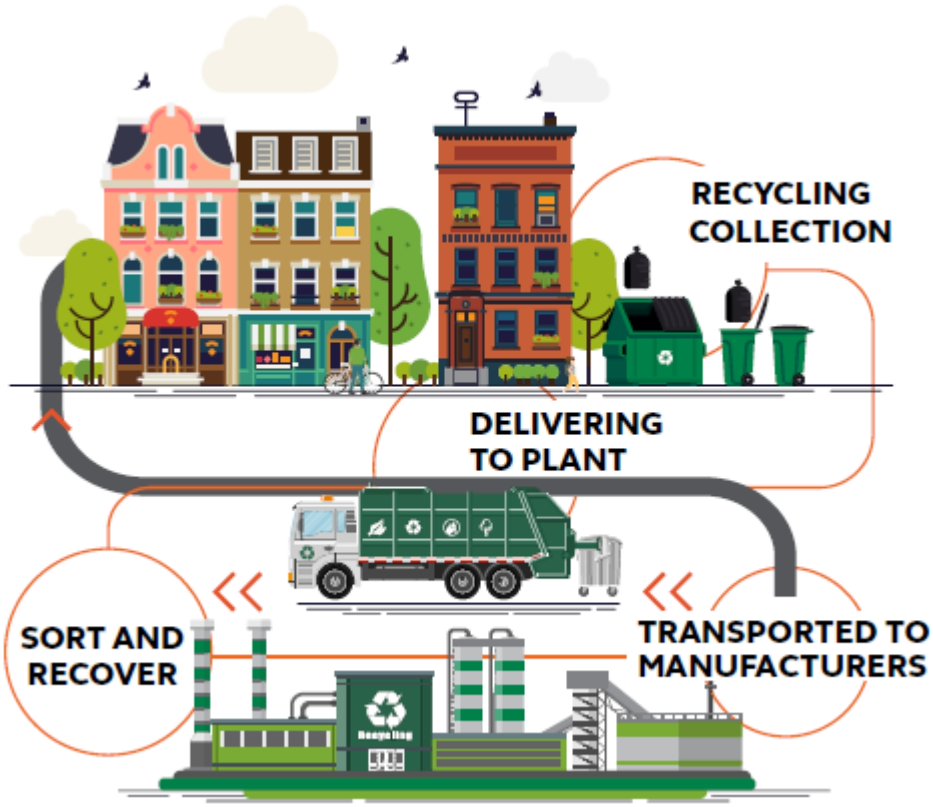
Following examination of the key environmental issues of the Proposal it is considered that any potential impacts associated with the Proposal can be satisfactorily mitigated through a range of measures that have been identified within the EIS. In addition, the Proposal has been assessed against – and has been found to be consistent with – the priorities and targets adopted in relevant and draft State plans as well as Government policies and strategies.

The Proposal has been found to be consistent with its objectives and a strong need for the Proposal is evident in the Sydney Market. The Chullora RRP site is considered suitable for the development of the Proposal. The Proposal has also been compared against possible alternatives to further demonstrate the need, suitability and benefits of the Proposal to the local and wider community.

The Proposal would deliver significant benefits in terms of providing a sustainable resource recovery facility for residents of Sydney's west, and by creating choice and competition within Sydney for resource recovery. Overall, the EIS concludes that the development proposed is in the public interest and approval is recommended.

PART A

INTRODUCTION, BACKGROUND AND PROPOSAL DESCRIPTION



1 INTRODUCTION

Summary

SUEZ Recycling & Recovery Pty Ltd (SUEZ – the Applicant) are seeking to establish the state-of-the art Chullora Resource Recovery Park (Chullora RRP) located at 21 Muir Road (Lot 2 DP 1227526), Chullora in Sydney. SUEZ are proposing to design, build and operate the first phase of the Chullora RRP as a Materials Recovery Facility (MRF) to process co-mingled recyclable municipal solid waste (MSW) and dry commercial and industrial (C&I) waste; with a material processing capacity of up to 172,000 tonnes per annum (tpa) (the Proposal).

This Environmental Impact Statement (EIS) is seeking approval under Part 4, Division 4.7 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the construction and operation of the Proposal.

The Proposal site was formerly operated as the Chullora Resource Recovery Centre (RRC) by SUEZ from 2011 to 2017 when the facility was subject to a fire and subsequently demolished. The Chullora RRC included a Transfer Station, MRF, Garden Organics platform and glass processing shed. The site has since been subdivided with the northern portion developed as the PFD storage warehouse and the southern portion (the subject of this Proposal) used for storage of waste bins, heavy vehicle parking and associated maintenance activities. SUEZ recently submitted development application (DA) (DA 366/2020) with Canterbury-Bankstown City Council (Council) for the development of flood mitigation works across the Chullora RRP site which would be completed prior to the construction of the Proposal.

The objectives of the Proposal are to:

- Reactivate the Chullora site by establishing a state of the art MRF, increasing the capacity and resilience of the recycling network in Sydney
- Contribute to NSW achieving its resource recovery targets under the NSW Waste and Resource Recovery Strategy 2014-21 (NSW Environmental Protection Authority (EPA), 2014a) (WARR Strategy) through recycling and reuse of co-mingled recyclables, paper and cardboard and plastics
- Integrate the Chullora RRP into SUEZ's broader resource recovery network to produce high quality materials that meet the stringent quality criteria of domestic and international markets
- Deliver on the principles of a circular economy through implementation of a pull-through model that conceives of the sorting, reprocessing and specified end uses of processed materials as an integrated, closed loop solution
- Manage potential impacts associated with the construction and operation of the Proposal in an environmentally and socially responsible manner.

1.1 Proposal overview

SUEZ Recycling & Recovery Pty Ltd (SUEZ - the Applicant) are seeking to establish a state-of-the art Resource Recovery Park (RRP) located at 21 Muir Road (Lot 2 DP 1227526), Chullora in Sydney (the Chullora RRP). SUEZ are proposing to design, build and operate the first phase of the Chullora RRP as a Materials Recycling Facility (MRF) to process co-mingled recyclable municipal solid waste (MSW) and dry commercial and industrial (C&I) waste; with a material processing capacity of up to 172,000 tonnes per annum (tpa) (the Proposal).

The Proposal is considered State Significant Development (SSD) under Clause 23 (waste and resource management facilities) of Schedule 1 of the *State Environmental Planning Policy (State and Regional Development) 2011,* which refers to:

> *(3) Development for the purpose of resource recovery or recycling activities that handle more than 100,000 tonnes per year of waste*

This Environmental Impact Statement (EIS) is seeking approval, under Part 4, Division 4.7 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the construction and operation of

the Proposal. This EIS has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) issued by the Department of Planning, Industry and Environment (DPIE) on 20th May 2020.

A detailed description of the Proposal is provided in Chapter 4 of this EIS. The key construction components of the Proposal would include:

- Establishment of a hardstand area and internal road network
- Construction of the enclosed MRF shed
- Installation and commissioning of fixed plant and equipment
- Installation of ancillary infrastructure, including weighbridges, pedestrian overbridge, and fire systems
- Installation and connection of site service infrastructure (electrical, water, sewer, gas and telecommunication services)
- Installation of signage.

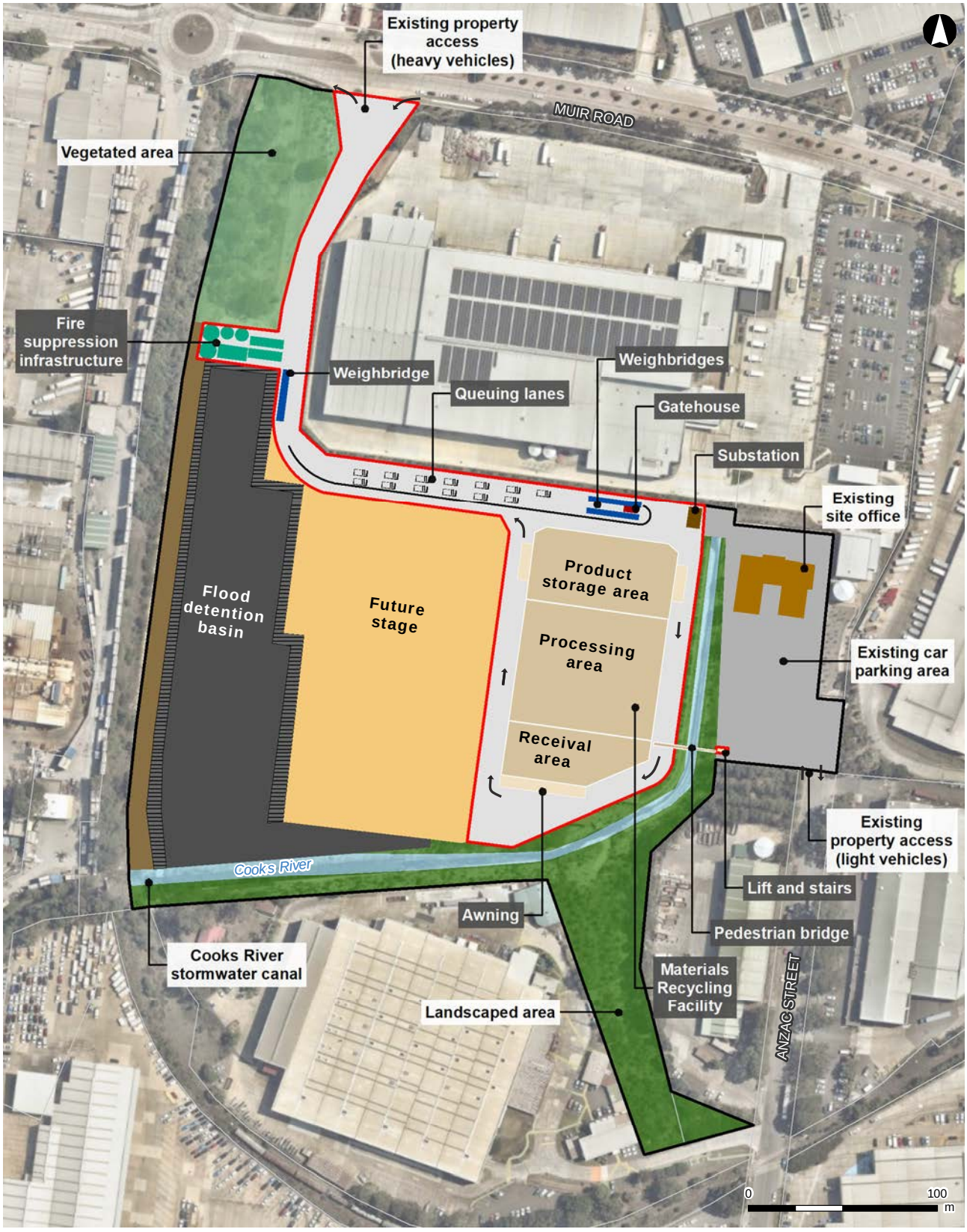
The key operational components of the Proposal would include:

- Operation of a MRF (including processing and waste delivery and collection) 24 hours per day, 7 days per week
- Product storage.

Waste streams that would be processed at the MRF would all comprise dry recyclables from municipal and C&I sources, including:

- Co-mingled material collected from municipal and C&I sources
- Source separated paper and cardboard for bailing
- External mixed plastics for secondary processing.

The key components of the Proposal are shown in Figure 1-1.



LEGEND

- Chullora RRP site boundary
- Proposal site
- Future stage
- Established earthworks
- Batter
- Flood detention basin
- Property boundary

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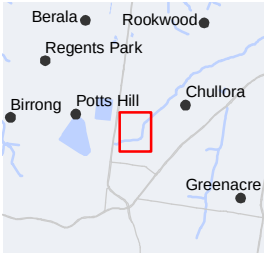


Figure 1-1: The Proposal

1.2 Proposal site and background

The Chullora RRP site is located at 21 Muir Road, Chullora (Lot 2 DP 1227526) within the Chullora Technology Park. The Chullora RRP site is located within the Canterbury-Bankstown Local Government Area (LGA), approximately 18 kilometres (km) west of Sydney Central Business District (CBD) and 10 km east of the Parramatta CBD. A detailed description of the Proposal site is provided in Chapter 2 of this EIS.

The Chullora RRP site was formerly owned by the State Rail Authority of New South Wales (NSW) and the Railways Commissioner of NSW from the 1920s to 1996. During this time, the site functioned as a railway depot for the maintenance of electrical train carriages. The site was redeveloped as a waste facility in 1997, with SUEZ taking on operation from 2011 to 2017 when the site was subject to a fire and subsequently demolished and subdivided. A detailed history of the site is provided in Section 2.3 of this EIS.

On the 12th May 2020 SUEZ lodged a development application (DA) (DA 366/2020) with Canterbury-Bankstown City Council (Council) for the development of flood mitigation works across the Chullora RRP site (the flood mitigation works). The flood mitigation works DA is seeking approval for early works and site establishment across the Chullora RRP site to provide flood immunity and stormwater infrastructure. The commencement of the construction of the Proposal would occur following completion of the flood mitigation works.

The Chullora RRP would be developed on a 9.2 hectare (ha) single parcel of land; being 21 Muir Road, Chullora (Lot 2 DP 1227526) (the Chullora RRP site). The Chullora RRP site comprises the following elements (shown on Figure 1-1):

- The Proposal site - covering the MRF footprint and internal road infrastructure
- The existing site office and car parking area
- A flood detention basin and associated stormwater infrastructure
- The Cooks River stormwater canal
- A landscaping area comprising the southern portion of the Chullora RRP site
- A vegetated area in the north-western corner of the Chullora RRP site.

A detailed description of the Chullora RRP site is provided in Section 2.6.

1.3 Proposal objectives

The objectives of the Proposal are to:

- Reactivate the Chullora site by establishing a state of the art MRF, increasing the capacity and resilience of the recycling network in Sydney
- Contribute to NSW achieving its resource recovery targets under the NSW Waste and Resource Recovery Strategy 2014-21 (NSW Environmental Protection Authority (EPA), 2014) (WARR Strategy) through recycling and reuse of co-mingled recyclables, paper and cardboard and plastics
- Integrate the Chullora RRP into SUEZ's broader resource recovery network to produce high quality materials that meet the stringent quality criteria of domestic and international markets
- Deliver on the principles of a circular economy through implementation of a pull-through model that conceives of the sorting, reprocessing and specified end uses of processed materials as an integrated, closed loop solution
- Manage potential impacts associated with the construction and operation of the Proposal in an environmentally and socially responsible manner.

1.4 Structure of this EIS

The structure of this EIS is as follows:

- **EIS summary:** Provides a brief overview of the Proposal, key environmental assessment results and an outline of the proposed environmental and social mitigation measures
- **PART A: Introduction, background and Proposal description:**
  - **Chapter 1 – Introduction:** Provides an introduction of the Proposal and the EIS, including an overview of the Proposal, a brief description of the Proposal site and the Proposal objectives
  - **Chapter 2 – Site description:** Provides a summary of the Chullora RRP and Proposal site, their location in a regional and local context and existing operations of the Proposal site
  - **Chapter 3 – Proposal justification, need and alternatives:** Provides a discussion on the need for the Proposal having regard to strategic justification, relevant legislation, plans and polices. It also provides alternatives to the design and location of the Proposal
  - **Chapter 4 – Proposal description:** Includes a description of the Proposal including built form, construction methodology and operational procedures
  - **Chapter 5 – Statutory planning and approvals:** Provides a summary and assessment of the Proposal having regard to relevant statutory legislation and plans at a Commonwealth, State and Local Government level
  - **Chapter 6 – Consultation:** Provides a summary of the consultation (public, stakeholder and government agencies) which has been undertaken to date for the Proposal
- **Part B: Assessment of key issues:**
  - **Chapter 7 to 12 – Key environmental issues:** Provides a discussion on the existing environment conditions and an assessment of the key environmental issues for the Proposal, namely traffic and transport, air quality and odour, water and hydrology, soils and contamination, noise and vibration, and hazard and risk
- **Part C: Assessment of other issues:**
  - **Chapter 13 to 20– Other issues:** Provides a discussion of the existing environment conditions and an assessment of the other environmental issues for the Proposal namely social, biodiversity, Aboriginal heritage, non-Aboriginal heritage, greenhouse gas emissions, landscape and visual amenity, waste management and cumulative impacts
- **Part D: Risk assessment, mitigation measures and conclusion**
  - **Chapter 21 - Environmental risk analysis:** Provides an analysis of the likely environmental risks associated with the Proposal and assigns a rating before and after the implementation of mitigation measures
  - **Chapter 22 – Compilation of mitigation measures:** Includes a summary of the mitigation measures identified in Chapter 7 to 20 to minimise any adverse impact of the Proposal on the surrounding environment
  - **Chapter 23 – Ecological Sustainable Development:** Includes a summary of how the Proposal aligns with the principles of Ecological Sustainable Development (ESD)
  - **Chapter 24 – Justification and conclusion:** Provides a justification and conclusion of the Proposal.

The following Appendices are included in the EIS

Appendix	
A	SEARs checklist
B	EP&A Regulation Checklist
C	Capital Investment Value Report
D	Landowners Consent
E	Concept Plans and Architectural Designs
F	Preliminary Building Code of Australia Assessment Report
G	Fire Safety Strategy
H	Fire Systems Design
I	Community and Stakeholder Participation Strategy
J	Traffic Impact Assessment
K	Air Quality Impact Assessment
L	Water and Hydrology Assessment
M	Historic photographs
N	Noise and Vibration Impact Assessment
O	Social Impact assessment
P	Biodiversity Development Assessment Report
Q	Aboriginal Due Diligence Assessment
R	Greenhouse Gas Assessment

Conclusion

SUEZ are seeking to establish the first stage of the Chullora RRP as a MRF to process 172,000 tpa of co-mingled recyclable material. The Chullora RRP site has a long history of use as a waste management facility, having operated as the Chullora RRC from 2011 to 2017.

The objectives of the Proposal focus on reactivating the Chullora RRP site following a fire in 2017, as well as providing a critical piece of infrastructure needed to contribute to NSW's resource recovery targets and circular economy outcomes.

This EIS is seeking approval under Part 4, Division 4.7 of the EP&A Act for the construction and operation of the Proposal. It addresses the amended SEARs issued by DPIE on 20th May 2020.

2 SITE DESCRIPTION

Summary

The Chullora RRP, including the Proposal site, would be developed on a 9.2 hectare (ha) single parcel of land; being 21 Muir Road, Chullora (Lot 2 DP 1227526) (the Chullora RRP site). The Chullora RRP would be developed in stages, with the MRF representing the first stage.

The Proposal site was previously operated as the Chullora Resource Recovery Centre (previous Chullora RRC), which was owned by SUEZ from 2011 until 2016 when the property was acquired by Frasers Property and leased back to SUEZ (landowners consent is provided in Appendix D of this EIS). The facility included a transfer station, a MRF, garden organics platform and a glass processing building. The previous MRF building was the subject of a fire in 2017 and subsequently demolished. On 12th May 2020 SUEZ lodged DA 366/2020 with Council for the development of flood mitigation works across the Chullora RRP site.

The Proposal site is located in the Canterbury-Bankstown LGA and is located approximately 18 km west of Sydney CBD and 10 km east of Parramatta CBD.

The Proposal site is located within the Chullora Technology Park, and is bounded by Muir Road to the north, Anzac Street to the east, and existing industrial development further east and to the south. Surrounding the Proposal site is a range of industrial developments including PFD Storage Warehouse and Volkswagen Distribution Centre to the north, the Tip Top Bakery and News Limited warehouses to the east and the BlueScope Steel warehouse and Veolia Greenacre Transfer Station to the south. Directly to the west of the Proposal site is a narrow strip of land owned by Rail Corporation NSW (RailCorp), which comprises part of the former railway which previously operated through this area. Several other businesses are located further to the west, including a service station, fitness centre and a range of another industrial warehouses.

The closest residential receivers are located in the suburbs of Yagoona, approximately 455 metres (m) to the southwest, and Greenacre, approximately 600 m to the east of the Proposal site.

The Chullora RRP site comprises:

- The Proposal site
- The existing site office and car parking area
- A flood detention basin and stormwater infrastructure
- A future development area
- The Cooks River stormwater canal
- A landscaping area
- A vegetated area.

2.1 Introduction

This section provides a description of the Proposal site and its history. The SEARs relating to the Proposal site, and a summary of where they are addressed, is presented in Table 2-1.

Table 2-1 SEARs (site suitability)

SEARs	Where Addressed
Suitability of the site	
• Details of all development consents applicable to the site	Section 2.3.1
• Full details of interaction with the proposed 'Stage 0' works	Section 2.3 and Section 2.6 Section 4.3 Throughout this EIS
• A detailed justification that the site can accommodate the proposed resource recovery facility and its environmental impacts and relevant mitigation measures	Section 4.5.10 Section 24.2.3

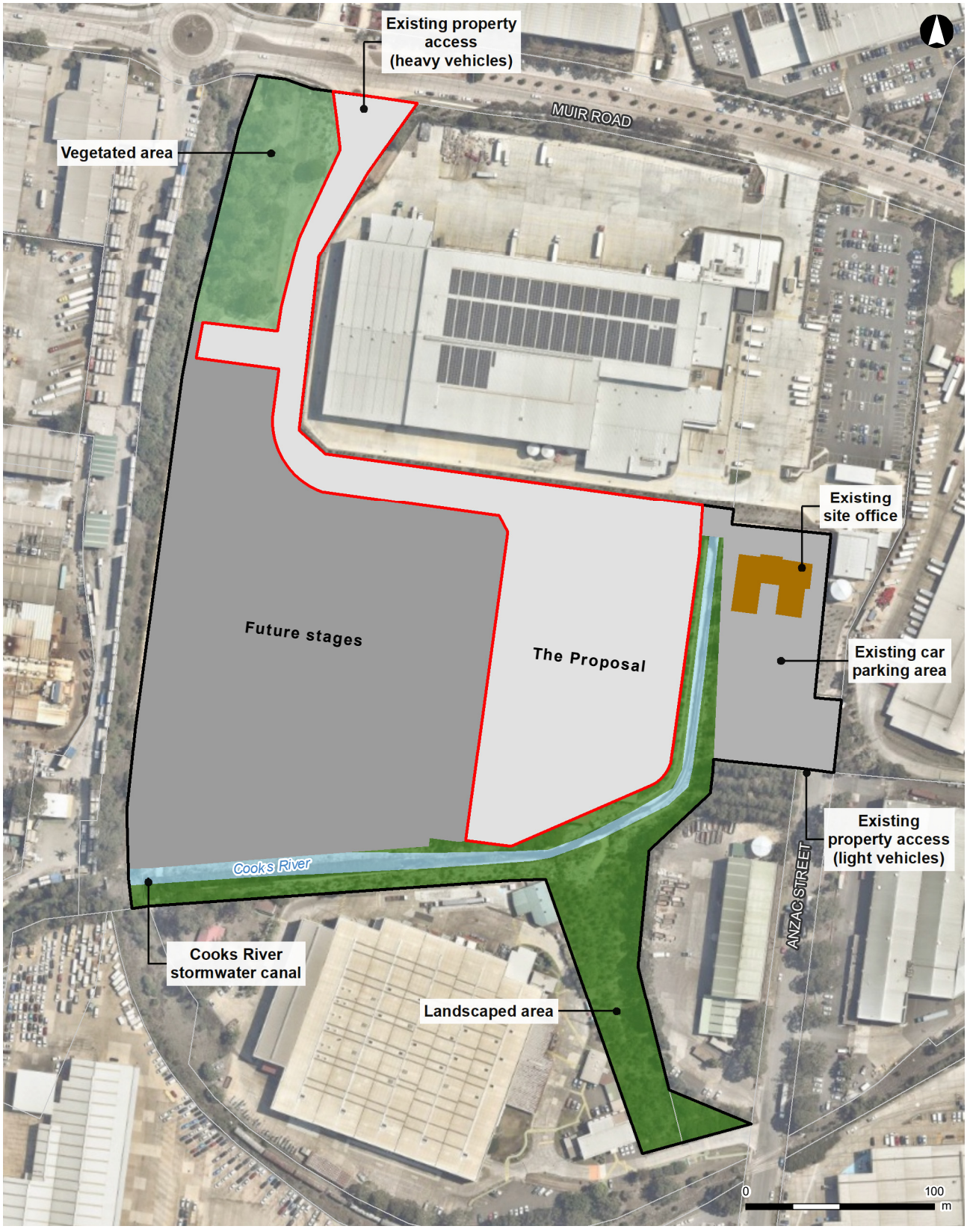
Further to the above, the Canterbury-Bankstown City Council (Council) require further details on specific requirements relating to their authority. These requirements are discussed throughout this EIS and are provided in Table 2-2 below.

Table 2-2 Other agency requirements and relevant report sections (site suitability)

Aspect	Where Addressed
A detailed review of the information appears to show that a covenant currently restricts the use of land for the purposes of waste management and disposal on Lot 1 DP 1227526. The restriction was imposed as part of the original subdivision application (DA-105/2016) of 15-19 Muir Road in Chullora (Lot 21 DP 860283) into two separate lots, 21 Muir Road being one them. However, the amended SEARs application appears to be confined to Lot 2 of DP 1227526 only.	Section 2.7 Lot 1 DP 1227526 no longer exists. The subdivision application provided for the creation of Lot 2 DP 1227526 and Lot 100 DP 1245807 (PFD Storage Warehouse). The Proposal is wholly contained within Lot 2 DP 1227526 and will not impact any covenants in place for Lot 100 DP 1245807.

2.2 The Chullora RRP

The Chullora RRP, including the Proposal site, would be developed on a 9.2 ha single parcel of land; being 21 Muir Road, Chullora (Lot 2 DP 1227526). The Chullora RRP would be developed in stages, with the MRF representing the first stage. Figure 2-1 shows the Proposal site and layout of future stages.



LEGEND

- Chullora RRP site boundary
- Proposal site
- Future stages
- Property boundary

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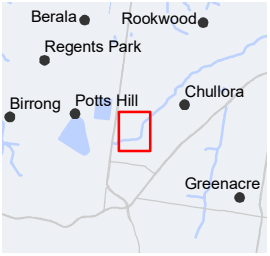


Figure 2-1: Chullora RRP stages

2.3 Chullora RRP site history

The Chullora RRP site was formerly owned by the State Rail Authority of NSW and the Railways Commissioner of NSW from the 1920s to 1996. During this time, the site functioned as a railway depot for the maintenance of electrical train carriages.

In 1996, the Waste Recycling and Processing Corporation took ownership of the Chullora RRP site and neighbouring site to the north (now occupied by the PFD Storage Warehouse). WSN Environmental Solutions (previously Waste Service NSW), a State-owned corporation, operated the site from 1997 until 2011 as a waste facility when they were acquired by SITA Australia Pty Ltd (now SUEZ). From this time SUEZ, operated the previous Chullora RRC which included a transfer station, MRF, garden organics platform and glass processing shed.

In 2016, Frasers Property acquired both the Chullora RRP site and the site to the north, leasing the previous Chullora RRC back to SUEZ for ongoing use as a waste facility. At this time, the transfer station was demolished and the site was subdivided with the northern portion developed as the PFD Storage Warehouse.

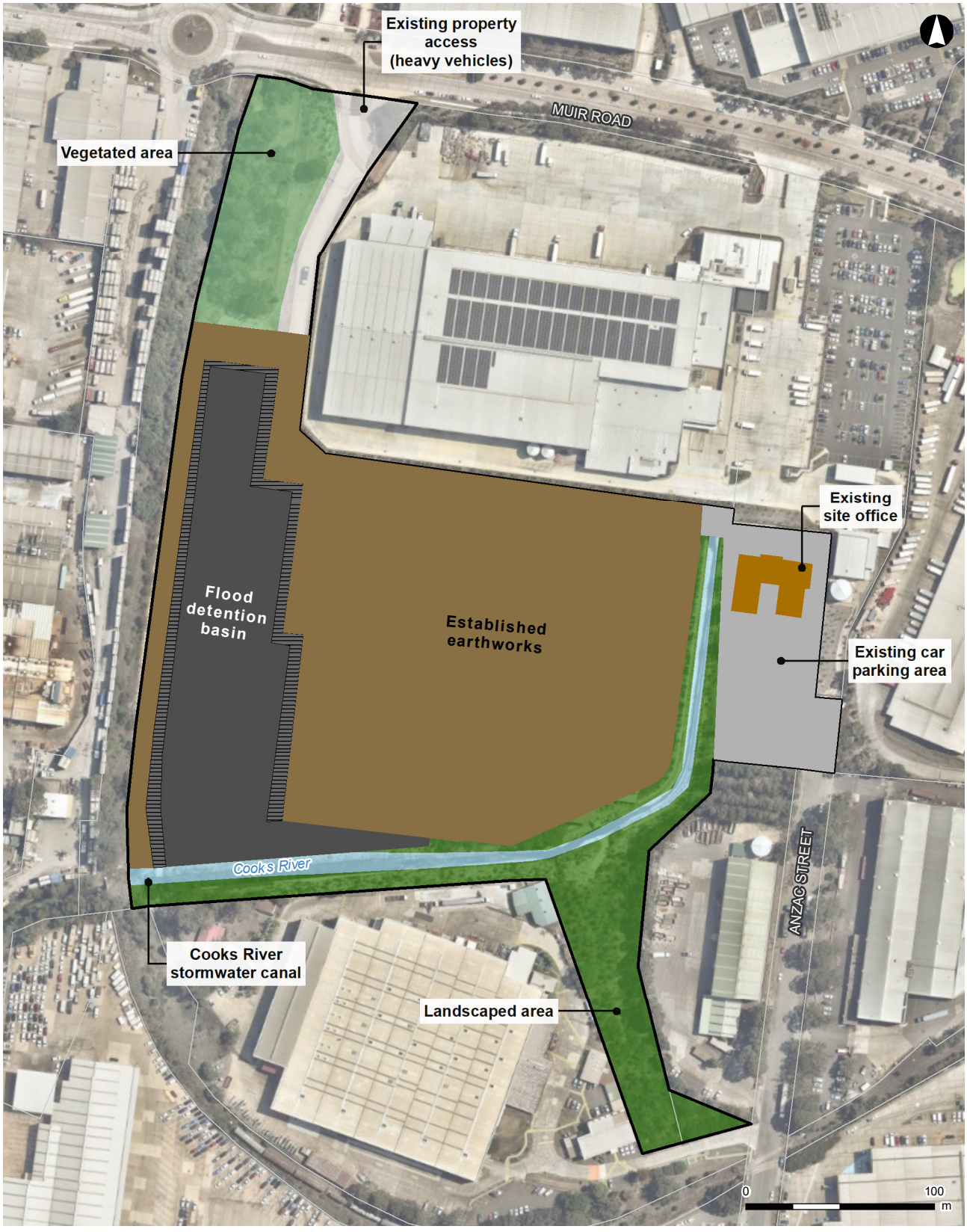
In 2017, the MRF component of the previous MRF building of the Chullora RRC was subject to a fire and was subsequently demolished, along with the glass processing shed. Following demolition of the buildings, the Proposal site was used for storage of residential waste bins as well as for the maintenance and parking of waste trucks. The Chullora RRP site retains Council approvals for a range of waste management activities, including approval for the operation of a MRF.

On the 12th May 2020 SUEZ lodged DA 366/2020 with Council for the development of flood mitigation works across the Chullora RRP site. The DA is seeking approval for early works and site establishment across the Chullora RRP site to provide flood immunity and stormwater infrastructure. The flood mitigation works include:

- Site clearance, including:
  - Demolition of temporary structures and general clean-up of the proposed site fill area and flood storage area
  - Removal of tress and other vegetation (within fill area and flood storage area)
  - Crushing of the existing concrete slab, temporary stockpiling of crushed material and reuse of it as a fill material
- Earthworks, including:
  - Cut and fill for the flood storage area
  - Construction of a flood detention basin and installation of stormwater infrastructure
  - Filling the area to the required level using existing crushed recycled concrete material and imported shale / sandstone material.

The flood mitigation works will create new baseline conditions for the Chullora RRP site, shown in Figure 2-2. The commencement of the construction of the Proposal would occur following completion of the flood mitigation works. The baseline conditions (‘existing environment”) for the Proposal are therefore the completed flood mitigation works.

Detailed plans of the final flood mitigation works are provided in Appendix L.



LEGEND

- Chullora RRP site boundary
- Established earthworks
- Batter
- Flood detention basin
- Property boundary

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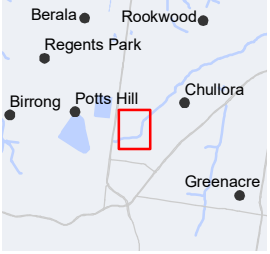


Figure 2-2: Chullora flood mitigation works - 'Existing site features for the Proposal'

2.3.1 Approved operations

The Chullora RRP site operated as the previous Chullora RRC until 2017. The previous Chullora RRC hosted a range of waste infrastructure over time including:

- A putrescible waste transfer station and green waste platform (DA 897/1994) with approval to process up to 66,000 tpa of putrescible waste
- A materials recovery facility (DA 287/1996) with approval to recycle up to 100,000 tpa of recyclable material
- A glass processing facility (DA 973/2002) with approval to process up to 40,000 tpa of glass
- Supporting infrastructure, including workshops, offices, weighbridges, a leachate pond, a small vehicle drop off area, and a trade waste area.

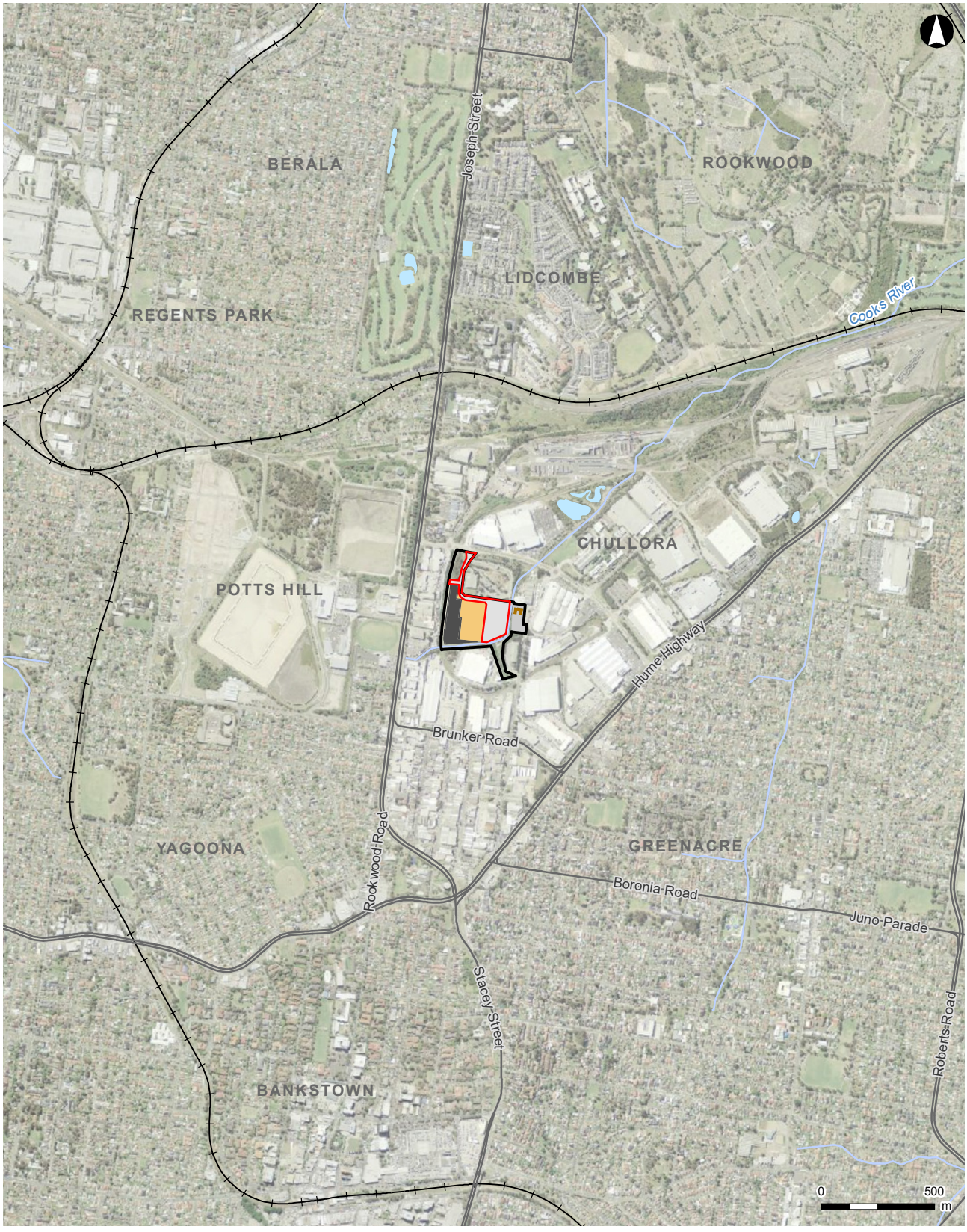
Each of the above approvals remain active for the Proposal site with each activity currently approved to be undertaken.

The previous Chullora RRC holds Environmental Protection Licence (EPL) 5893 which authorises a number of scheduled activities including, composting, recovery of general waste, and waste storage. The existing EPL could either be updated via a variation application or a new one sought for the Proposal.

2.4 Regional context and Chullora RRP site location

The Chullora RRP site is located at 21 Muir Road, Chullora (Lot 2 DP 1227526) within the Chullora Technology Park. The Chullora RRP site is located within the Canterbury-Bankstown LGA, approximately 18 km west of the Sydney CBD and 10 km east of Parramatta CBD. The Chullora RRP site is located approximately two km north of the Bankstown City Centre and 200 m east of the Rockwood Road / Muir Road intersection.

The Hume Highway, located approximately one km east of the Chullora RRP site via Muir Road, provides the main road link between the site, and the key employment and industrial areas within Sydney's West and South-Western subregions, the Sydney orbital network and the National Road Network. The Hume Highway connects with the M5 Motorway to the west providing access to the Greater Metropolitan Region and NSW road network. The Sydney Freight Terminal, operated by Pacific National, and associated rail infrastructure is located to the north of the Chullora RRP site. This facility directly connects to the Metro Rail Line (MRL) which links into the Southern Sydney Freight Line (SSFL) and Port Botany Freight Rail Line. Both rail lines provide key connectivity for freight transport from Port Botany to the Greater Sydney Region. The regional context of the Chullora RRP site is shown in Figure 2-3.



LEGEND

- Chullora RRP site boundary
- Proposal site
- Future stage
- Flood detention basin
- Existing car parking area
- Existing site office
- Major road
- Railway
- Watercourse

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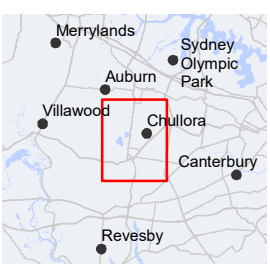


Figure 2-3: Location and regional context of the Proposal site

2.5 Local context and surrounding land uses

The local context of the Chullora RRP site, including the immediately surrounding land uses, is largely industrial in nature. The Chullora RRP site is bounded by Muir Road to the north, Anzac Street to the east and existing industrial development further east and to the south. A disused freight railway line forms the site's boundary to the west. A map of the surrounding land uses is provided with Figure 2-4. A summary of the land uses surrounding the Chullora RRP site include:

- **To the north** – to the immediate north of the Chullora RRP site is the PFD Storage Warehouse which is bounded by Muir Road. The land parcel containing the PFD Storage Warehouse comprised part of the previous Chullora RRC until 2017. Beyond Muir Road is the Volkswagen Distribution Centre and further north is the Chullora Freight Terminal operated by Pacific National. The Cooks River runs along the eastern boundary of the Volkswagen site and to the south of the Pacific National site.
- **To the south** – to the immediate south of the Chullora RRP site is the BlueScope Steel warehouse. The BlueScope Steel site is bounded on the south by a disused railway owned by the Rail Corporation NSW (RailCorp) which formed part of the former railway through the Chullora area. Further south of the Chullora RRP site is another industrial complex which includes the Pickles Auctions site.
- **To the east** – the Veolia Greenacre Transfer Station is located adjacent to the Chullora RRP site to the south-east. Further east is an industrial area comprising the Tip Top Bakery, McWilliam's Wines warehouse, Western Containers Freight & Cargo Services and the Chullora Business Park, which are bounded by Muir Road. Beyond Muir Road, are warehouse facilities operated by News Limited and Primo Foods.
- **To the west** – to the immediate west of the Chullora RRP site is a narrow strip of land owned by the RailCorp, which formed part of the former railway through this area. Further west is an industrial complex which includes a range of businesses including a BP fuel station, Anytime Fitness, Pet Care 2000 store and manufacturers including Galintel Steel and Nepean Building & Infrastructure.

Proximity to the nearest residential receivers has been determined relative to the Proposal site, rather than the broader Chullora RRP site, as this is the only area where works are proposed to be carried out as part of the Proposal. The closest residential receivers are located approximately 455 m to the southwest of the Proposal site. These include the suburbs of Yagoona, Greenacre and Bankstown as shown on Figure 2-4. The approximate distances of these suburbs to the Proposal site are provided in Table 2-3.

Table 2-3 Distance to residential suburbs from the Proposal site

Suburb	Approximate distance from Proposal site
Regents Park	600 m northwest
Greenacre	600 m east
Bankstown	1100 m south
Yagoona	455 m southwest
Potts Hill	960 m west



LEGEND

- Chullora RRP site boundary
- Proposal site
- Future stage
- Flood detention basin
- Established earthworks
- Existing car parking area
- Existing site office
- Education facility
- Industrial receiver
- Recreational area
- Sensitive residential receiver
- Cooks River stormwater canal
- Landscaping area
- Vegetated area

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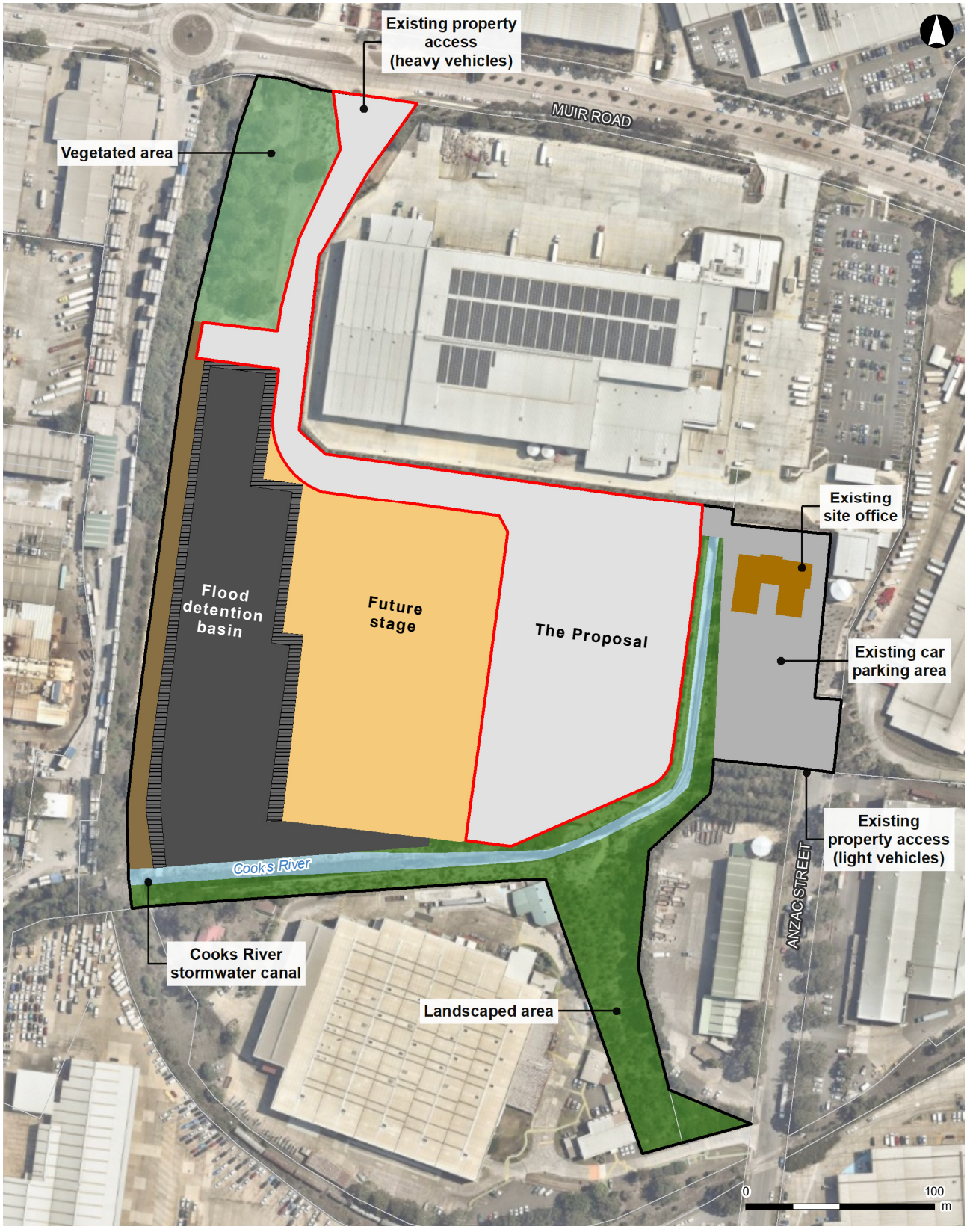


Figure 2-4: Nearby sensitive receivers to the Proposal site

2.6 Chullora RRP site features

The Chullora RRP site would be developed in multiple stages, with the MRF comprising the first stage of the Proposal. Section 2.3 provides a history of the Chullora RRP site, noting that SUEZ have recently submitted an application to develop flood mitigation works across the Chullora RRP site. Upon completion of the MRF the Chullora RRP would comprises the following elements (shown on Figure 2-5):

- The Proposal site – comprising a 2.5 ha developable area for the construction and operation of the MRF and internal roads and supporting infrastructure
- The existing site office and car parking area - comprising the 0.7 ha eastern portion of the Proposal site
- A flood detention basin and stormwater infrastructure – comprising the 1.7 ha area in the western portion of the Chullora RRP site
- The future development area – comprising the 1.8 ha central portion of the Chullora RRP site
- The Cooks River stormwater canal
- A 1.2 ha landscaping area comprising the southern portion of the Chullora RRP site
- A 0.44 ha vegetated area in the north-western corner of the Chullora RRP site.



LEGEND

- Chullora RRP site boundary
- Proposal site
- Future stage
- Established earthworks
- Batter
- Flood detention basin
- Property boundary

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Coordinate System: GDA 1994 MGA Zone 56
Date issued: August 3, 2020
Aerial imagery source: nearmap Jan 2020

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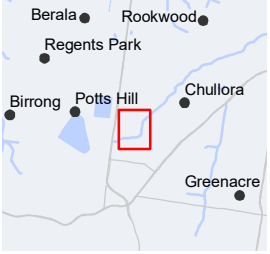


Figure 2-5: Chullora RRP site features

2.6.1 The Proposal site

The Proposal site, prior to construction of the Proposal, comprises a levelled established earthworks platform; raised above the 1 in 100-year flood level. The existing features of the Proposal site include a formalised access driveway for heavy vehicles to enter the Proposal site from Muir Road. The access point for heavy vehicles is approximately 200 m east of the Muir Road / Rookwood Road intersection. This access point has recently been repaved and upgraded (refer Section 4.3.3). This access provides for a left-turn out of the site onto Muir Road and a right and left turn into the site from Muir Road.

2.6.2 Existing site office and car parking area

The eastern portion of the Chullora RRP site comprises the existing site office and car parking area, which is characterised by a single storey site administration building with a floor space area of 830 m2 and associated parking area connected to a secondary access off Anzac Road which provides access for light vehicles. The car parking area includes 70 onsite car parking spaces: 10 adjacent to the administration building and 60 spaces in a larger parking area approximately 20 m to the south of the building. Pedestrian access from the site office to the greater Proposal site is provided by a walkway and bridge over the stormwater canal. Patches of planted vegetation are located along the boundary of the administration building and along internal walkways within the eastern portion of the Proposal site.

2.6.3 Flood detention basin and stormwater infrastructure

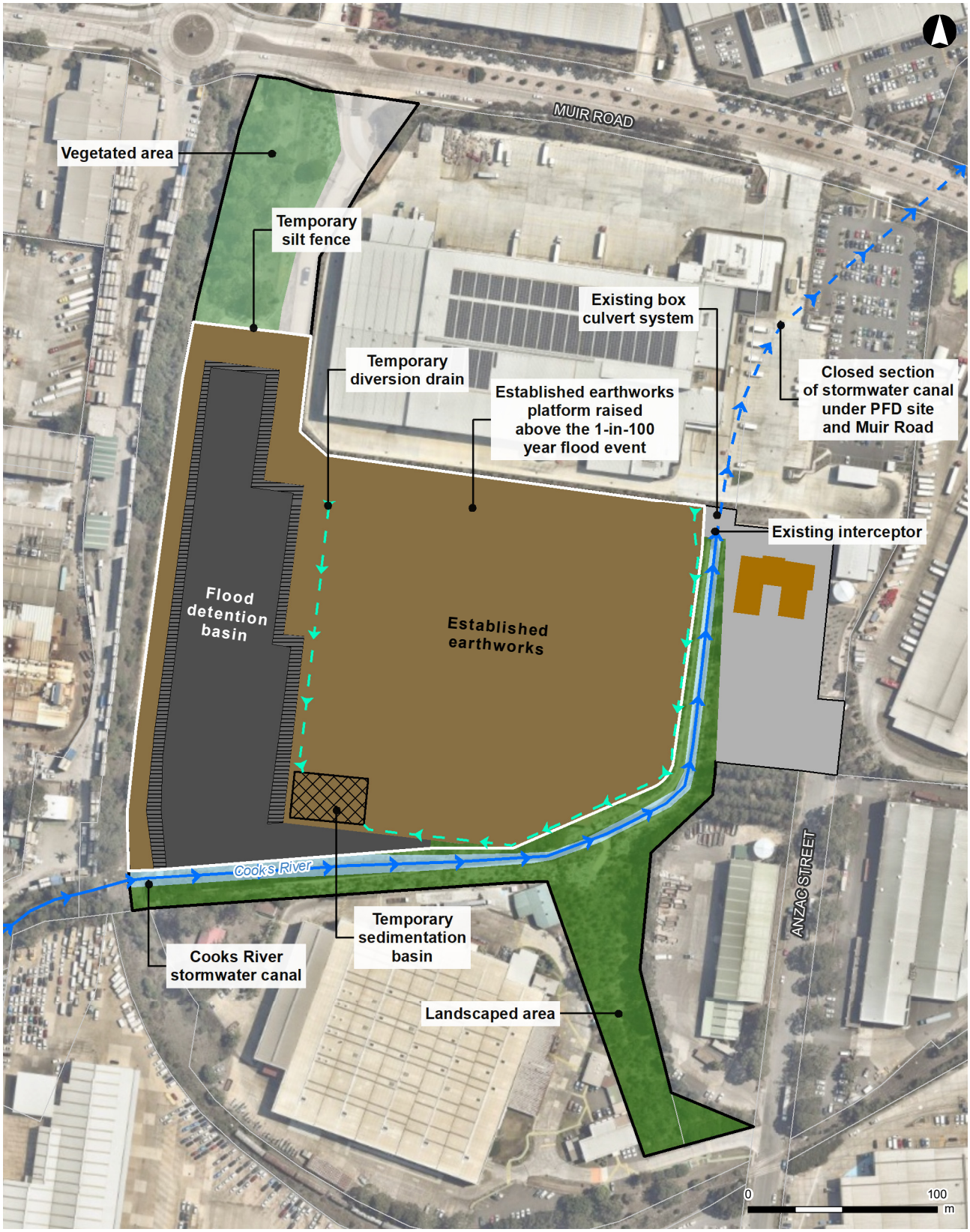
The western portion of the Chullora RRP site comprises a flood detention basin which will have been established prior to the commencement of the construction of the Proposal (subject to DA 366/2020). The flood detention basin would provide over 22,100 m^3 of flood storage. Further detail regarding the flood detention basin is provided in Section 4.3.7 and Appendix L.

The Cooks River stormwater canal (refer Section 2.6.5) provides the key infrastructure for the conveyance of surface water flows. Stormwater on the Chullora RRP site is currently diverted through a trunk drainage system. This system consists of a concrete drainage channel, unformed irregular open channel and closed box culvert system and includes an existing interceptor. The drainage channel forms the upper reaches of the Cooks River and extends through the Chullora RRP site from the southwest to north-east at an average grade of 2.5 per cent. The land to the north and west of the system is relatively flat and drains to low points in the area and into the concrete channel.

Temporary stormwater quality infrastructure would also be installed across the Chullora RRP as part of the flood mitigation works (DA 366/2020) and would be in place at the commencement of construction of the Proposal. This infrastructure would include (refer Figure 2-6):

- A sediment basin located in the south-western corner of the future development area, with capacity for up to five days rainfall at 85th percentile intensity
- Silt fences
- Diversion drains diverting stormwater to the Cooks River stormwater canal.

Appendix L provides further detail on the existing stormwater infrastructure across the Chullora RRP site.



LEGEND

- Chullora RRP site boundary
- Batter
- Flood detention basin
- Property boundary
- Established earthworks
- Existing car parking area
- Existing site office
- Stormwater drainage

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Figure 2-6: Existing water and hydrology infrastructure

2.6.4 Future development area

The central portion of the Chullora RRP would be developed as a future stage of the Chullora RRP and would be subject to a separate DA. No works are proposed in this area as part of the Proposal.

2.6.5 Cooks River stormwater canal

The Chullora RRP site is traversed by the Cooks River stormwater canal which runs in a west to easterly direction along through the southern portion of the Chullora RRP site, then in a northerly direction between the Proposal site and the existing site office and car parking area. The western extent of the stormwater canal comprises approximately 220 m of natural channel; the mid-section covers 320 m of new hard channel and naturalised vegetated overbank overflow zones; and the final section comprises 360 m of covered culverts. No changes are proposed to the stormwater canal as a result of the Proposal

2.6.6 Landscaping area

The southern portion of the Chullora RRP is characterised by landscaping and vegetation. The vegetation along the Cooks River tributary and across the landscaping area consists of both native and exotic plantings. The exotic plantings, including *Acacia saligna* (Golden Wreath Wattle), *Lantana camara* (Lantana), *Cirsium vulgare* (Spear Thistle) *S. rhombifolia and Pennisetum clandestinum* (Kikuyu) is predominantly found in the southwestern portion of the Chullora RRP site.

2.6.7 Vegetated area

The 0.44 ha vegetation to the northwest of the Chullora RRP site is classified as Cooks River/Castlereagh Ironbark Forest, which is listed as an Endangered Ecological Community (EEC) under the NSW *Biodiversity Conservation Act 2016* (BC Act). This EEC is also listed under the *Environmental Protection and Biodiversity Conservation Act* (EPBC Act), however, due to the size and condition of his patch, it does not meet the thresholds for protection. This area is proposed to be protected with no portion of the Proposal included in this area.

2.7 Legal description, ownership and consent

The Proposal site is located at 21 Muir Road and wholly contained within Lot 2 DP 1227526. This land, as well as the adjacent Lot 100 DP 1245807, has been owned by Frasers Property since 2016. The Proposal site is leased back to SUEZ; however, the adjacent Lot 100 DP 1245807 has been subdivided and separately developed by Frasers Property for purposes of the PFD Storage Warehouse. Landowners consent is provided in Appendix D of this EIS.

The Chullora RRP site and surrounding lots are zoned IN1 General Industrial within the *Bankstown Local Environmental Plan 2015* (BLEP 2015). The Proposal site is traversed by several easements for utilities, including stormwater, drainage, sewerage, electricity, water supply and vehicular access.

Table 2-4 Properties potentially affected by the Proposal

Lot	DP	Property address / description	Owner	Within Proposal site footprint
100	DP 1245807	15 Muir Road	Frasers Property	No
102	DP 1067379	-	RailCorp	No

Conclusion

The Chullora RRP, including the Proposal site, would be developed on a 9.2 ha single parcel of land; being 21 Muir Road, Chullora (Lot 2 DP 1227526). The Chullora RRP would be developed in stages, with the MRF representing the first stage.

The Proposal site was previously operated as the Chullora RRC which has subsequently been demolished. SUEZ have recently lodged a DA to develop flood mitigation works across the Chullora RRP site, which would be finalised prior to the construction of the Proposal.

The Chullora RRP site is located within the Chullora Technology Park and is generally surrounded by industrial uses, with extensive separation distances to the nearest residential receivers (minimum 455 m).

The Chullora RRP comprises the Proposal site, as well as a number of other features; including the existing site office and car parking area, a flood detention basin, a future development area, the Cooks River stormwater canal, a landscaping area and a vegetated area.

Landowners consent has been provided by Frasers Property who owns the Chullora RRP site (provided in Appendix D of this EIS).

3 PROPOSAL JUSTIFICATION, NEED AND ALTERNATIVES

Summary

The conventional model of recycling that has been historically adopted across Australia is facing considerable disruption and greater vulnerability. This disruption puts recycling outcomes across Australia, including Greater Sydney, at risk. Global market risks, policy drivers and diminishing recycling capacity are all contributing to the need for the Proposal, namely:

- MRF capacity in the Metropolitan Levy Area (MLA) is constrained and at risk of decline, compromising the ability to meet NSW Government waste policy goals. If waste generation holds steady at 2017-18 rates until 2021-22, 1.07 million tonnes of MRF capacity would be needed in the MLA just to achieve the MSW resource recovery target of 70 per cent. The additional processing capacity offered by the Proposal both supports the NSW Government policy goal to increase recycling and improves the security of kerbside recycling during a period of significant disruption
- Global markets are becoming more constrained. International market uncertainty has significantly challenged the conventional recycling model of a basic 'sort and export'. The Proposal is a direct response to these challenges as it adopts a 'pull through' model, which starts by securing local offtake markets in order to define output product specifications, and has been designed to meet those requirements
- The export ban on unrefined materials introduced by the Commonwealth government is promoting investment in materials reprocessing. The Proposal is in strong alignment with the intended ban
- The introduction of National Packaging Targets by the Commonwealth government will require a major expansion in the recycling rate of plastic packaging, including additional sorting capacity. The Proposal would support delivery of the National Packaging Targets
- The Proposal supports the emergence of a circular economy within Australia. It demonstrates the critical shift in approach, from producing generic low cost, low grade materials to a pull through model that conceives of the sorting, reprocessing and specified end uses as an integrated, closed loop solution.

The Proposal, forming part of the overall Chullora RRP, represents critical infrastructure that will be required to facilitate the export ban on unrefined recycling streams, facilitate circular economy flows and build the resilience of the local recycling sector. In addition, the Proposal supports the objectives of a range of strategic planning policies, including:

- NSW Waste Avoidance and Resource Recovery Strategy 2014-21 (NSW EPA, 2014a)
- National Waste Policy: Less Waste, More Resources (Australian Government, 2018)
- NSW 2021: A Plan to Make NSW Number One (NSW Government, 2011)
- Greater Sydney Region Plan: A Metropolis of Three Cities (Greater Sydney Commission, 2018a)
- South District Plan (Greater Sydney Commission, 2018b)
- Canterbury-Bankstown Community Strategic Plan 2028 (Council, 2018)
- NSW Circular Economy Policy Statement – Too Good to Waste (NSW EPA, 2019a).

A range of alternatives have been considered for the Proposal, comprising a 'do nothing' scenario, alternative sites and alternate site configurations and layouts. Each of these alternatives have been discarded as they would not adequately address the Proposal's objectives or address the critical need for the Proposal.

3.1 Introduction

This section outlines the need and justification for the Proposal. It also provides a description of the alternatives for the Proposal which have been considered. The SEARs relating to the Proposal need and justification, and a summary of where they are addressed, is presented in Table 3-1.

Table 3-1 SEARs (Proposal justification, need and alternatives)

SEARs	Where Addressed
General requirements	
The Environmental Impact Statement (EIS) for the development must meet the form and content requirements in Clauses 6 and 7 of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000.* In addition, the EIS must include a: • Detailed description of the development, including: – Need for the proposed development	Section 3.2
– Justification for the proposed development	Section 3.2
Waste management	
• The measures that would be implemented to ensure that the development is consistent with the aims, objectives and guidance in the *NSW Waste Avoidance and Resource Recovery Strategy 2014- 2021*	Section 3.3.1

Further to the above, Council require further details on specific requirements relating to their authority. These requirements are discussed throughout this EIS and are provided in Table 3-2 below.

Table 3-2 Other agency requirements and relevant report sections (Proposal justification, need and alternatives)

Aspect	Where Addressed
Council's recently endorsed *Local Strategic Planning Statement* (LSPS), Connective City 2036 identifies Chullora as an innovation and high technology employment area with a greater focus on innovation and high technology jobs. The EIS should demonstrate how the proposal can achieve the vision for Chullora. In addition, the surrounding uses within this industrial area includes food manufacturing services. Details on the protection of these manufacturing services should be provided, in addition to a response about consistency with the LSPS.	Section 3.3.7 Impacts on surrounding land uses, including industrial land uses, are assessed throughout this EIS

3.2 Proposal need and strategic justification

From the introduction of kerbside recycling into Australia in the early 1980s, the primary focus has been on optimising collection to reduce transport costs in a country as large as Australia. In addition, the rise of the manufacturing economies in Asia underpinned a growing demand for feedstocks and a steady flow of returning empty shipping containers, which together facilitated a growing global reliance on Asia as the end market for many types of recycled commodities.

In 2018-19, 55 per cent of the key recycled commodities (metals, plastics and paper / cardboard) went to domestic end markets, while 45 per cent of materials were exported (Department of Agriculture, Water and Environment (DoAWE, 2019a).

This prioritisation of collection over other parts of the recycling chain underpinned the commingling of different recycling streams in a single bin and led to an increase in the number of high compaction

collection vehicles that optimised collection efficiency, but increased contamination due to breakage. At the same time, the national network of MRFs, despite ranging in technological sophistication, mostly lacked the technical capacity to sort co-mingled, highly contaminated municipal waste into material types with low levels of contamination (DoAWE, 2019b).

That conventional model of recycling is now fundamentally flawed due to a number of factors which have resulted in significant disruption to the recycling business and increased vulnerability around recycling outcomes in Australia, including Greater Sydney. These factors are described in detail in Section 3.2.1 to Section 3.2.5, and include:

- The insufficient MRF capacity in the Metropolitan Levy Area (MLA) and ability to meet NSW Government waste policy goals. The MLA area extends 350 km from Nowra in the south to the Hunter in the north
- Global market disruption and industry impacts
- The proposed export ban for key materials
- The introduction of National Packaging Targets
- An increasing need to align with the emerging principles of a circular economy.

The combination of global market risks undermining the recycling sector, and local policy drivers pushing to increase recycling (including the NSW Government's 2021 recycling targets, the all-of-government National Packaging Targets and the intended national ban on export of unrefined recyclables) is increasing the need for MRF capacity.

With recycling capacity at risk of contraction and the emergence of a critical requirement to develop local end markets for recycled materials, there is a clear and compelling case for a new MRF (like the Proposal) to be developed to meet the specifications of associated end market applications. The Proposal recognises the conventional recycling "push" model of highly contaminated recyclables to Southeast Asian Markets is no longer acceptable to the community, nor it is financially sustainable. There is a need to focus on finding local solutions that focus on high quality materials, adding value to recovered resources and utilising those materials locally to create truly circular loops.

3.2.1 Materials recovery capacity

More than 1.2 million tonnes of MSW were recovered across the MLA in 2017-18, with commingled kerbside materials accounting for more than 52 per cent of that, or approximately 630,000 tonnes (based on the state-wide composition of recovered materials, including organics and other minor streams) (NSW EPA, 2019b). A further 1.47 million tonnes were recycled from C&I sources in the MLA in 2017-18.

It is challenging to estimate the volume of commingled recycling processed through MRFs given the diversity of C&I recycling streams and the significant proportion that remain source separated. Paper / cardboard accounted for 36 per cent of C&I recyclables in NSW and glass and plastic each constituted 1.6 per cent, while the 29 per cent of metals was mostly from industrial sources and end of life vehicles.

Only a small number of MRFs currently service the MLA. Further, a number of MRFs have recently closed across the MLA; including the Polytrade Rydalmere facility, Taren Point facility and the Gateshead MRF. The Visy Smithfield MRF is the largest currently operating facility servicing the MLA, processing an estimated 250,000 tpa. While a number of other smaller MRFs are currently in operation, including the Spring Farm Resource Recovery Centre (50,000 tpa), Somersby MRF (80,000 tpa) and the Shoalhaven Resource Recovery Facility (<40,000 tpa), there is a noticeable shortage of MRFs with high processing capacities within the MLA and, in particular, within Sydney.

The need for MRF capacity is anticipated to increase through the demand driver of the WARR Strategy. Current recycling performance in NSW is far below the WARR targets to recycle 70 per cent of both MSW and C&I waste by 2021-22. MSW recycling was at only 42 per cent in 2017-18 (latest available data) and C&I recycling at 53 per cent (NSW EPA, 2019b).

If waste generation holds steady at 2017-18 rates until 2021-22, 1.07 million tonnes of MRF capacity would be needed in the MLA just to achieve the MSW target (in addition to organics and other recycling); which is well above the total current capacity across the MLA. Processing for C&I streams would further ramp up demand for commingled sorting capacity.

Given the challenge and timeframe to develop new waste facilities in NSW, there appears to be little buffer in the supply and demand of MRF capacity, particularly given the supply side constraints of industry disruption noted above.

Processing is concentrated in a small number of facilities. This risk is exacerbated by the Visy Smithfield MRF accounting for more the majority of aggregate annual capacity in the MLA and the recent closure of a number of facilities. The limited redundancy in the recycling fleet exposes the extended metropolitan region to the risk of failure in any of these facilities, noting a number of MRFs in NSW, Victoria and Western Australia have been forced to close in recent years due to either fire or insolvency. Major Victorian recycler SKM went into liquidation in 2019, resulting in the landfilling of significant volumes of recyclables in Victoria and South Australia, Polytrade shuttered its Sydney facility and the Cleanaway MRF in Perth suffered a major fire in 2020 and it is not clear whether it will be rebuilt.

The additional processing capacity offered by the Proposal both supports the NSW Government policy goal to increase recycling and improves the security of kerbside recycling during a period of significant disruption.

3.2.2 Global market constraints

China has long been established as the world's largest importer of recyclable materials, previously accounting for up to 30 per cent of Australian recycled exports (1.3 million tonnes in 2017-18) (DoAWE, 2019a). However, in 2018 China introduced import restrictions on 24 types of recycling commodities that reduced the maximum allowable contamination in those streams from 5–10 per cent to between 0.5 and 1 per cent, depending on the material. Recyclers in Australia, and most other developed countries, were unable to achieve the specified purity from lower grade, commingled recyclables without significantly increasing costs; effectively closing off the Chinese market to these streams.

Recyclers have continued to find offshore markets, with total export volumes reducing by only two per cent between 2017-18 and 2018-19 to 4.4 million tonnes (DoAWE, 2019c), however this is likely to be a temporary solution as alternate markets reach capacity or introduce similar import restrictions. All of Australia's major recycling export markets, with the exception of Bangladesh, have subsequently introduced or announced a variety of import controls, ranging from tightened inspections to pending bans on scrap plastic (DoAWE, 2019c). These reforms have created significant volatility in export end market demand and prices, both of which have fallen significantly since mid-2019 (see Table 3-3).

Table 3-3 Comparison of monthly waste export volumes and values (adapted from DoAWE, 2020a)

Export destination (ranked by tonnes since July 2018)	Tonnes					Value			
	Jan-20		June-19		2018-19 monthly avg	Jan-20	June-19	% change	2018-19 monthly avg
	Tonnes	% of total	Tonnes	% change		$ mil	$ mil		
Indonesia	46,000	18%	43,000	7%	60,000	$10.1	$16.2	-37%	$23.7
Vietnam	31,000	12%	75,000	-59%	61,000	$11.2	$33.9	-67%	$29.8
India	50,000	19%	50,000	0%	49,000	$22.5	$29.9	-7%	$33.5
China	25,000	10%	45,000	-44%	54,000	$24.1	$28.6	-16%	$41.6

Export destination (ranked by tonnes since July 2018)	Tonnes					Value			
	Jan-20		June-19		2018-19 monthly avg	Jan-20	June-19	% change	2018-19 monthly avg
	Tonnes	% of total	Tonnes	% change		$ mil	$ mil		
Bangladesh	16,000	6%	85,000	-81%	25,000	$6.2	$36.6	-83%	$11.2
Malaysia	21,000	8%	57,000	-63%	27,000	$9.3	$11.6	-20%	$10.4
Thailand	20,000	8%	21,000	-5%	20,000	$6.8	$7.8	-13%	$7.9
Korea	8,000	3%	36,000	-78%	15,000	$43.0	$23.1	86%	$32.6
Taiwan	14,000	5%	13,000	7%	13,000	$5.3	$8.5	-37%	$8.3
NZ	2,000	1%	7,000	-71%	6,000	$4.8	$6.7	-28%	$5.7
Top 10 total	*234,000*	*91%*	*431,000*	*-45%*	*330,000*	*$143.3*	$202.9	*-60%*	*$204.5*
Monthly total	**257,000**	**-**	**460,000**	**-44%**	**369,000**	**$175.9**	**$260.4**	**-32%**	**$258.8**

The impact varies considerably between streams, with paper / cardboard and plastics the most exposed to export markets as the biggest single volume and largest percentage exported.

Paper / cardboard exports were 27 per cent lower in 2018-19 than in 2015-16, while exports of scrap plastics were 7 per cent lower than their 2015-16 peak, despite local reprocessing being smaller today than it was in 2005 (Figure 3-1). Local plastics reprocessing may need to increase by up to 400 per cent to counter the closure of export markets, requiring new market outlets for recycling plastic resin, both into packaging and other applications (DoAWE, 2019c).

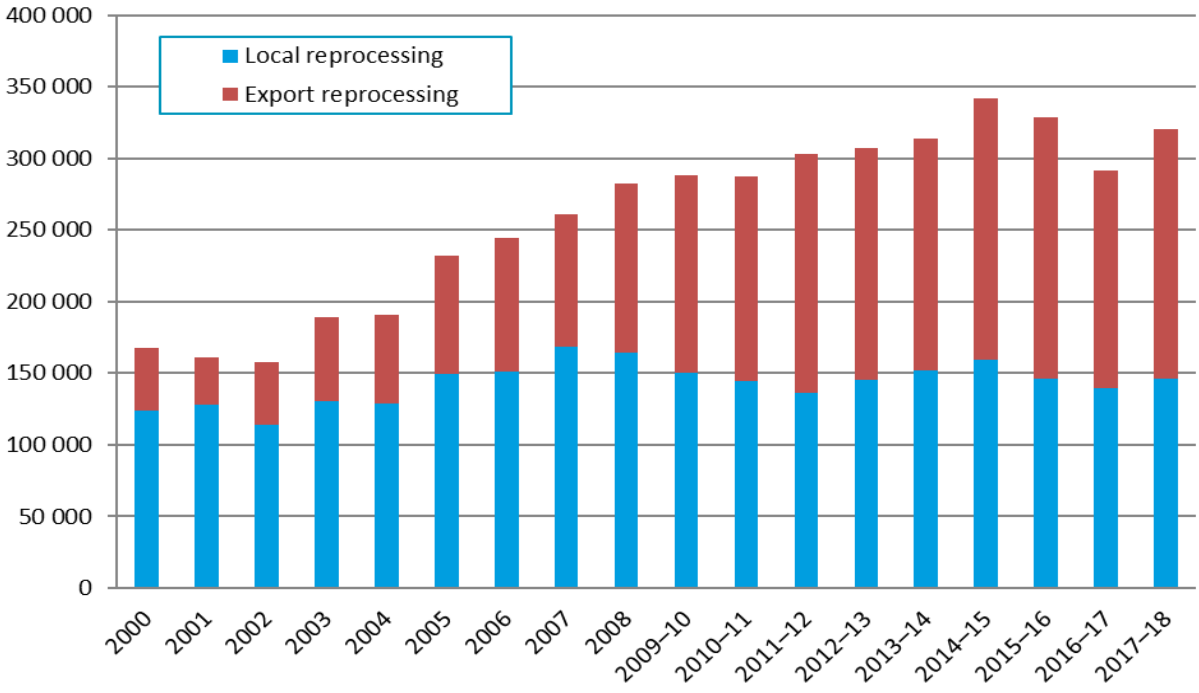


Figure 3-1: Annual plastics recovery 2000 to 2017-18, by location of reprocessing (tonnes) (DoAWE, 2019c)

This market uncertainty has significantly challenged the conventional recycling model of a basic sort and export. The Proposal is a direct response to the challenges outlined above as it adopts a 'pull through' model, whereby it starts by securing local offtake markets in order to define output product specifications, and then designs the sorting process to meet those requirements. It is a systemic approach to the management of recyclables that starts by considering their value and works backwards to optimise that value.

3.2.3 Export ban on unrefined materials

The Commonwealth government has responded to the fragility of the global situation by proposing a ban on waste exports under the National Waste Policy.

In August 2019, Australian governments through the Council of Australian Governments (COAG) announced a plan to phase in bans on scrap paper, plastic, glass and tyres that has not been subject to some form of value-adding. These four materials collectively accounted for 1.4 million tonnes of exports in 2018-19 (Figure 3-2).

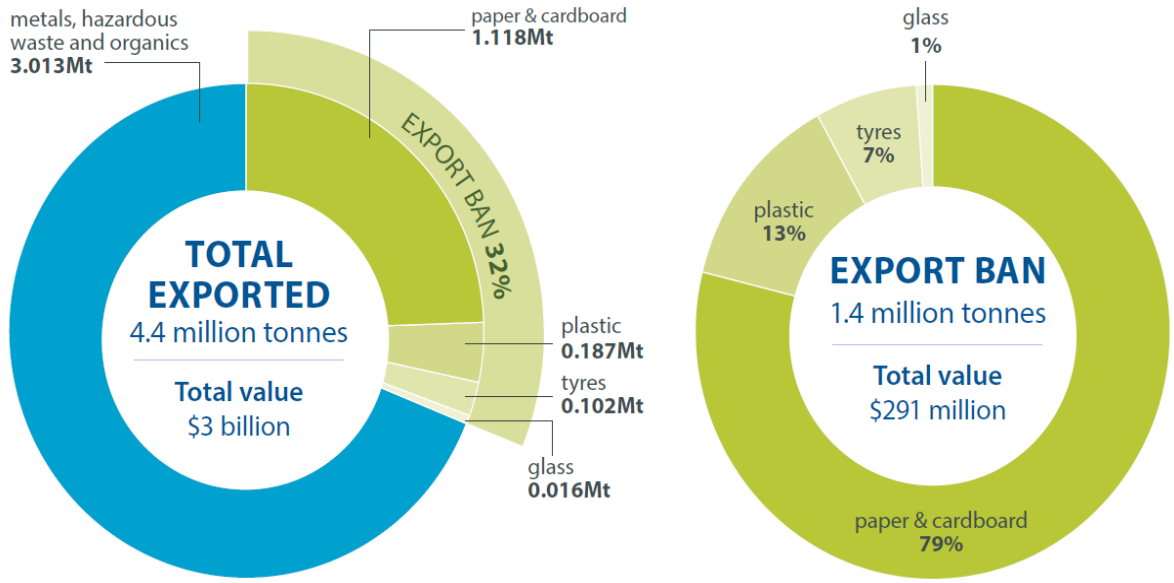


Figure 3-2: A breakdown of Australian waste exports, 2018-19 (DoAWE, 2019d)

The individual bans, proposed for progressive introduction between 2020 and 2022, are intended to facilitate investment in advanced sorting and materials reprocessing in order to produce a product that is tailored to the specifications for remanufacturing. The COAG discussion paper proposes the following minimum value-adding requirements for the kerbside recycling streams:

- Plastic – Clean plastics sorted to a single resin type and processed ready for further use (e.g. flakes and pellets)
- Paper – Paper pulp
- Glass – Washed, colour sorted cullet ready for further use.

There is considerable uncertainty about the economics of undertaking local value-adding in order to supply export markets, given the higher costs and smaller scale in the Australian economy. It is anticipated that domestic end markets will represent an important part of the solution.

The Proposal has also recently secured grant funding from the NSW EPA's Major Resource Recovery Infrastructure Grants Program. This funding was provided due to the Proposal's utilisation of innovative fibre and plastic beneficiation technologies which will ensure that high value recycled products are produced for sale to local markets.

Fibre beneficiation includes the de-contamination and sorting of fibre into clean cardboard, newspaper and mixed paper to the standard for sale to local paper mills. Plastics beneficiation includes the sorting of mixed plastics to produce valuable plastics flakes for sale to local recycled plastics manufacturers.

Through the utilisation of fibre and plastics beneficiation technologies, the Proposal would ensure that more than 90 per cent of plastics and fibres would be recovered and sold to local recycled plastic and paper manufacturers. In doing so, the Proposal would reduce the dependence on local landfills and international export markets for recycled plastics and fibres. This would also support economic growth within the local recycling manufacturing industry and promote a transition to sustainable use of materials.

3.2.4 National Packaging Targets

In April 2018, the Commonwealth, state, and territory governments agreed to a suite of ambitious targets for packaging to reduce national waste generation and increase local resilience. Among the four key National Packaging Targets are, that by 2025:

- One hundred per cent of all Australia's packaging will be reusable, recyclable or compostable
- Seventy per cent of plastic packaging will be recycled or composted
- Packaging will include, on average, thirty per cent recycled content.

It is likely that the 70 per cent target will be primarily achieved by recycling rather than composting. Recycling will provide recycled material to support the second target and will avoid potential issues with composting plastic. An advanced composting facility is required to compost biodegradable plastics, including those compliant with the Australian Standard for biodegradable plastics (AS4736-2006), and there are few in-vessel composting facilities nationally. There are also regulatory risks around compostable bags, such as Victoria including them within its 2019 bag ban (DoAWE, 2019e) and other jurisdictions expressing caution.

The most straightforward pathway to achieving the 70 per cent target is to increase recycling. This will require a major expansion in the overall plastic packaging recycling rate of 27.6 per cent (DoAWE, 2019e), including additional sorting capacity.

The Proposal would support the delivery of the National Packaging Targets, which are supported by all of government and are being delivered by the Australian Packaging Covenant Organisation (APCO) and its 1,400 industry members.

3.2.5 A local circular economy

A broader shift towards a commitment to the concept of a circular economy has been sparked by the end of the linear approach to resources facilitated by the low-value push model of recycling. The National Packaging Targets are one expression of that intention, but governments and industry are increasingly focused on designing, managing and procuring resources in a more sustainable fashion.

In February 2019, the EPA published the *NSW Circular Economy Policy Statement - Too Good to Waste* (NSW EPA, 2019a), which has been supported by initiatives such as establishment of the NSW Circular Economy Innovation Network under the auspices of the NSW Chief Scientist & Engineer Professor.

The Proposal supports the emergence of a circular economy within Australia. It demonstrates the critical shift in approach, from producing generic low cost, low grade materials to a pull through model that conceives of the sorting, reprocessing and specified end uses as an integrated, closed loop solution.

The Proposal represents critical infrastructure that will be required to facilitate the export ban on unrefined recycling streams, facilitate circular economy flows and build the resilience of the local recycling sector. While the integrated nature of the solution represents an innovative approach, the use of advanced but mature sorting technology provides a facility that is characterised by low technical risk as well as low environmental risk and impact.

3.2.6 Other benefits

The Proposal would result in a number of additional other benefits during construction and operation, namely:

- Reducing the potential for impacts to the natural environment (e.g. land clearing) compared to a greenfield site by utilising an existing brownfield industrial site for development
- Improved environmental benefits compared to the previous Chullora RRC by providing a state-of-the-art fully enclosed facility
- Direct and indirect economic and social benefits both locally and regionally through:
  - Providing employment for up to 30 full time equivalent (FTE) positions during the 12 month construction period
  - Creating up to 45 FTE positions during the operation of the Proposal
  - Capital investment in the region of up to $54 million, creating the potential for procurement from regional providers, suppliers and subcontractors (a Capital Interment Value (CIV) report is provided in Appendix C).

3.3 Consistency with strategic planning policies

3.3.1 NSW Waste Avoidance and Resource Recovery Strategy 2014-21

The *Waste Avoidance and Resource Recovery Act (WARR Act) 2011* establishes the waste hierarchy that prioritises avoidance, recycling and finally disposal. The key waste policy tool under this framework is the NSW WARR Strategy (NSW EPA, 2014a), which sets goals that provide a framework for sustainably managing waste and resources for 2014-21. The Strategy supports the priorities set in NSW 2021: A Plan to Make NSW Number One (NSW Government, 2011), which commits to reducing the impact of waste on the environment and community. Six Key Result Areas are developed as part of this Strategy, including the following applicable to the Proposal:

- **Key Result Area 2: Increase recycling targets** for the improvement of recycling rates by 2021-22 including, increasing C&I recycling to 70 per cent. The Proposal seeks to establish a state-of-the-art MRF which would process up to 172,000 tpa of co-mingled and source separated materials from C&I and municipal sources. This would mitigate significant capacity constraints currently impacting the Sydney region and provide advanced recycling processes to build resilience within the current network
- **Key Result Area 3: Divert more waste from landfill** targets of 75 per cent diversion of waste from landfill by 2021-22, an increase of 12 per cent from 2010-11 levels. The Proposal would support this target by achieving an increased diversion of waste from landfill by expanding recycling capacity within the Sydney basin.

Overall, the Proposal would form a key piece of waste infrastructure for enabling Sydney to achieve and promote the objectives of the WARR Strategy.

3.3.2 National Waste Policy: Less Waste, More Resources

The National Waste Policy: Less Waste, More Resources (Australian Government, 2018) outlines the federal government's direction for waste management in Australia through to 2030. The policy provides a national framework for collective action by public and private sectors, particularly resource recovery industries, to improve the management of waste resources and promote sustainable and innovative solutions to growing challenges facing waste management in Australia. This Policy also supports national engagement in the United Nations (UN) *Sustainable Development Goal (SDG) 12: Responsible Consumption and Production.*

The outcomes intended to be achieved under the Policy include the following:

- Australia manages waste, including hazardous waste, in an environmentally safe, scientific and sound manner, and has reduced the amount per capita of waste disposed
- Waste streams are routinely managed as a resource to achieve better environmental, social and economic outcomes
- Australia has increased the amount of products, goods and materials that can be readily and safely used for other purposes at end of life.

The Proposal would assist the implementation of the outcomes of the National Waste Policy by providing best practice materials recycling in an environmentally safe, scientific and sound method. Specifically, the Proposal would assist in the implementation of *Strategy 7: Increasing industry capacity* by providing waste management infrastructure that increases waste diversion from landfill and improves the quality of recycled content for reuse as high quality products. The Proposal promotes the application of circular economy principles through the implementation of a closed-loop solution to processing C&I waste, source separated paper and cardboard and mixed plastics.

The Proposal is therefore consistent with the aims and objectives of the National Waste Policy and encourages better waste management which has direct benefits for human health, the environment and the Australian and NSW economies.

3.3.3 NSW 2021: A Plan to Make NSW Number One

The NSW 2021: A Plan to Make NSW Number 1 (NSW Government, 2011) is the NSW Government's ten-year plan to guide development and economic growth within NSW. The Plan outlines five strategies to strengthen both the economic and social framework of NSW, including:

- Rebuild the economy
- Return quality services
- Renovate infrastructure
- Strengthen our local environment and communities
- Restore accountability to government.

NSW 2021 establishes 32 goals to support the implementation of this plan and ensure the delivery of measurable targets. The Plan has a focus on strategic planning and engaging the public and private sectors to provide a more innovative and economically stable NSW.

Goal 19: Invest in critical infrastructure identifies actions to increase investment into infrastructure that will both stimulate economic growth and improve productivity. The Proposal would stimulate the economy within the region by providing additional employment during both construction and operation. An increase to business competition would also be provided through additional waste disposal and reuse/distribution services which are provided to both the community and the commercial sector.

Goal 23: Increase opportunities for people to look after their own neighbourhoods and environments outlines actions to better manage the environment and includes targets to increase recycling limits in order to reduce the space required for landfill. The Proposal would assist in achieving this target by increasing waste diversion from landfill and promotes a circular economy model of waste management, turning waste into a valuable resource.

Overall, the Proposal would result in benefits to both the community, the commercial and industrial sectors and the environment. These factors are considered important to the improvement of the quality of development and stimulus of economic growth in NSW, and therefore meet the goals of the NSW 2021 State Plan.

3.3.4 Greater Sydney Region Plan: A Metropolis of Three Cities

The *Greater Sydney Regional Plan: A Metropolis of Three Cities* (Greater Sydney Commission, 2018a) is a regional planning framework that establishes the vision for the Greater Sydney region over the next 40 years. The Plan recognises the challenges the region faces with a growing population and aims to transform Greater Sydney into a metropolis of three cities with a focus on liveability, productivity and sustainability. The Plan outlines 10 directions and 40 objectives which identify areas to target in order to guide the implementation of this plan at a regional, district and local level.

Objective 35: More waste is re-used and recycled to support the development of a circular economy identifies the need for additional waste management and recycling infrastructure, including landfill and liquid waste processing capacity, noting the need for additional recycling infrastructure capacity for municipal (local council), commercial and industrial, and household hazardous waste. The objective also highlights the need to protect waste management infrastructure from encroachment of residential development.

The Proposal supports this objective as it would enhance the recycling capacity of the Greater Sydney region. The Proposal would provide a critical piece of waste management infrastructure capable of processing up to 172,000 tpa of municipal, commercial and industrial waste. In addition, the Proposal is located in an established industrial area on the site of a former resource recovery facility (the Chullora RRC) which serviced local and regional communities. Retaining this industrial land for waste management will also ensure the delivery of efficient and resilient waste management systems for Greater Sydney.

3.3.5 South District Plan

The South District Plan, prepared by the Greater Sydney Commission (2018b), is a strategy that provides a clear vision for the growth and development of the South District of Metropolitan Sydney for the next 20 years. This plan informs the implementation of the *Greater Sydney Region Plan: A Metropolis of Three Cities* at a regional level.

The Plan establishes key goals for the growth and development of the South District including 20 planning priorities and 82 actions which align with the directions and objectives outlined in the *Greater Sydney Region Plan*. The following are applicable to the Proposal:

- Planning priority S17 – Reducing carbon emissions and managing energy, water and waste efficiently
- Action 74 - Protect existing and identify new locations for waste recycling and management
- Action 75 - Support innovative solutions to reduce the volume of waste and reduce waste transport requirements.

Planning Priority S17 identifies the need to improve the efficiency and capacity of waste infrastructure within the South District due to the forecast growth in waste generation over the next 20 years. The provision of waste infrastructure within the region is essential for ensuring the availability and cost efficiency for the community.

The Proposal would represent a critical piece of waste management infrastructure in the South District and would help create a sustainable city by increasing resource recovery rates. This would assist in creating a sustainable South District by reducing the amount of waste that goes to landfill as a result of increased resource recovery rates. The Proposal would receive waste from locally generated sources which would reduce the cost to the community of waste management as waste would not be transported outside the region to be processed.

The Proposal would also fulfil the requirements of Action 74 and 75 as the Proposal site would be re-established for use a state-of-the-art waste processing facility that would promote the principles of a

circular economy through implementation of a pull through model that consists of the sorting, reprocessing and specified end uses of processed materials as an integrated, closed loop solution.

3.3.6 Canterbury-Bankstown Community Strategic Plan 2028

The *Canterbury-Bankstown Community Strategic Plan 2028* (Council, 2018) and the supporting Delivery Program 2018-2021, details the Council's commitment to providing advanced recycling and waste management facilities. The key 'Destination' applicable to the Proposal is 'Clean & Green' which outlines targets to improve the sustainability of the City, including reducing the percentage of waste to landfill and establishing recycling/reuse facilities.

The Proposal is consistent with this Plan, as it would provide additional materials recycling capacity for the City and increase the diversion of waste from landfill. The Proposal would service the local area by receiving waste from locally generated sources as well as the Greater Sydney metropolitan area. As a result, the Proposal would improve resource recovery rates within the Canterbury Bankstown LGA.

3.3.7 Connective City 2036 - Canterbury-Bankstown's Local Strategic Planning Statement (DRAFT)

Canterbury-Bankstown's local strategic planning statement, *Connective City 2036* (Council, 2019), is a strategic plan that evolves on the 'Destinations' of the Canterbury-Bankstown Community Strategic Plan 2028 and provides the planning framework for the next 20 years. *Connective City 2036* outlines 10 Directions and 10 Evolutions that will ensure that the City employs a strategic planning approach to all urban planning decisions.

Evolution 9: Sustainable and Resilient Places commits to ensuring that waste management is considered at all levels of urban planning. This includes specific initiatives to retaining existing waste infrastructure and supporting the establishment of new waste and resource recovery facilities. This would provide local jobs and promote the principles of the circular economy.

The Proposal supports the implementation of Evolution 9 as it would represent a key piece of waste infrastructure which would service the Canterbury-Bankstown LGA as well as the Greater Sydney metropolitan area. The Proposal would also implement a pull through model of waste management which focusses on maximising reprocessing of material in order to achieve a high rate of material recovery. The implementation of this closed loop solution is consistent with the principles of a circular economy which meets the *Connective City 2036* strategic planning criteria.

3.3.8 Waste Less Recycle More

The Waste Less Recycle More grant program provides funding for several initiatives including the construction of new waste and recycling infrastructure to modernise the waste sector in NSW. SUEZ was successful in receiving funding for two vital aspects of the Proposal - the fibre beneficiation plant and the plastic beneficiation plant. These processes will be integral in providing the 'pull through' model and ensuring recycled fibre and plastic can be reused in the circular economy within Australia.

The securing of this funding provides a broad justification for the need of the Proposal and an indication that the EPA considers the plastic and fibre beneficiation plants to be key infrastructure required to meet the NSW 2021 recycling targets.

3.3.9 NSW Circular Economy Policy Statement - Too Good to Waste

Too Good to Waste (NSW EPA, 2019a) is the NSW Government's discussion paper on the approach to implementing the principles of a circular economy in NSW. This paper presents an overview of the application of a circular economy to resource management including strategies for developing a Circular Economy Policy.

The Policy Statement outlines eight focus areas to support the transition to a circular economy. This included supporting innovation through investment into material processing solutions and technologies and assisting the development of facilities that produce high quality recycled materials.

As discussed in Section 3.2.5, the Proposal supports the implementation of a circular economy in NSW as it utilises innovative technologies that will increase the efficiency of resource recovery and reduces the quantities of waste going to landfill. In doing so, the Proposal would also promote a shift away from the traditional approach to resource management by utilising advanced sorting technology to produce higher quality and value products. The Proposal therefore represents critical infrastructure that will be required to facilitate the NSW Government's desire to pursue a holistic approach to resource management.

3.4 Alternatives considered

A number of alternative scenarios to achieve the Proposal's objectives were considered. These included:

- A 'do nothing' scenario
- Construction of a new facility at an alternate site
- Alternate site layout and configurations.

The alternatives reviewed against the Proposal objectives are discussed below.

3.4.1 'Do nothing' scenario

Section 3.2 clearly identifies the strategic need for the provision of a resource recovery facility within the Canterbury-Bankstown LGA in order to enhance the recycling capacity within the Greater Sydney area. The strategic planning policies outlined in Section 3.3 highlight the growing concern of governments at the national, state and local level to enhance the capacity and improve the efficiency of waste management systems and reduce pressure on the limited capacity of landfills in NSW.

A 'do nothing' option would not provide the critically needed increase in MRF capacity within the Greater Sydney region. This would be inconsistent with the objectives and goals mandated in these strategic planning frameworks.

Similarly, a 'do nothing' scenario would mean that waste generated in the local community would be transported at greater distances to facilities in the Greater Sydney region. This would not only place an increased cost burden on the Canterbury-Bankstown community for waste management, it would also increase the pressure on the capacity of existing resource recovery facilities. Furthermore, it would not provide temporary and long-term employment opportunities within the region.

As such, the 'do nothing' option is not considered to be a feasible alternative to the Proposal.

3.4.2 Alternative site

The Proposal site currently has approval for resource recovery activities to be carried out within a MRF. The Proposal site is situated in close proximity to key regional transport infrastructure and is of appropriate zoning for an industrial use. Further, the Proposal would be supported by the existing SUEZ infrastructure, including the existing site office already established on the site. The Proposal site is therefore considered the optimal location for the Proposal.

An alternative to the Proposal could be the refurbishing the existing Spring Farm MRF which is an aging asset. The location of the Proposal is better placed geographically to service central Sydney customers and would yield the benefit of previously operating as a waste management facility.

Based on the above factors, construction and operation of the Proposal at the chosen site is considered the most suitable option.

3.4.3 Alternate site configuration and layout

The design of the Proposal has considered a broad range of factors to ensure that the configuration and layout has been optimised. The Proposal site was constrained by a number of factors (such as the Cooks River stormwater canal) and a number of design layouts were assessed to attempt to account for all constraints. The layout of the Proposal is considered the most effective and appropriate design to achieve the objectives set out in Section 1.3.

Design options considered at the commencement of the assessment for the Proposal are outlined in Table 3-4.

Table 3-4 Alternative site configurations

Feature	Alternatives	Justification
MRF layout	• Single open structure, similar to the previous Chullora RRC MRF • Separated layout with three distinct areas, separating the receival and product storage areas **(selected)**	The previous Chullora MRF was subject to a fire, which may have been worsened by the open design of the facility. Consequently, the design process for the Proposal aimed to minimise fire risk. Separation of the MRF into three distinct sections with fire resistant walls would minimise fire risk. This layout separates the stockpiles of waste and the output products into two areas at opposite ends of the MRF, minimising the volume of combustible material in any one location.
Provision of truck holding space to the north of the MRF	• No allowance for truck holding space • Provision of truck holding space, requiring augmentation to product storage area to allow safe movement of vehicles around the entire perimeter of the MRF **(selected)**	Although the provision of a truck holding space alongside the northern edge of the MRF required the corners of the MRF to be cornered off (confirmed via swept-path analysis) the benefits of providing this include that it: • Minimises redundant space across the Proposal site • Provides a truck holding location for the unlikely circumstance that both truck load-out areas adjacent to the product storage area are occupied and a third collection vehicle arrives onsite; preventing delays within the queueing lanes • Provides greater operational flexibility, allowing vehicles the ability to safely circumvent the entire MRF building if required.
Load out of product into collection vehicles	• Via curtain-siders outside the product storage area **(selected)** • Via top-loading into vehicles that would be elevated at a lower level via ramps	Original designs considered the use of ramps in the product storage area to allow trucks to be loaded from the top. However, this option was discarded as the ramp slopes were considered suboptimal, and the inclusion of ramps would provide an additional traffic hazard within the Proposal site.
Workshop and site office locations	• Located wholly within the MRF within the receival area **(selected)** • Located wholly within the MRF within the processing area • Located outside the MRF	Early iterations of the Proposal design located the maintenance workshop as a standalone building in the southern corner of the Proposal site. This option was discarded as it created additional traffic hazard for vehicles when reversing into the receival area at the southern end of the MRF. The location of the maintenance workshop and internal MRF site office changed multiple times throughout the design refinement process. The final location was adopted as it allowed an optimal

Feature	Alternatives	Justification
		internal design, minimising redundant space. Further, it allowed direct pedestrian access (via a pedestrian overbridge) from the staff facilities within the MRF to the car park.

Conclusion

The Proposal represents critical infrastructure that will be required to respond to the export ban on unrefined recycling streams, enhance circular economy outcomes and build the resilience of the local recycling sector. The development of the Proposal would satisfy the growing demand for MRFs in the MLA and meet the long-term strategic goals and priorities of Council, the NSW Government and Commonwealth Government.

Consideration was given to a number of alternatives as part of the approach and design development for the Proposal. These included a 'do nothing' scenario, alternative sites, and alternative site configurations. Each of these alternatives have been discarded as they would not adequately address the Proposal's objectives or address the critical need for the Proposal.

4 PROPOSAL DESCRIPTION

Summary

The Proposal is to develop and operate a MRF at 21 Muir Road, Chullora to process co-mingled recyclable MSW and dry C&I waste; with a material processing capacity of up to 172,000 tpa. The Proposal site covers a 2.5 ha developable area within the Chullora RRP site.

Vehicle access to the site would utilise the existing access points: the primary access and egress from the north via Muir Road, and the secondary access from the south for light vehicles only via Anzac Street. The key built form elements of the Proposal include:

- The MRF
- The existing site office and car parking area
- Existing vehicle access points from Muir Road and Anzac Street
- Urban design features and signage
- Fire management infrastructure
- Stormwater and flood detention infrastructure (existing and additional)
- Ancillary facilities and structures.

Construction of the Proposal is anticipated to commence in early 2021 and be undertaken over approximately 12 months, comprising three key stages:

- Stage 1: Establishment of a hardstand area and internal road network
- Stage 2: Construction of the MRF and installation of fixed plant and equipment
- Stage 3: Installation of ancillary facilities, commissioning, and demobilisation

Construction would require up to 30 personnel and would be carried out within standard construction hours.

Once operational, the Proposal would operate 24 hours, 7 days per week. The Proposal would employ approximately 45 FTE employees. The process of recovering waste combines automated mechanical separation with manual sorting processes. The key operational components of the Proposal would include:

- Receival of kerbside co-mingled recyclables from municipal and C&I sources within an enclosed tipping area, with manual and mechanical removal of hazardous or problematic items such as batteries
- Recovery of non-putrescible recyclables items including rigid plastic containers, ferrous and non-ferrous metals, for export from the site
- Beneficiation (value-add processing) of fibres and plastics for export from the site.

The processing capacity of the MRF would be sufficient to adequately process the proposed throughput, allowing surplus processing time and contingency to account for any stoppages or unscheduled maintenance needs. Non-conforming waste management and contingency measures would be employed to ensure continuous operations. Ancillary infrastructure would support the operation of the Proposal.

4.1 Introduction

This section provides an indicative and conceptual description of the Proposal. The SEARs relating to the Proposal description, and a summary of where they have been addressed, is presented in Table 4-1.

Table 4-1 SEARS (Proposal description)

SEARs	Where addressed
General Requirements	
The EIS must include a: • Detailed description of the development, including:	Chapter 4
– Likely staging of the development- including construction, and operational stage/s	Section 4.2 Section 4.4.1 (construction)
– Plans of any proposed buildings works	Section 4.3 Appendix E Concept Plan and Architectural Designs
• The EIS must also be accompanied by a report from a qualified quantity surveyor providing: – a close estimate of the jobs that will be created by the development during the construction and operational phases of the development	Section 3.2.6 Section 4.4.2 and Section 4.5.9
Suitability of the site	
• A detailed justification that the site can accommodate the proposed resource recovery facility and its environmental impacts and relevant mitigation measures	Section 4.5.10 Section 24.2.3
Waste Management – including:	
• a description of the waste streams that would be accepted at the site including the maximum daily, weekly and annual throughputs	Section 4.5.1 (waste streams) Section 4.5.10 (daily, week and annual throughputs)
• A detailed description of waste processing operations (including flow diagrams for each waste stream) including a description of the technology to be installed, resource outputs, and the quality control measures that would be implemented	Section 4.5.3 (waste processing operations) Section 4.5.2 (technology and equipment) Section 4.5.3 and Section 4.5.5 (quality control measures)
• details of how waste would be stored (including the maximum daily waste storage capacity of the site) and handled on site, and transported to and from the site, including details of how the receipt of non-conforming waste would be dealt with	Section 4.5.4 (waste stockpiles and storage) Section 4.5.6 (transportation) Section 4.5.5 (non-conforming waste)
• Details of the waste tracking system for incoming and outgoing waste	Section 4.5.7
Traffic and transport, including:	
• Details of all traffic types and volumes likely to be generated during construction and operation, including a description of haul routes. Traffic flows are to be shown diagrammatically to a level of detail sufficient for easy interpretation.	Section 4.4.4 (construction) Section 4.5.6 (operation) Chapter 7 Appendix J TIA

SEARs	Where addressed
• Detailed plans of the proposed layout of the internal road, weighbridge locations, pedestrian network and parking on site in accordance with the relevant Australian Standards and Council's DCP	Section 4.2 (layout) Section 4.3.2 (parking) Chapter 7 Appendix J TIA
Air quality and odour - including	
• the details of buildings and air handling systems and strong justification for any material handling, processing or stockpiling external to a building	Section 4.3.1 and Section 4.5.8 Section 8.5
Fire and incident management – including:	
• Identification of the aggregate quantities of combustible waste products to be stockpiled at any one time	Section 4.5.4 Appendix G Fire Safety Strategy Appendix H Fire Systems Design
• Technical information on the environmental protection equipment to be installed on the premises such as air, water and noise controls, spill clean-up equipment and fire (including management of fire water, location of fire hydrants and water flow rates at the hydrant) management and containment measures	Section 4.3.5 (fire systems) Chapter 12 (protection equipment) Appendix G Fire Safety Strategy Appendix H Fire Systems Design
• Detailed information relating to the proposed structures addressing relevant levels of compliance with Volume 1 of the National Construction Code (NCC)	Appendix E Concept Plan and Architectural Designs Appendix F BCA Assessment Report
• details of how Clauses E.10 and E2.3 of Volume One of the NCC would be addressed	Appendix E Concept Plan and Architectural Designs Appendix F BCA Assessment Report

Further to the above, the EPA, TfNSW and Council require further details on specific requirements relating to their authority. These requirements are discussed throughout this EIS and are provided in Table 4-2.

Table 4-2 Other agency requirements and relevant report sections (Proposal description)

Aspect	Where addressed
EPA	
• Waste management including details of waste to be received at the Premises	Section 4.5.1 (waste streams) Section 4.5.3 (processing)
• Types and quantities of each type of waste to be received and a description of processing procedures for each waste type	Section 4.5.1 (waste streams) Section 4.5.3 (processing) Section 4.5.10 (daily, week and annual throughputs)
• Maximum amount of waste to be stored on the Premises at any one time	Section 4.5.4
• Maximum annual throughput of waste to be processed at the Premises	Section 4.5.10

Aspect	Where addressed
• A description of how the Proponent will meet the EPA's record keeping and reporting requirements including weighing material in and out of the Premises.	Section 4.5.7
• Water management including fire water management	Section 4.3.6 (water management) Section 4.3.5 (fire systems) Chapter 9
TfNSW	
• Details of the proposed accesses and the parking provisions associated with the proposed development including compliance with the requirements of the relevant Australian Standards (i.e. turn paths, sight distance requirements, aisle widths, etc.).	Section 4.2 (layout) Section 4.3.2 (parking) Section 4.3.3 (vehicle access) Chapter 7 Appendix J TIA
• Proposed number of car parking spaces and compliance with the appropriate parking codes.	Section 4.3.2 Chapter 7 Appendix J TIA
• Detail of service vehicle movements (including vehicle type and likely arrival and departure times).	Section 4.4.4 (construction) Section 4.5.6 (operation) Chapter 7 Appendix J TIA
Council	
The internal circulation, operation of the site, access to weigh bridges, proposed and existing, needs to be defined	Section 2.6 (existing site features) Section 4.3 and 4.5 (proposed operational features) Section 7.5.6 (internal circulation)
Due to the nature of the Proposal, it is requested that fire safety management measures form part of the future EIS. A detailed fire report by a suitably qualified consultant is recommended to demonstrate that the relevant fire safety requirements are implemented during the design and ongoing management of the facility, including information on emergency evacuation and types of building materials to be used and the fire resistance of these materials.	Section 4.3.5 (fire safety management infrastructure) Section 12.6 (fire safety management) Appendix G (Fire Safety Strategy) Appendix H (Fire Systems Design)

4.2 Proposal overview

The Proposal would comprise the construction and operation of a MRF with a material handling capacity of up to 172,000 tpa, comprising:

- Up to 115,000 tpa of co-mingled recyclables collected from municipal and C&I sources
- Up to 50,000 tpa of source separated paper and cardboard for baling
- Up to 7,000 tpa of external mixed plastics for secondary processing.

Once operational the Proposal would receive waste from locally generated sources as well as the greater Sydney area. The total input in any year would not exceed 172,000 tpa, with the exact throughput from each source varying subject to the market conditions in that year and different Councils' recycling collection regimes.

The Proposal would represent a critical piece of waste management infrastructure which would mitigate significant capacity constraints currently impacting the Sydney region (refer Section 3.2.1). The Proposal would provide advanced recycling processes to build resilience within the current network of recycling facilities as well as promote the principles of a circular economy through implementation of a pull-through model that conceives of the sorting, reprocessing and specified end uses of processed materials as an integrated, closed loop solution.

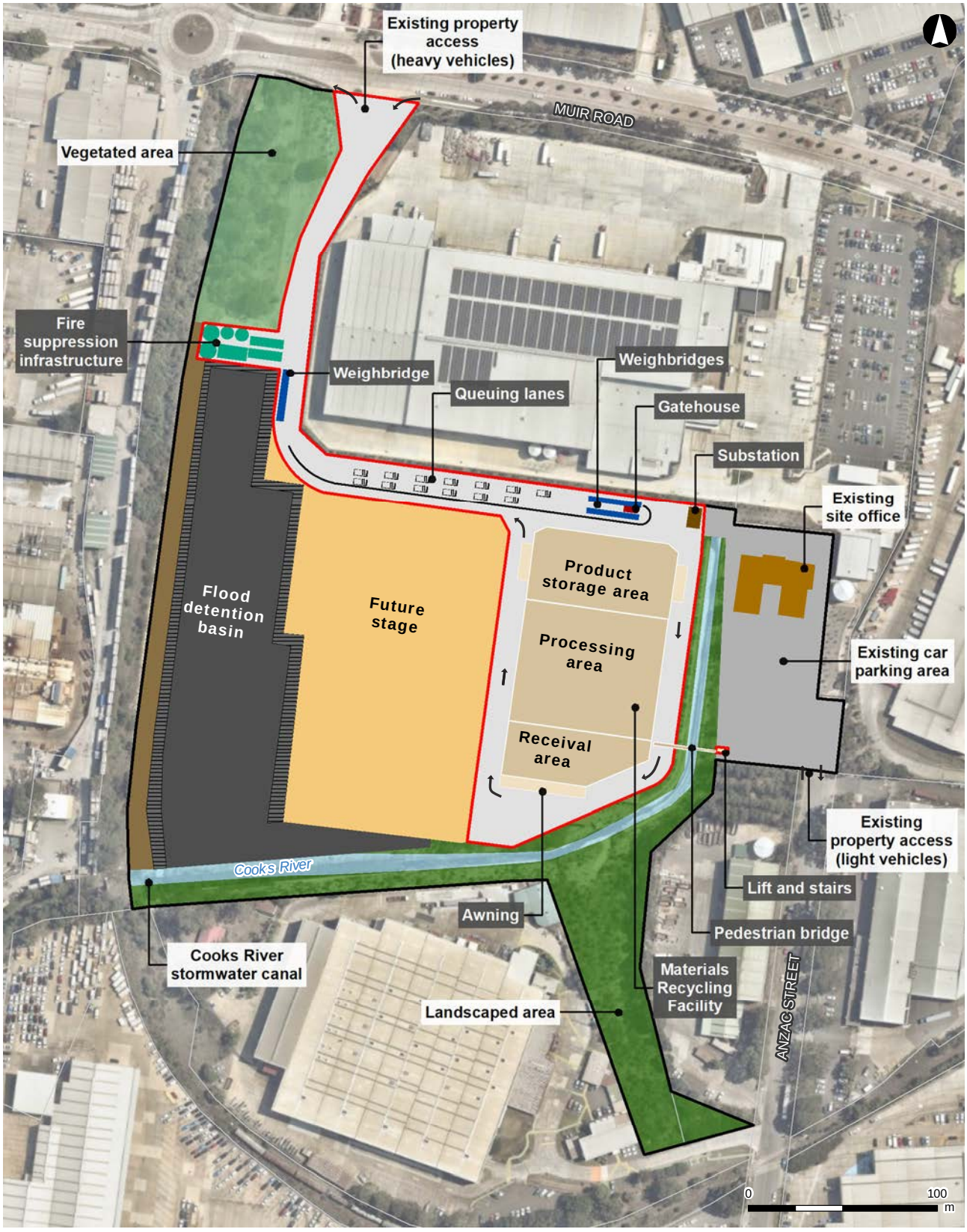
The key construction components of the Proposal would include:

- Establishment of a hardstand area and internal road network
- Construction of the enclosed MRF shed
- Installation and commissioning of fixed plant and equipment
- Installation of ancillary infrastructure, including weighbridges, gatehouse, pedestrian overbridge, and fire systems
- Installation and connection of site service infrastructure (electrical, water, sewer, gas and telecommunication services)
- Installation of signage.

The key operational components of the Proposal would include:

- Operation of a MRF 24 hours per day, seven days per week (including processing and waste delivery and collection)
- Product storage.

The key components of the Proposal are shown in Figure 4-1.



LEGEND

- Chullora RRP site boundary
- Proposal site
- Future stage
- Established earthworks
- Batter
- Flood detention basin
- Property boundary

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Coordinate System: GDA 1994 MGA Zone 56
Date issued: August 4, 2020
Aerial imagery source: nearmap Jan 2020

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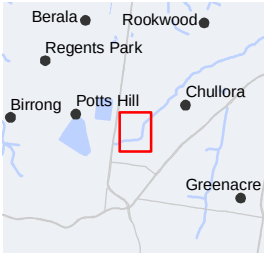


Figure 4-1: The Proposal

4.3 Built form

As described in Section 2.6 the Chullora RRP site comprises the following elements:

- The Proposal site – comprising a 2.5 ha developable area for the construction and operation of the MRF and internal roads and supporting infrastructure
- The existing site office and car parking area - comprising the 0.7 ha eastern portion of the Proposal site
- A flood detention basin and stormwater infrastructure – comprising the 1.7 ha area in the western portion of the Chullora RRP site
- The future development area – comprising the 1.8 ha central portion of the Chullora RRP site
- The Cooks River stormwater canal
- A 1.2 ha landscaping area comprising the southern portion of the Chullora RRP site
- A 0.44 ha vegetated area in the north-western corner of the Chullora RRP site.

The Proposal would be support by ancillary infrastructure across the broader Chullora RRP. The built form of the key components of the Proposal, as well as relevant existing infrastructure that would support the operation of the Proposal, is described below.

4.3.1 MRF

The Proposal would include the construction of a shed for the purpose of the MRF. The MRF would have a total footprint of approximately 9,986 m^2 and a height of approximately 12.3 m.

The processing shed would be split into three main areas. Each main area would comprise a steel frame column shed with Colorbond frame and cladding, and a Colorbond sheeting angled roof. The three main areas are shown on Figure 4-2 and described below.

Receival area

The southern portion of the MRF would comprise an approximately 1,950 m^2 receival area. The product receival area would comprise a steel frame column shed with Colorbond frame and cladding, approximately eight m in wall height, with a Colorbond sheeting roof pitched to maximum height of approximately 9.9 m.

The southern wall of the receival area would include four doors for waste drop-off vehicles to reverse into to deposit waste into the receival area. Each door would be 5 x 8 m and would be equipped with high speed roller shutters. Each of the four doors could be accessed by reversing medium rigid vehicles (MRVs). The two eastern doors could also be accessed by walking-floor trailer rigid vehicles (refer Section 4.5.6 for a description of vehicle types that would service the Proposal). The outer exterior of the receival area would be covered by an eight m high steel framed and cladded awning.

The receival area would be generally split into three tip floor areas. In between each area would be conveyors installed at ground level over inground pits. The inground pits would provide approximately 1.1 ML of storage for any fire water generated by the sprinkler and deluge systems in the event of a fire (refer Section 4.3.5). Operational personnel would deposit waste directly from the tip floors onto the conveyors via a front-end loader.

The combined capacity of the bays would equate to a total waste storage capacity of 4,150 m^3 with waste stockpiled to a height of up to a maximum of four m.

In summary the receival area would:

- Allow up to four trucks to deposit waste simultaneously (four access doors)
- Provide sufficient room for manoeuvring of the front-end loader to feed deposited waste onto the conveyor systems
- Prevent trucks from queuing in front of the building

- Provide a dedicated area for commercial cardboard truck discharge.

A designated 100 m^2 workshop area would be located in the eastern end of the receival area. This area would contain tools and equipment for the purpose of repairing and maintaining trucks and plant and equipment utilised in the MRF.

A small internal administrative area (containing a kitchen, change room, control room, viewing room and meeting rooms) would be provided to the east of the workshop area the eastern portion of the receival area comprising a lower level and a mezzanine floor. An exit directly from the upper level administrative area would connect to the pedestrian walkway which connects the MRF to the car parking area over the Cooks River stormwater canal.

Processing area

The central portion of the processing shed would comprise a 4,955 m^2 processing area. The majority of the processing area would be occupied by the waste processing plant and equipment. Plant and equipment would largely comprise fixed plant.

The processing area would comprise a steel frame column shed with Colorbond frame and cladding, approximately 9.3 m in wall height, with a Colorbond sheeting roof pitched to maximum height of approximately 12.1 m.

Fixed plant and equipment is described in detail in Section 4.5.2 and would likely include:

- Two chain conveyors with one drum feeder each
- An air-conditioned sorting cabin
- Various screens to sort the various waste products
- Two over band magnets
- A wind sifter
- Optical sorters
- An eddy current separator
- A storage system and baling line
- Balers
- Bagging system.

The processing area would contain a series of elevated walkway platforms to provide access for personnel in and around plant and equipment without needing to interact with heavy machinery on the processing area floor.

External access to the processing area would be available via two 6 x 8 m high speed roller shutter doors on each side of the shed. These doors would predominantly remain closed. A 5 x 3 m roller shutter door would be located at the northern end of the processing area for connection into the product storage area. A further two 5 x 5 m and one 2.4 x 4 m roller shutters would be located at the southern end for connection to the receival area.

A series of emergency exit doors would be located along all four walls of the processing area for use by staff in the event of an emergency.

Product storage area

The northern portion of the MRF would provide a 2,980 m^2 area for the storage of product. The area would be separated into multiple storage bays as follows:

- A dedicated glass storage bay in the south-western corner of the product storage area. Glass could be stockpiled to a height of five metres. Concrete push walls, five m in height would extend from the southern wall in the product storage area
- A dedicated residual waste bay in the north-western corner of the product storage area. The bay would have push walls on three sides, each four m in height
- Three more storage bays would be located to the west of the glass storage area for the storage of bailed material. Bailed material could be stored up with up to four bails on top of each other (to a height of four metres)
- Four large storage bays (18.25 x 12 m) would be located along the northern wall on the product storage area, separated by four m high push walls. The bays would be utilised for stacking of bailed material, with up to four bails stacked on top of each other (to a height of four m).

The MRF would produce up to 12 difference commodities (refer Section 4.5.1). The proportion of each commodity would be dependent on the composition of the inbound material and would vary from time to time. With the exception of the glass storage bay and residual waste area, each storage area could be utilised for each of the output commodities. Due to the bailed nature of the material multiple commodities could be stored in a single bay if required. Section 4.5.4 provide a summary of the proposed storage quantities of product material.

In the north-eastern corner of the storage area would be a small electrical room. This room would only be able to be accessed from the exterior of the MRF. Adjacent to the electrical room, within the product storage area, would be two above ground rainwater tanks with a combined 50 kL storage capacity.

The product storage area would have two high speed roller shutter doors 6 x 8 m wide on the eastern (entry) and two roller shutter doors 6 x 8 m wide on the western (exit) side of the shed. Awnings six m in height would be located extending from the eastern and western side of the product storage area to provide cover for the loading of product collection vehicles adjacent to the roller shutter doors.

The product storage area would comprise a steel frame column shed with Colorbond frame and cladding, approximately seven m in wall height, with a Colorbond sheeting roof pitched to maximum height of approximately 9.9 m.



LEGEND

- Chullora RRP site boundary
- Proposal site
- Future stage
- Existing car parking area
- Conveyor
- Grate
- Hardstand
- Inground fire storage
- Mezzanine floor
- Pedestrian bridge
- Push wall
- Shutter
- Walkway

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Figure 4-2: MRF layout

4.3.2 Existing site office and car parking area

The eastern portion of the Chullora RRP site currently comprises a site office and existing light vehicle parking area. The existing site office is characterised by a single storey site administration building and associated parking area connected to an access off Anzac Road. The car parking area includes 70 onsite car parking spaces; 10 adjacent to the administration building and 60 spaces in a larger parking area approximately 20 m to the south of the building (Figure 4-3). Patches of planted vegetation are located along the boundary of the administration building and along internal walkways within the eastern portion of the Proposal site.

Pedestrian access from the site office to the greater Proposal site is provided by a walkway and bridge over the Cooks River stormwater canal in the north-eastern corner of the Proposal site. A secondary pedestrian walkway would be installed as part of the Proposal. The walkway would connect the mezzanine floor of the internal site office within the receival area of the MRF directly to the south-western corner of the existing car park. A lift and stairs would be installed to provide access to the walkway from the car park. The walkway would traverse the Cooks River stormwater canal, and its easement, in its entirety with no piers proposed to be installed within or adjacent to the canal.

The existing site access would be formalised as part of the Proposal. This would comprise:

- Removal of the sandstone boulders (refer Figure 4-3)
- Installation of a gate to prevent unauthorised access
- Installation of signage to show ownership and demarcate the site entrance and ownership (refer Section 4.3.4)

A bicycle rack, with capacity for up to ten bicycles, would be installed in the parking area.

No other changes are proposed to the existing car park and site office. A parking needs analysis is presented in Section 7.5.5 of this EIS.

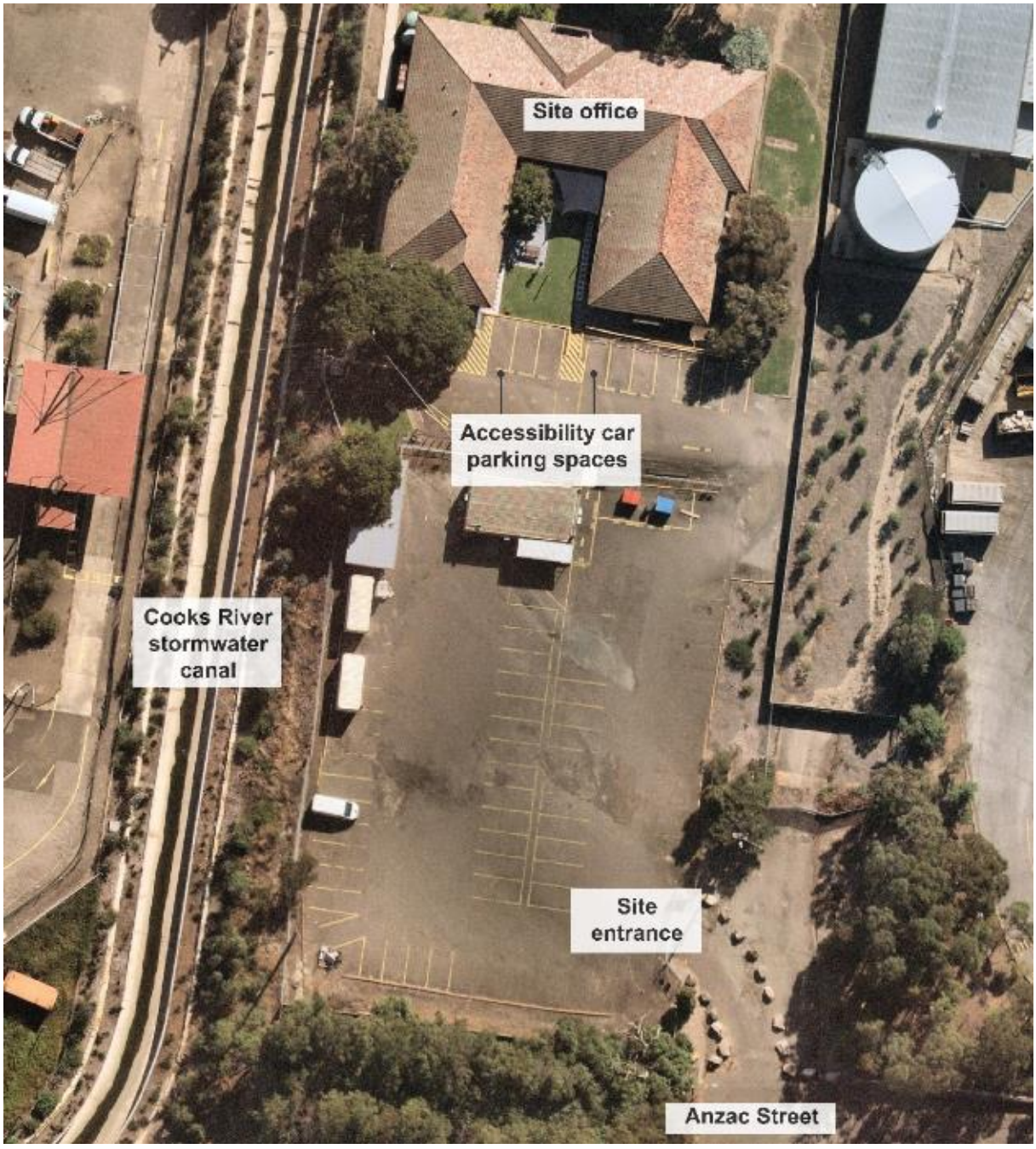


Figure 4-3 Existing car park

4.3.3 Existing vehicle access

The Proposal site currently has two vehicular access points. The access point for heavy vehicles is via Muir Road, west of the roundabout at Dasea Street (refer Figure 4-4). Minor works would be carried out at the Muir Road entrance comprising:

- Installation of a pedestrian refuge area between the ingress and egress driveway (within the Proposal boundary) to facilitate pedestrian walking movements across the wide access driveway. The pedestrian refuge would be provided within the existing grass refuge area.
- Installation of 'no parking' signage adjacent to the driveway access.

A secondary access point for staff (light vehicles only) is provided from Anzac Street. Formalisation of the site entrance is proposed as part of the Proposal, comprising:

- Removal of the sandstone blocks currently demarcating the site access
- Installation of signage and fencing at the site entrance.

The Proposal site would utilise these existing access points. Primary heavy vehicle access to the Proposal site from the north would remain via Muir Road from both directions, and egress is via left turn only onto Muir Road.

The Proposal site would be accessed by typical waste collection vehicles comprising both medium and heavy rigid vehicles and B-doubles (refer to Section 4.5.6). The maximum vehicle size that would access the Proposal site would therefore be a B-double 25 m in length.

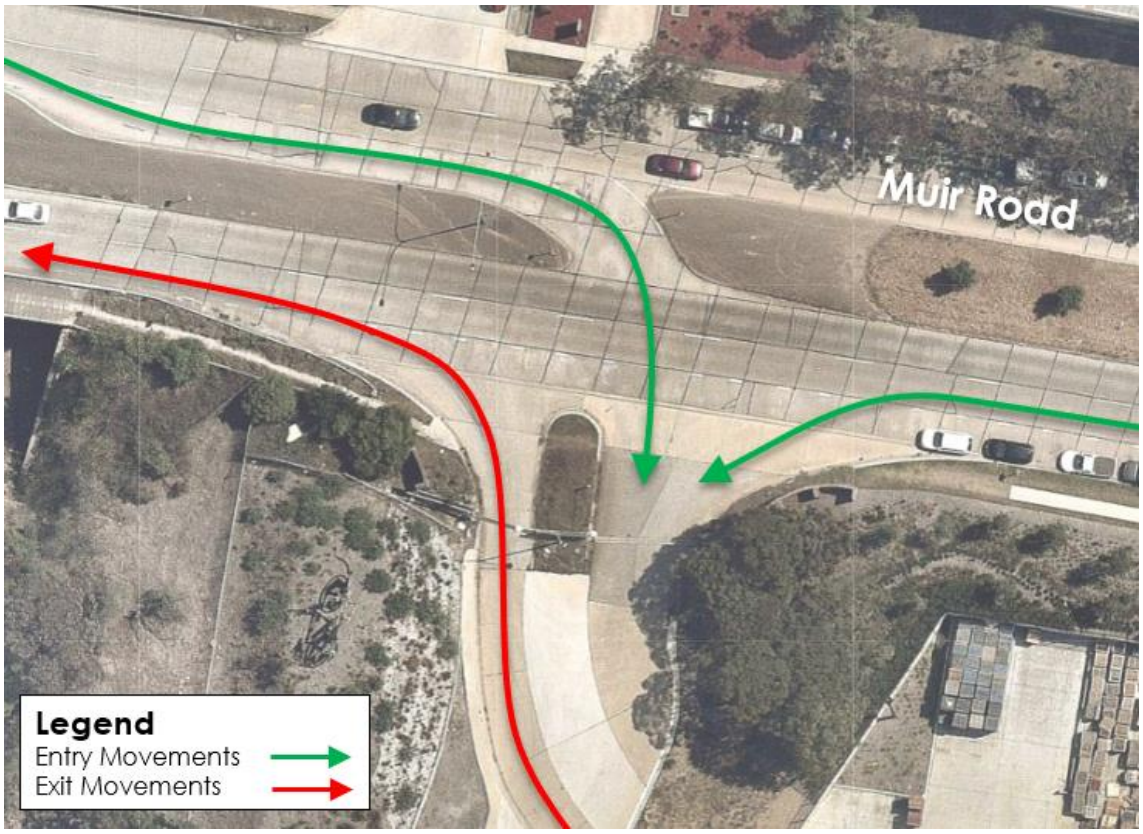


Figure 4-4 Heavy vehicle turning movements at Proposal site access

4.3.4 Urban design and signage

The existing Chullora RRP site comprises an extensive landscaping area in the southern portion of the site (refer Figure 2-5). The vegetation along the Cooks River stormwater canal and across the landscaping area consists of both native and exotic plantings. These areas, as well as the vegetated area in the north-western portion of the Chullora RRC would be retained to provide a visual buffer into the Proposal site.

The building materials, colours and finishes would be designed to be consistent with the current landscaping design and with surrounding land uses. The exterior of the MRF shed would comprise a navy blue and grey Colorbond cladding with painted charcoal concrete tilt up walls. The roof and awnings would comprise grey Colorbond cladding. Due to the position of the PFD Storage Warehouse, the Proposal would be mostly obscured from Muir Road. An indicative drawing of all finishes and materials is shown in Appendix E.

A detailed assessment of the architectural design of the MRF against the provisions of the National Construction Code Series (Volume 1) Building Code of Australia 2019 (BCA) has been undertaken and is provided in Appendix F.

'SUEZ' signage would be installed at the two site entrances and on the eastern and northern sides of the MRF shed, and would comprise the following:

- Muir Road and Anzac Street site entrances – approximately 4 x 2.4 m on a wooden panelled background
- Eastern pedestrian entrance to MRF – approximately 3.5 x 2 m on a white background
- Northern side of MRF – approximately 3 x 10 m on a white background.

Indicative designs of this signage are shown in Appendix E. Conceptual artistic impressions of the MRF is shown in Figure 4-5 and Figure 4-6.



Figure 4-5 Artistic impression of the MRF – southern perspective



Figure 4-6 Artistic impression of the MRF – northern perspective

4.3.5 Fire management infrastructure

A Fire Safety Strategy and a Fire Systems Design has been prepared for the Proposal and are provided in Appendix G and Appendix H respectively. The Proposal includes a robust fire systems design, prepared in consultation with Fire and Rescue NSW (FRNSW) and in accordance with the FRNSW (2020) *Fire safety guidelines: Fire safety in waste facilities* and FRNSW (2019) *Fire safety guidelines: Access for Fire Brigade Vehicles and firefighters.* A detailed description of the Proposal's compliance with these guidelines is provided in Appendix H. Figure 4-7 shows the key fire systems across the Chullora RRP site.

MRF fire management

As described above, the MRF would be divided into three main areas: the receival area, processing area and product storage area. This layout has been specifically adopted to minimise fire risk, by separating waste and product stockpile areas to the greatest extent possible (i.e. the receival hall is separated from the product storage area to separate stockpiles). Fire systems within the MRF would include:

- The walls between each area within the MRF would be have a fire resistance level (FRL) of 90 / 90 / 90; meaning that the walls would be fire resistance for a minimum period of 90 mixtures for structure adequacy, integrity and insulation
- Deluge systems would be installed at any opening in the internal walls (e.g. where conveyors extend through the wall between the receival area and the processing area)
- A fire detection system comprising of thermal cameras and smoke detection would be installed across the MRF. A trip system would automatically shut down all fixed plant and equipment, including conveyors, once a fire is detected
- A fully automated sprinkler system designed in accordance with Australian Standard (AS) *2118.1-2017 Auto Fire Sprinkler Systems (AS 2118.1)*
- Smoke detection system designed in accordance with *AS 1670.1-2018 Fire detection, warning, control, and intercom systems (AS 1670.1)*
- Building occupant warning systems, including visual light alerts, designed in accordance to *AS1670.1*
- Fire hydrant system designed in accordance to *AS 2419.1-2005 Fire hydrant installations (AS 2419.1)*
- Hose reels installed along path of travel designed in accordance with *AS 2441-2005 Installation of fire hose reels (AS 2441)*
- Extinguishers installed in accordance with *AS 2444-2001 Portable fire extinguishers and fire blankets (AS 2444)*
- Emergency lights and exit signs designed in accordance *AS 2293.1-2018 Emergency lighting and exit signs for building in Australia (AS 2293)*
- A smoke hazard management system designed in accordance *AS 1668.1-2015 The use of ventilation and air conditioning in buildings fire and smoke control in buildings (AS 1668.1)*
- Fire hydrant and a sprinkler ring main would be installed around the perimeter of the MRF

Two inground pits / interceptors would be provided in the receival area to capture any water generated by the sprinkler and deluge system in the event of a fire. In order to assist with the containment fire water runoff, provision of an automated shut off valve would be provided upstream of the discharge to the Upper Cook River drainage channel. The shut off valve would comprise a keystone or knife-gate valve with an electric actuator which would be triggered by the fire alarm.

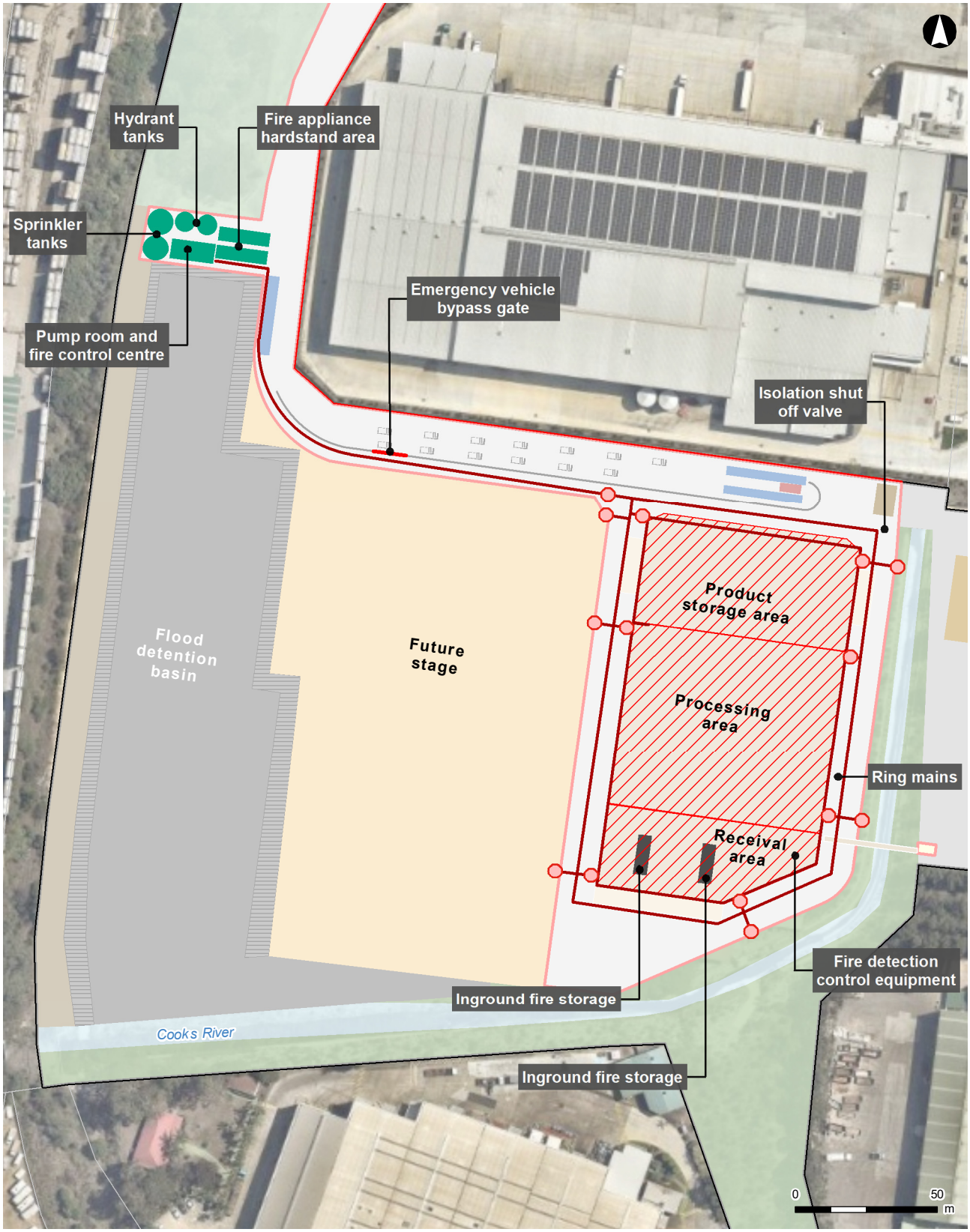
Water captured within these pits would be pumped and disposed of offsite. The two pits and the inceptor pit would have a total capacity of 1.536 million litres; sized to capture the maximum capacity of the sprinkler and hydrants tanks.

Broader Chullora RRP fire systems

The fire systems within the MRF would be supported by broader fire systems infrastructure across the Chullora RRP, comprising:

- Two hydrant tanks (432,000 L total) and two sprinkler tanks (1,104,000 L total)
- Fire hydrant and sprinkler boosters
- Fire control centre and pump room
- Fire appliance hardstand and manoeuvring area
- Emergency exit points
- Connection to the existing Sydney Water towns main, with in ground stop valve to ensure supply to tanks
- External fire hydrants
- External fire hose reels

- Direct access to the MRF for the fire brigade via an emergency vehicles bypass gate (allowing emergency vehicles to access the MRF without having to cross the inbound weighbridges).



LEGEND

- Chullora RRP site boundary
- Proposal site
- Future stage
- Batter
- Flood detention basin
- Property boundary
- Dual external fire hydrant
- Emergency vehicle bypass gate
- Ring main
- High hazard sprinkler protection
- Inground fire storage

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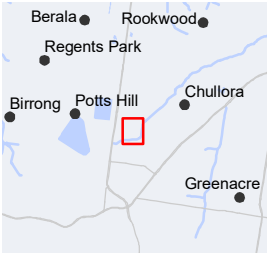


Figure 4-7: Fire systems elements

4.3.6 Water use management infrastructure

The Proposal would have water demand for the use of the following elements:

- Internal potable water (e.g. employee showers and inside tap use)
- Internal non-potable (e.g. toilet flushing)
- Dust suppression (e.g. misting)
- Fire services (e.g. sprinklers and fire service tanks).

A rainwater harvesting system would be installed as part of the Proposal to capture roof rainwater runoff from the MRF and provide a non-potable water supply. The rainwater harvesting system would comprise:

- Two above ground 25 kL rainwater tanks for the collection and storage of rainwater. Rainwater from these tanks would be pumped for distribution throughout the MRF and broader Chullora RRP in a dedicated non-potable water reticulation system to toilets and external irrigation areas. The rainwater tanks would be located within the product storage area of the MRF (refer Figure 4-2)
- Mains top up to Sydney Water system for prolonged periods of dry weather
- First flush diverter and filters to ensure adequate quality of reuse water
- Tank material would be steel or polymer and appropriately located to minimise visual impact.

The inground stormwater drainage system would be sized to cater for overflow from the rainwater tanks in times when the tank storage is full. This would allow water to continue to be discharged into the stormwater drainage system. Connection to the Sydney Water main supply would be installed for water supply demands that cannot be met by the rainwater tanks.

Appendix L and Chapter 9 provide further detail on the water use management infrastructure across the Chullora RRP site.

4.3.7 Stormwater, water quality and flood detention infrastructure

As noted in Section 4.3.5 Chullora RRP site will comprise flood mitigation and stormwater infrastructure following completion of flood mitigation works (DA 366/2020) anticipated to be completed in late 2020. This infrastructure would support the operation of the Proposal by providing flood immunity to the Proposal site above the 1-in-100 year rainfall event and through the provision of stormwater infrastructure. The existing infrastructure across the Chullora RRP site that would support the operation of the Proposal comprises (refer Figure 4-8):

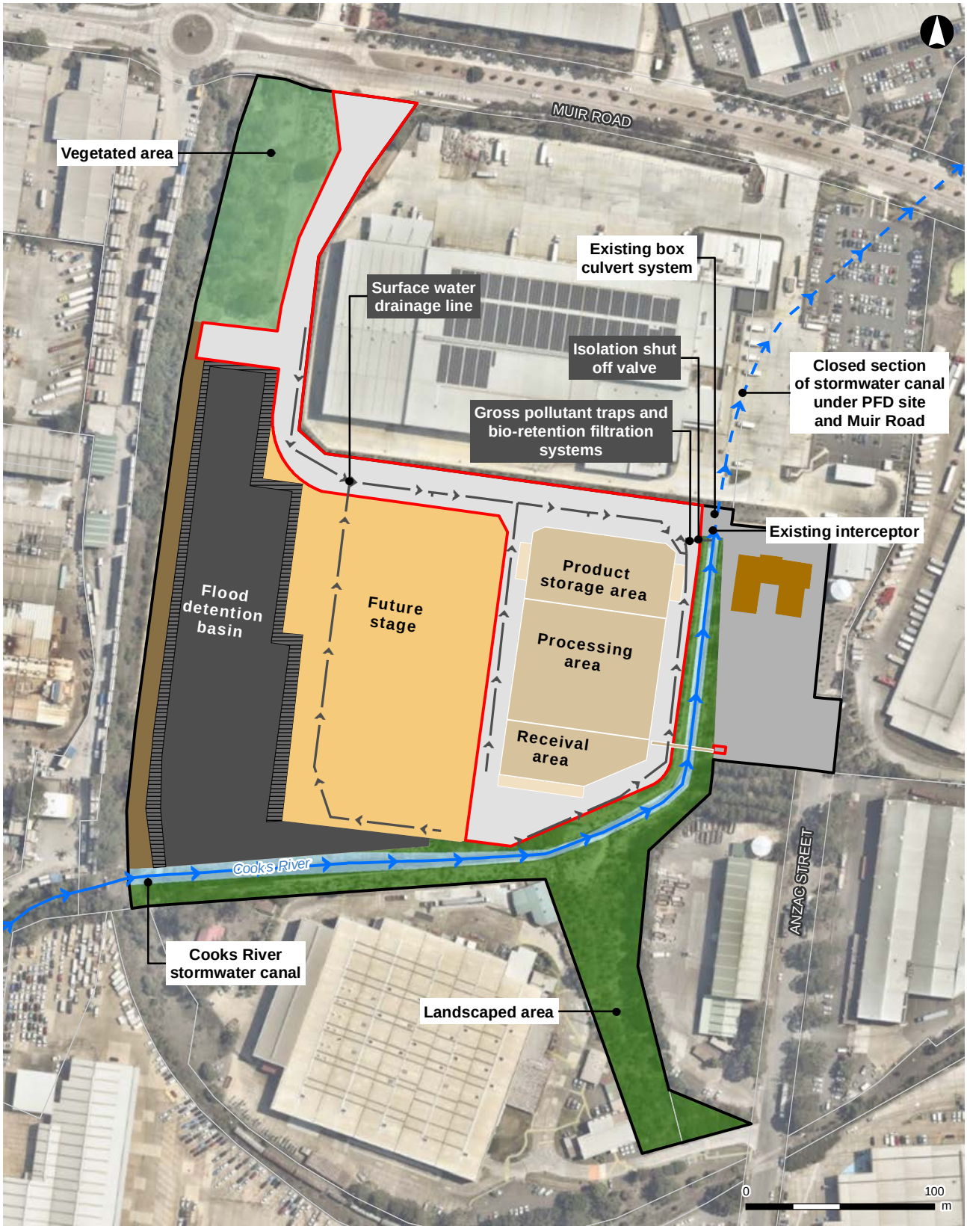
- A flood detention basin, with:
  - A total volume of 22,100 m^3
  - Base dimensions of 15 m by 30 m
  - Top dimensions of 24 m by 39 m
  - Maximum batter slops of 1V:3H
  - A depth of 1.5 m.
- Cooks River stormwater canal and drainage system. The existing discharge to the Upper Cooks River is located at the north-east of the Chullora RRP site. The discharge point comprises a 1,050 mm diameter reinforced concrete pipe and 825 mm diameter reinforced concrete pipe, which discharge directly into a concrete lined portion of the Upper Cooks River drainage channel. The existing drainage point includes an interceptor to provide water quality treatment.
- Two 25 kL rainwater tanks and associated harvesting system. The rainwater tanks would help manage surface water flows by capture a substantial proportion of the MRF rooftop surface water flows.

- Erosion and sediment control infrastructure, including:
  - A sediment basin located in the south-western corner of the future development area, with capacity for up to five days rainfall at 85th percentile intensity
  - Silt fences
  - Diversion drains diverting stormwater to the Cooks River stormwater canal.

In addition to the existing infrastructure across the Chullora RRP, the following infrastructure would be installed as part of the Proposal (refer Figure 4-8):

- A stormwater quality treatment management system, comprising:
  - Vortech style gross pollutant traps (GPT)
  - Surface drainage systems to divert and distribute stormwater through the treatment system
  - Bio-retention filtration systems.
- Wastewater management infrastructure, comprising:
  - Any leachate, sediment laden wastewater or oily wastewater generated within the MRF would drain to a sump located within the processing area within the MRF (refer Figure 4-2). Leachate and wastewater quantities that would be generated by the Proposal are expected to be negligible. All waste would be deposited, processed and stored within the fully covered and enclosed MRF building and all product collection and waste drop-off trucks would be covered; eradicating the potential for rainwater to come in contact with waste. The MRF building would be a 'dry' facility with no internal taps. Cleaning and washdown would be carried out via high pressure air with no water used. An overhead misting system would be utilised for dust suppression; however, these systems are designed to provide an atomised spray. This means that no moisture would reach the floor of the MRF. Consequently, daily operations would not generate any leachate. On rare occasions water may be used to clean up spills or leaks. If this water comes into contact with waste minor quantities of leachate may be generated, otherwise this water would be considered wastewater. These quantities would be minor (via hand wash down with buckets) and would not occur on a regular basis. Leachate and wastewater would be discharged to sewer via a trade waste agreement with Sydney Water.
- Fire water capture infrastructure (refer to Section 4.3.5 for a description of fire systems):
  - Two 768 kL inground pits / interceptors in the receival area of the MRF to capture water generated by the sprinkler and deluge system in the event of a fire emergency. These pits are sized to capture the maximum capacity of the sprinkler and hydrants tanks. Any water capture in the inground pits following a fire incident would be pumped and disposed of at an appropriately licensed facility
  - Automated shut-off valves (keystone or knife gate) upstream of the stormwater discharge pipes into the Cooks River stormwater canal. Valves would be triggered by the fire alarm in the event of a fire emergency.

A detailed description of water and hydrology infrastructure is provided in Chapter 9 and Appendix L.



LEGEND

- Chullora RRP site boundary
- Proposal site
- Future stage
- Established earthworks
- Stormwater drainage
- Batter
- Flood detention basin
- Property boundary
- Existing car parking area
- Existing site office

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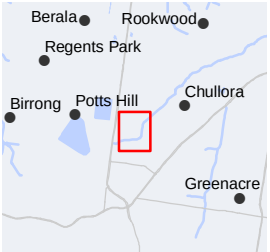


Figure 4-8: Proposed water and hydrology infrastructure

4.3.8 Ancillary facilities and structures

Ancillary infrastructure that would be provided as part of the Proposal would include:

- Two inbound and one outbound automated weighbridge 28 m in length
- A gate house located between the two inbound weighbridges
- All water networks (potable, process, stormwater, leachate and fire)
- A mobile double skinned and bunded 60 KL mobile diesel fuel tank
- Spill kits located at the maintenance workshop within the MRF
- Electrical networks and the re-connection of a substation (located in the north-western corner of the Proposal site).

The proposed locations of the above infrastructure are shown in Figure 4-1.

4.4 Construction

4.4.1 Construction overview

The construction period for the Proposal would be approximately 12 months and is anticipated to commence in early 2021. Construction of the Proposal would be undertaken in three stages (refer Table 4-3):

- Stage 1: Establishment of a hardstand area and internal road network
- Stage 2: Construction of the MRF and installation of fixed plant and equipment
- Stage 3: Installation of ancillary facilities, commissioning, and demobilisation.

Table 4-3 Indicative construction program

Stage	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
Stage 1												
Stage 2												
Stage 3												

Stage 1: Establishment of hardstand

Stage 1 would take approximately four months to complete and would comprise:

- Installation of any inground services and utilities
- Establishment of a hardstand area on the established earthwork platform
- Establishment of internal road network.

It is noted that while minor trenching would be required as part of Stage 1, no major earthworks or excavations are proposed. Any minor trenching or excavations would not extend beyond the fill levels.

Stage 2: Construction of MRF

Stage 2 would take approximately six months to complete and would comprise:

- Construction of the MRF on the hardstand area, including erection of the external and internal walls, frames and roofing
- Installation of building utilities, lighting and plumbing
- Installation of site infrastructure
- Installation of fixed plant and equipment.

Stage 3: Construction of ancillary facilities and equipment commissioning

Stage 3 would take approximately five months to complete. This stage would include:

- Installation of remaining site services and ancillary infrastructure
- Reconnection of existing substation
- Erection of signage of the Proposal site.

Commissioning would be undertaken for the fixed plant and equipment and site utilities during this stage. This would include robust testing of plant and equipment to ensure performance requirements are met. This phase may extend beyond the five month anticipated timeframe until performance of plant and equipment is acceptable and any issues have been resolved. Operation of the facility would commence during this stage. Temporary site structures would then be removed, including any temporary fencing.

4.4.2 Construction workforce and hours

It is anticipated that the construction works force would peak at up to 30 construction personnel.

Works would primarily be undertaken during standard construction hours:

- 7am to 6pm Monday to Friday
- 8am to 1pm Saturday
- No works on Sundays or public holidays.

In some instances, minor (non-intrusive and audible from a surrounding receiver) construction activities may be conducted outside these hours.

4.4.3 Plant and equipment

Various types of plant and equipment would be required for the various construction activities of the Proposal. A summary of the plant and equipment that are likely to be used during the construction of the Proposal is provided in Table 4-4:

Table 4-4 Indicative construction plant and equipment for the Proposal

Equipment	Construction Stage		
	Stage 1	Stage 2	Stage 3
Cherry pickers	✓	✓	
Mobile crane	✓		✓
Forklift	✓	✓	✓
Generators	✓	✓	✓
Hand-held tools	✓	✓	✓

Equipment	Construction Stage		
	Stage 1	Stage 2	Stage 3
Concrete agitators	✓		
Concrete saw	✓		

4.4.4 Construction traffic

Vehicles associated with construction works would include light vehicles (workers travelling to and from site at the start and finish of shifts, during lunch breaks and to conduct errands), and heavy vehicles delivering construction materials and removing waste from construction activities. Heavy vehicles would enter and exit the site using the existing site access into 21 Muir Road. Light vehicles used by construction personnel would be permitted to access the existing parking area via Anzac Street.

Estimated average and peak daily construction traffic movements are outlined in Table 4-5.

Table 4-5 Average and peak daily construction traffic movements

Stage	Estimated maximum daily movements (average throughout construction stage)	Vehicle type
Stage 1	16 movements (8 truck trips)	Medium heavy rigid vehicles Concrete agitators
Stage 2	10 movements (5 truck trips)	Medium heavy rigid vehicles
Stage 3	6 movements (3 truck trips)	Medium heavy rigid vehicles

4.4.5 Construction ancillary facilities

A temporary site office, with lunchroom and amenities would be utilised for construction works under the Proposal. The temporary site office would be located within the Chullora RRP boundary.

4.4.6 Construction Environmental Management Plan

A Construction Environmental Management Plan (CEMP) would be prepared for the construction of the Proposal. This CEMP would be prepared based on the mitigation and management measures in this EIS (refer to Chapter 22) and the conditions of approval provided by the DPIE. The CEMP would provide the framework for the management of all potential environmental impacts resulting from the construction activities.

4.5 Operation

The key operational components of the Proposal would include:

- Receival of kerbside co-mingled recyclables from municipal and C&I sources within an enclosed tipping area, with manual and mechanical removal of hazardous or problematic items such as batteries
- Recovery of non-putrescible recyclables items including rigid plastic containers, ferrous and non-ferrous metals, for export from the site
- Beneficiation (value-add processing) of fibres and plastics for export from the site.

Key operational details are included in Table 4-6 and described in the sections below. An indicative flow diagram of a typical SUEZ MRF is provided in Figure 4-9. As the Chullora MRF would produce higher quality output than a typical MRF, the proposed facility would include additional processing

equipment than what is described in the indicative flow diagram. Further detail on processing equipment is provided in Section 4.5.2.

Table 4-6 Key operational details

Operational component	Operational control
Processing limit	172,000 tpa
Waste source	Municipal and commercial dry recyclable materials
Types of waste processed	Household and C&I co-mingled and source-separated recyclables, paper and cardboard and mixed plastics
Operating hours	24 hours a day, seven days a week, 52 weeks per year (required to maintain environmental controls and ideal processing conditions for the waste).
General type of equipment used for processing	Equipment to be utilised on site would include the following: • Mobile plant: – Front end loader – Forklifts • Fixed plant and equipment: – State of the art in line processing / separating plant – Conveyors and elevated sorting stations – Screening equipment including magnets, wind sifters, optical sorters, eddy current separators – Balers.
Number of employees	Approximately 45 FTEs

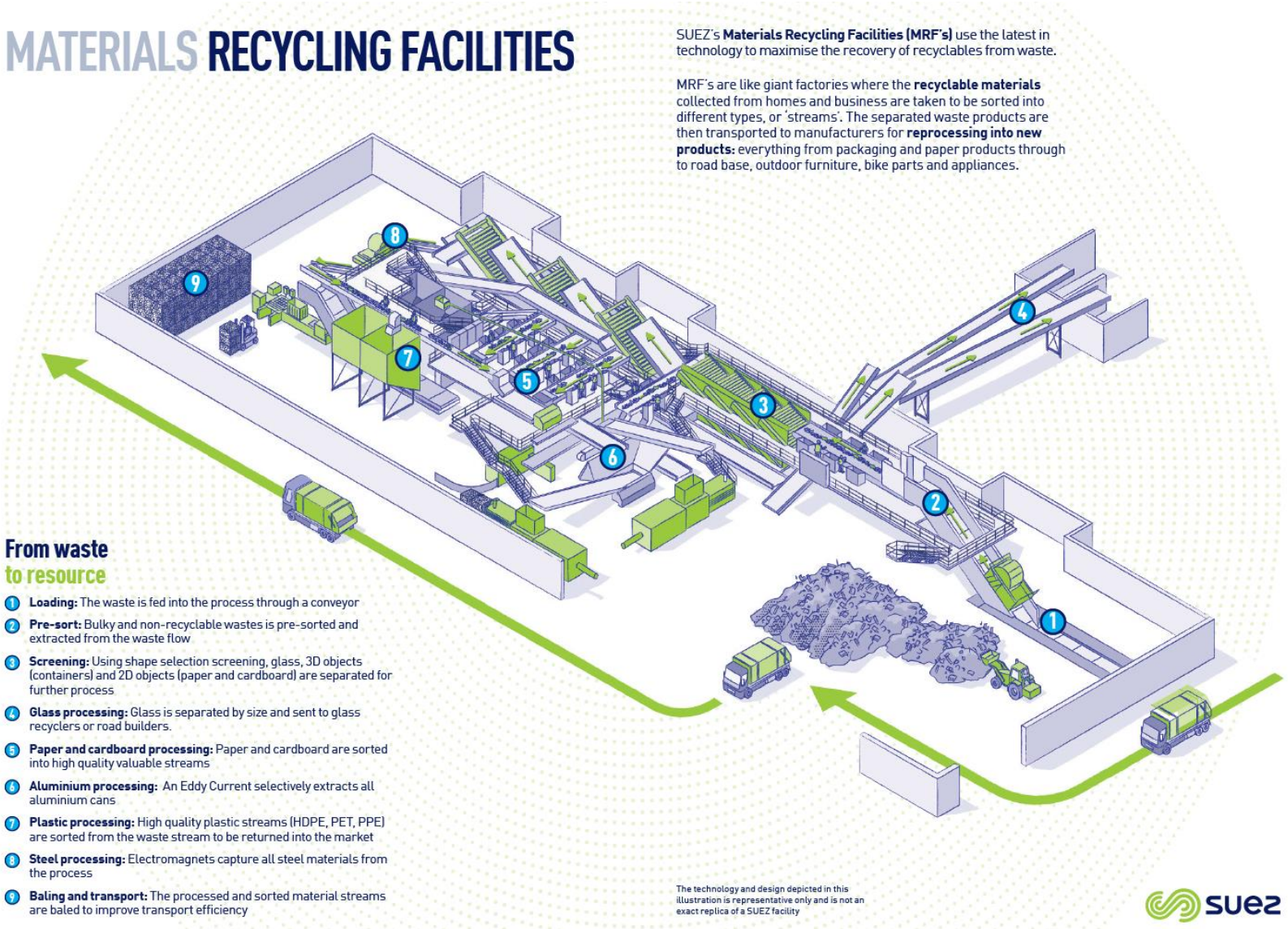


Figure 4-9 Indicative MRF process

4.5.1 Waste streams

Waste streams intended to be accepted under the Proposal would all comprise dry recyclables from municipal and C&I sources including:

- Co-mingled material collected from municipal and C&I sources
- Source separated paper and cardboard
- External mixed plastics.

All accepted waste streams are classified as general solid waste (non-putrescible) under the *Waste Classification Guidelines* (NSW EPA, 2014b).

Unexpected finds of non-conforming materials such as tyres, batteries, polystyrene, gas bottlers and fire extinguishers would be permitted for storage only – for the purposes of safe and lawful handling, storage and transport to a lawful facility. Quantities of these materials would be limited to waste identified during inspection and resource recovery operations; being unexpected finds in tipped, unprocessed and processed materials.

The processing of waste within the MRF would generate twelve commodity waste streams as well as any residual material, including:

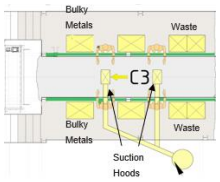
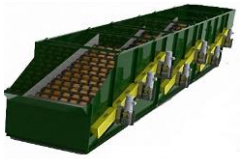
- Old Corrugated Cardboard (OCC)
- Old Newspaper (ONP)
- Mixed paper
- High Density Polyethylene (HDPE) Clear
- HDPE colour
- Polyethylene Terephthalate (PET) Clear
- PET Colour
- Polypropylene (PP)
- Mixed Plastic 1-7
- Glass
- Aluminium
- Steel
- Residual material.

4.5.2 Processing equipment

The indicative plant and equipment to be utilised in the MRF may include the following:

- Mobile plant including:
  - A front-end loader used to push material within the waste receival area into the appropriate reception bunker and to feed the process line
  - Two forklifts used to manage the final product bales in the product storage area
- Three 28 metre weighbridges (two inbound and one outbound)
- Processing / separating plant incorporating various sorting plant (described in Table 4-7).

*Table 4-7 Description of processing equipment**

Sorting plant	Example of equipment	Description
Chain conveyor and drum feeder		The chain belt conveyor would feed material onto a drum feeder system.
Manual sorting stations		Manual sorting stations facilitate manual sorting of recyclables and removing large contaminants.
Glass breaker screen		Rotating discs reduce the size of the glass and screens it out of the product streams.
Screen (glass cleaning)		The first cleaning stage is to separate the fines so that cleaning is more effective. Glass cleaning stages are critical to secure potential offtakes and avoid sending this material to landfill.
Wind sifter (glass cleaning)		Heavy contaminants are removed using controlled air as a separation medium. The remaining materials continue on to the bottle perforator.
Fibre separation screen		Cardboard, large and small paper are separated into three separate streams. The cardboard continues straight to quality control then to baling. The large paper goes onto the ‘large paper’ ballistic screens and the small paper goes onto the ‘small paper’ ballistic screen.
Ballistic separators x2 for large paper stream and x2 for small paper		The ballistic screens remove contaminants from the paper streams. Contaminants are mainly plastics and plastic bottles which go to further plastic processing or landfill. Two ballistic screens in sequence are required in order to remove contaminants down to the required level. The paper streams then go to the relevant optical screens
Magnet		Ferrous metals are removed using an overhead magnet suspended above or in line with a conveyor belt.

Sorting plant	Example of equipment	Description
Near infra-red optical screen x2 for large paper stream and x2 for small paper stream		The optical screens use near infra-red resolution to scan and remove non-fibre (mainly plastics, tetrapak) from the paper streams. The two optical sorters would remove contaminants down to the required level. The paper streams are then transferred to quality control and onto the balers.
Eddy current separator		Captures non-ferrous metals from the material stream. Aluminium from the separator falls onto a Quality Control station conveyor and to the aluminium storage silo.
Balers		The paper streams are compressed into bales and ready for sale. Two balers are required for the outputs: one for the large paper line, and one for the small paper line.
Conveyors		A series of conveyors would be required within the processing equipment. Conveyors would either infeed waste or be used to transfer waste once processed into the outgoing storage area.

** It is noted that the processing equipment described in this section is indicative and would be subject to detailed design.*

4.5.3 Waste processing

The MRF would process waste material via a combination of automated mechanical separation and manual sorting processes. Manual sorting is an essential quality control element of any mixed waste recovery process given the wide variety of materials that need to be extracted, either as products for recovery or as contaminants to be removed. It also provides a high degree of flexibility to adapt the sorting effort and allows targeting of materials according to the composition and quality of the waste stream.

As noted in Section 4.5.1 three incoming waste types (co-mingled material, source separate paper and cardboard, and external mixed plastics) would be processed within the MRF to generate 12 commodity outputs. The below section provides a description of the indicative process for generation of these 12 commodity outputs grouped as follows:

- Cardboard, mixed paper and newspaper
- Containers
- Glass and metals.

The MRF processing plant and equipment would have the ability to process up to 35 tonnes per hour (tph) of co-mingled recyclables. This includes 30 tph of cardboard and paper processing capacity and 5 tph of containers processing capacity. Figure 4-10 to Figure 4-12 show the indicative steps for the processing of the waste.

Broadly the waste processing would involve the following elements (noting that some steps could occur concurrently):

1. **Loading:** The waste is fed into the process through a conveyor
2. **Pre-sort:** Bulky and non-recyclable wastes would be pre-sorted and extracted from the waste flow
3. **Screening:** Glass, 3D objects (containers) and 2D objects (paper and cardboard) would be separated for further process using shape selection screening
4. **Glass processing:** Glass is cleaned, separated by size and sent to glass recyclers or road builders.
5. **Paper and cardboard processing**: Paper and cardboard would be sorted into high quality valuable streams
6. **Aluminium processing:** An Eddy Current selectively extracts all aluminium cans
7. **Plastic processing:** High quality plastic streams (HDPE, PET, PP) would be sorted from the waste stream to be returned into the market
8. **Steel processing:** Electromagnets capture all steel materials from the process
9. **Baling and transport:** The processed and sorted material streams are baled to improve transport efficiency.

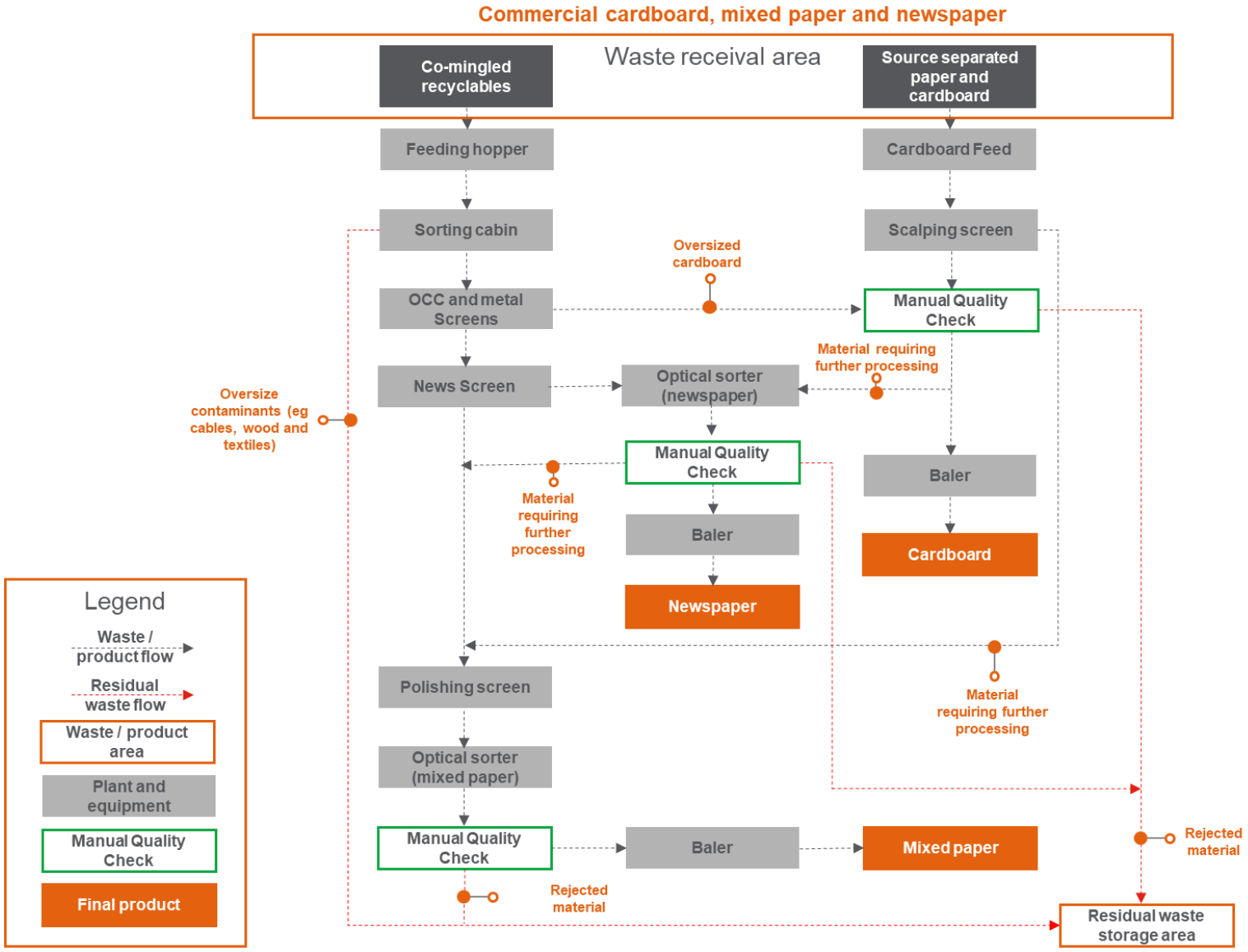


Figure 4-10 Indicative waste process flow for separating / processing into final products; cardboard, newspaper and mixed paper

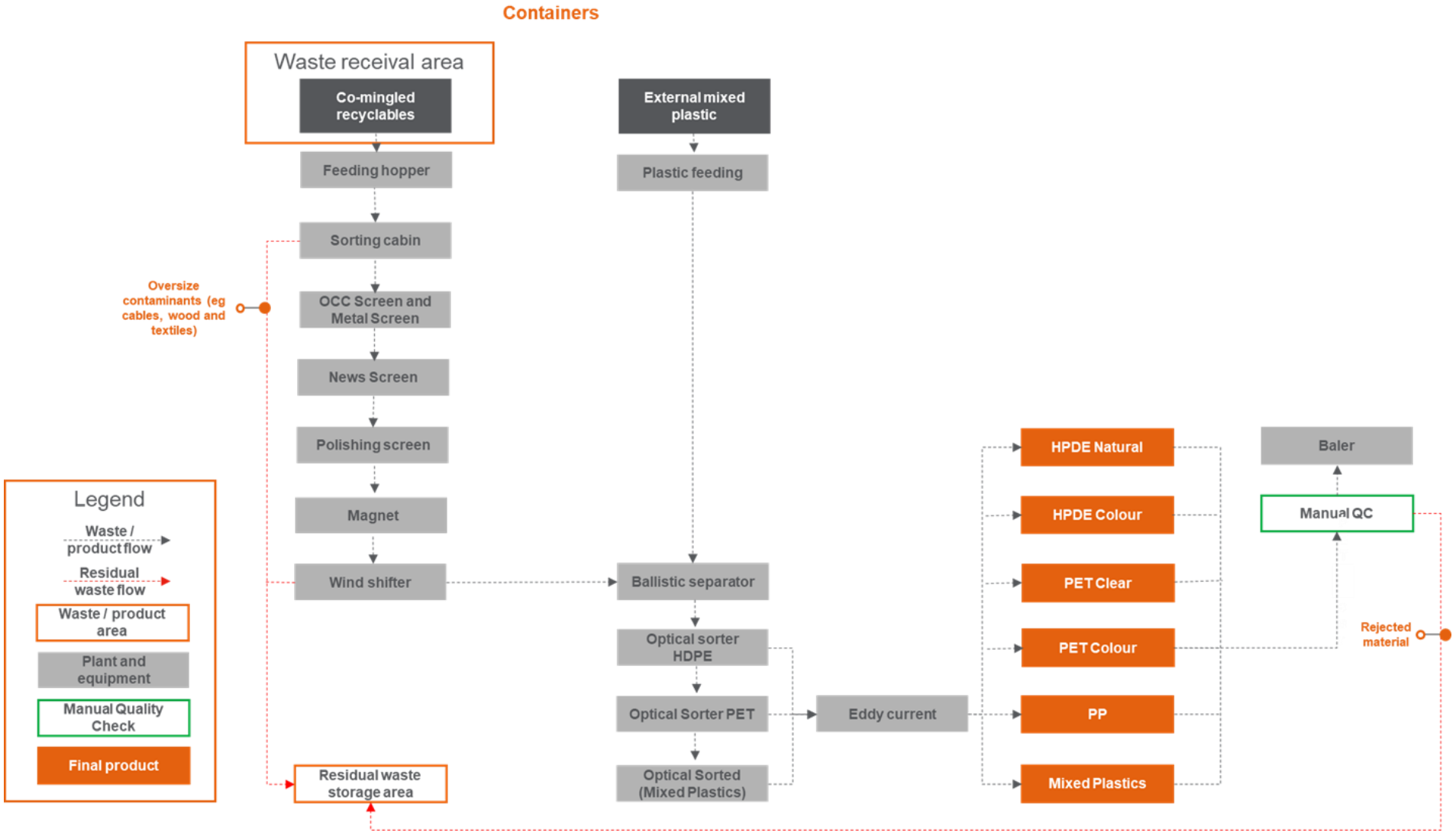


Figure 4-11 Indicative waste process flow for separating / processing plastics into final products

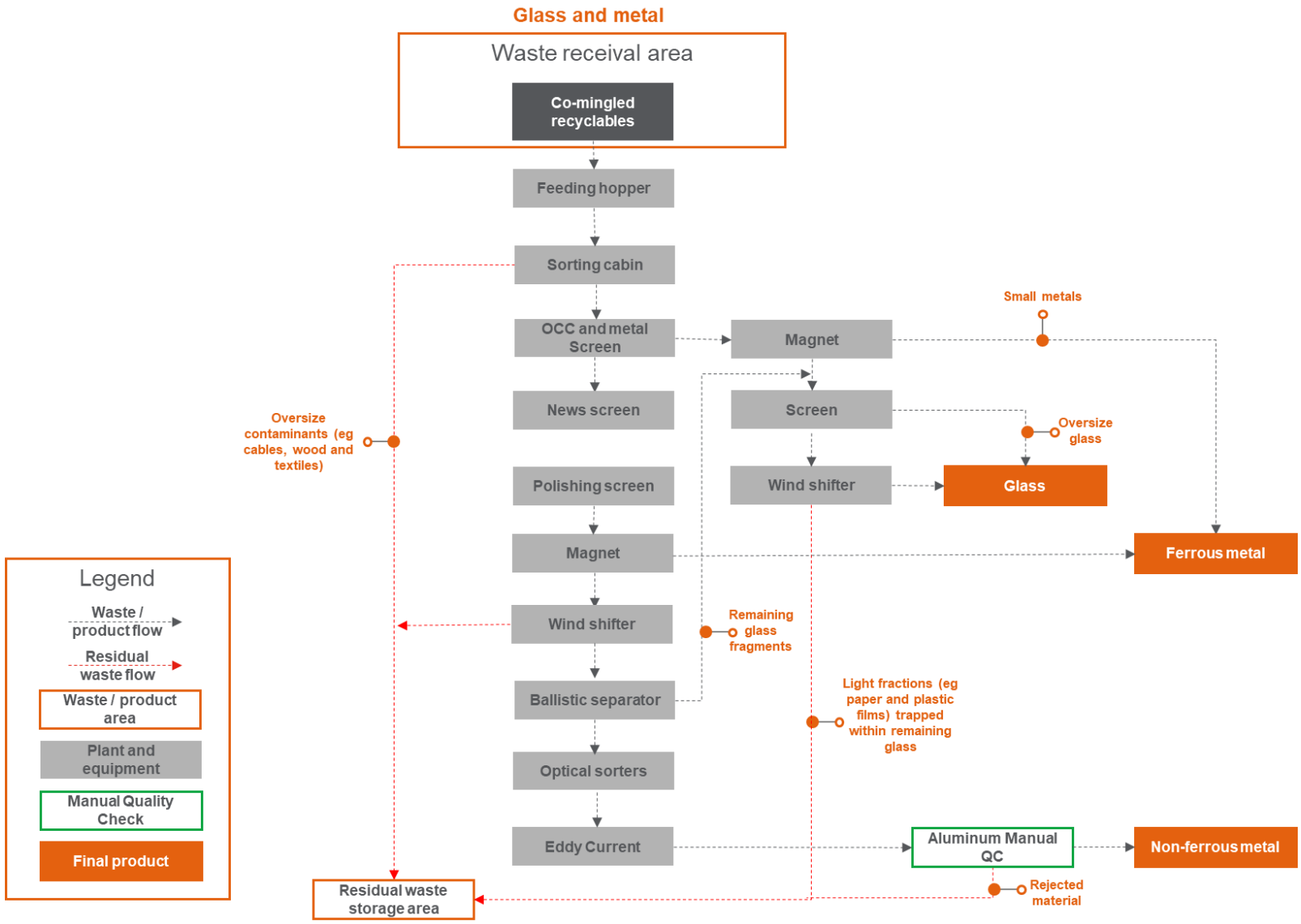


Figure 4-12 Indicative waste process flow for separating / processing glass and metals

4.5.4 Storage capacity

Receival area

Incoming waste would be temporarily stored in the waste receival area prior to processing and transportation. External mixed plastics would be deposited directly into the processing area of the MRF via unloading of a curtain-sider into one of the roller shutter doors and would therefore not require temporary storage within the product receival area.

Figure 4-2 shows the tipping floor bays within the receival area. The western bay within the receival area would be a dedicated commercial cardboard drop-off area, with volume of approximately 1,150 m^3. The eastern two tip floor areas would be utilised for the tipping of co-mingled recyclable material. The two area would have a combine volume of approximately 3,000 m^3.

The density of incoming waste can vary depending on the origin and composition of loads on a day to day basis. Table 4-8 shows the waste tonnage storage capacity within the receival area for each waste stream; showing a range to account for circumstances when lighter density or heavier density loads are received. Paper and cardboard are typically a heavier material than co-mingled material. Consequently, only a high-density scenario has been considered for paper and cardboard.

Given that waste processing could occur 24 hours per day seven days per week it is considered unlikely that the tipping floors would ever be at their full capacity, as waste would be continuously processed. However, as shown in Table 4-8, the receival hall would have sufficient area to store more than an average days' worth of received waste, providing contingency in a worst-case scenario of any unscheduled breakdowns.

Table 4-8 Waste storage volumes within receival area

Waste type	Tipping floor capacity (m^3)	Average density scenario capacity (t)	High density scenario capacity (t)	Average anticipated daily throughput capacity (t)
Paper and cardboard	1,150	-	322	192
Co-mingled recyclables	3,000	540	840	442

Product storage area

A description of the storage bays within the product storage area is provided in Section 4.3.1. The MRF would produce up to 12 different commodities (refer Section 4.5.1). The proportion of each commodity would be dependent on the composition of the inbound material and would vary from time to time. With the exception of the glass and residual storage bays, each storage area could be utilised for each of the output commodities.

Once processed and baled, product would have a higher density than when tipped as co-mingled was which would vary depending on the specific product. Table 4-9 shows the anticipated capacity for product stored in the product storage area. Importantly the product storage area would have capacity to store multiple days' worth of product. Having the ability to store appropriate quantities of output product would ensure that the facility has the flexibility to respond to fluctuations in customer demand, and would ensure transportation efficiency is maximised (as product could be stored until a sufficient volume of any give product existed to completely fill a vehicle prior to transportation off site).

Table 4-9 Product storage volumes within the product storage area

Product	Storage bay capacity (m^3)	Average density scenario capacity (t)	High density scenario capacity (t)	Average anticipated daily output (t)
OCC				
ONP				
Mixed Paper				
Steel				
Aluminium	4,530	1,585	2,000	376
HDPE Natural				
HDPE Colour				
PET Clear				
Mixed Plastic				
Glass	150	-	375	190
Residue	260	-	91	85

4.5.5 Non-conforming waste

Any waste tipped on the reception floor that is determined to be non-conforming would need to be manually removed from the waste processing activities and be treated as a residual / rejected waste stream. A bunker would be located under the sorting platform for non-conforming waste to be diverted to. Any non-conforming waste would be treated as residual waste, if appropriate, and collected for disposal at landfill on an as needs basis.

The Proposal would not accept hazardous materials. However, on occasion, items may be discovered in the received materials that contain hazardous substances or non-conforming waste. These non-complying materials will be managed in accordance with asbestos and non-complying waste management procedures. Potentially hazardous substances would be deposited in a special bin allocated within the sorting cabin and would be removed offsite to an appropriately licensed facility.

Polystyrene would be considered a non-conforming waste. While polystyrene is not accepted within recycling bins there is potential for it to enter the Proposal as contamination within other waste loads. Due to the flammable nature of polystyrene it would be removed from the MRF immediately. A dedicated bin would be provided for any polystyrene which would be regularly checked and emptied.

Key procedures for managing non-conforming waste will be outlined in the Chullora RRP's Operational Environmental Management Plan (OEMP), and may include:

- Spot checking and inspection of incoming waste prior to its stockpiling or processing to minimise the risk of non-conforming material in processed and recovered waste materials
- Recording details of non-complying waste deliveries
- Review of the waste processing systems in-line with EPA requirements,
- Increasing the level of appropriate and safe recycling of waste in a sustainable and environmentally sound manner.

4.5.6 Delivery and collection of waste

Waste disposal and collection vehicles would originate from various locations across the greater Sydney region. Vehicles would enter / exit the Proposal site via Muir Road. All heavy vehicles would access Muir Road via the Hume Highway or Rockwood Road. The driveway accessing the Proposal site includes two 100 metre queueing lanes capable of stacking two heavy vehicles side by side and on average 20 vehicles in total. The queuing lanes would ensure trucks would not need to queue on Muir Road. Vehicles would exit the Proposal via Muir Road using the left turn only lane. An analysis of vehicle queuing needs is present in Section 7.5.6 of this EIS.

Waste drop-off heavy vehicles

Heavy vehicles dropping off waste in the receival area of the MRF would enter the Proposal site via the existing driveway access into 21 Muir Road. Waste drop-off vehicles would include a combination of MRVs and articulated semi-trailers (including curtain-siders and walking floor trailers) (refer Figure 4-13). MRVs and walking floor trailer vehicles carrying co-mingled recyclables and paper and cardboard would be weighed-in over the entry weighbridges, before proceeding to the waste receival area by circumventing the eastern side of the MRF shed, and reversing and depositing their load onto the tipping floor. Up to four vehicles could deposit waste simultaneously into the waste receival area. Walking-floor trailer vehicles could only deposit waste via the two eastern most doors.

After depositing waste on the tip floor, waste drop-off vehicles would exit and loop around the western perimeter of the MRF shed and be weighed out over the exit weighbridge.

Curtain-siders carrying external plastics would pull up adjacent to the roller shutter doors either on the eastern or western side for the waste processing shed and have their load directly unloaded into the processing area via forklifts, before proceeding to the outbound weighbridge.

The heavy vehicles would exit using the left turn only lane onto Muir Road. Waste drop-off vehicles would not be used to collect product from the product storage area to present risk of contamination.



Figure 4-13 Example of MRV and walking floor trailer / curtain sider

Table 4-10 Examples of waste drop-off vehicles

Waste type	Truck type	Maximum per load	Deposition area
Co-mingled recyclables	MRV	6 tonnes	Any of the four unloading bays in the receival area
	Walking floor trailer	22.5 tonnes	Eastern two unloading bays in the receival areas
Cardboard	Walking floor trailer	22.5 tonnes	Eastern two unloading bays in the receival area
External plastics	Curtain-sider	22.5 tonnes	Eastern or western side of the processing area (outside of shed)

Product collection heavy vehicles

Product collection vehicles would enter the Proposal site via Muir Road and continue to the queueing lanes and entry weighbridges. Collection vehicles would either be loaded within the product storage area via front end loaders or adjacent to the roller shutter doors on the eastern or western side of the product storage area under awnings. The truck types used to collect processed waste would vary depending on the waste stream to be collected and could include (refer Table 4-11):

- Triple axle rigid vehicles (carrying 40-foot (ft) shipping containers)
- B-doubles up to 25 m in length
- Truck and dogs.

The internal road network around the MRF would allow sufficient space for vehicles to pass any vehicles parked adjacent to either side of the MRF for loading. One vehicle could be loaded out of the eastern and one out of the western side at the same time if required. In the event that a third product collection vehicle arrives at site at the same time the additional vehicle would traverse around the entire MRF and wait in a holding zone immediately to the north of the MRF until a loading space were to become available. The TIA (Appendix J) provides further detail on the vehicle types and numbers, internal movements and manoeuvrability of vehicles (via swept path analysis).

Table 4-11 Examples of product collection vehicles

Material Type	Truck Type	Average load per truck	Collection area
• OCC	B-Double	55 tonnes	
• ONP • Mixed paper • Steel • Aluminium • HDPE natural • HDPE colour • PET clear • Mixed plastic • Residual material	Heavy Rigid Vehicle	22.5 tonnes	• Adjacent to product storage area • Within product storage area

Material Type	Truck Type	Average load per truck	Collection area
Glass	Truck and dogs	42 tonnes	• Adjacent to product storage area • Within product storage area

Light vehicles

Light vehicles accessing the Proposal site would predominantly be staff vehicles. Parking would be provided adjacent to the site office and within the north-eastern portion of the Proposal site. Light vehicles would therefore enter / exit the Proposal site via the secondary Proposal site entrance off Anzac Street. An analysis of parking need is provided in Section 7.5.5, demonstrating that the existing car park has sufficient capacity to support existing and proposed operations at the Chullora RRP.

Traffic movements

Waste drop off and product collection could occur 24 hours per day, 7 days per week. It has conservatively been assumed that vehicles would largely arrive during weekdays (Mon-Fri), however some loads may be dropped-off / collected on weekends. Waste drop-off (inbound) vehicles would largely occur as follows:

- Cardboard would be dropped off by walking trailer rigid vehicles largely between midnight and 5am (outside of peak operation hours)
- External plastics would be dropped off by curtain-sider vehicles largely between midnight and 5am (outside of peak operation hours)
- Co-mingled recyclables would be dropped by a mix of MRVs and walking-floor trailers across the 24-hour operational period.

Product collection vehicles (outbound) would comprise triple-axle rigid vehicles, truck-and-dogs and B-doubles. A conservative estimate of vehicle movements has been based on assuming the majority of product would be collected by triple-axle vehicles. The use of B-doubles to collect product would achieve a reduction in number of collections. Additional detail on vehicle movements is presented in Section 7.5.1.

Table 4-12 presents the number of proposal vehicle movements. It is noted that, while waste drop-off and product collection would occur 7 days per week, it is anticipated that the volume of traffic on weekdays would be higher than that of weekends. As a result, the daily truck movements presented in Table 4-12 presents the highest anticipated number of vehicle movements for a weekday. In summary, the Proposal site would generate on average up to 105 vehicle trips (two-way) per day, comprising up to 78 trips (two-way) for waste drop-off vehicles and up to 27 trips (two-way) for waste collection vehicles. Peak periods have also been considered to account for those days where a higher than average quantity of waste is received at the facility, equating to a total of 132 vehicles trips (two-way) in the peak day.

Table 4-12 Proposal vehicle movements

Period	Vehicle Trips (two-way)	Vehicle Movements (one-way)
Inbound waste (i.e. Delivery vehicles)		
Per year	20,280	40,560
Per week	390	780
Per day	78	156
Peak day	101	202

Period	Vehicle Trips (two-way)	Vehicle Movements (one-way)
Peak hour	9	18
Outbound product (i.e. collection vehicles)		
Per year	7,020	14,040
Per week	135	270
Per day	27	54
Peak day	31	62
Peak hour	3	6

4.5.7 Waste tracking

Part 3 of the *Protection of the Environment and Operations (Waste) Regulation 2014* requires the Proposal to track incoming and outgoing waste material in accordance with the Waste Levy Guidelines (NSW EPA, 2018). These records would be kept and maintained in accordance with the SUEZ waste information system and would include:

- Volume, type and stream of incoming and outgoing waste material
- Volume and description of any other incoming and outgoing material
- Date and times of incoming and outgoing waste material
- Name and address of origin and destination facilities
- Transport vehicle registrations and weights.

This data would be captured by electronic data capture systems at the automated weighbridges operating at the entry and exit points of the Proposal site (refer to Figure 4-1). In the event that these automated systems are out of operation, data would be manually recorded and entered into the electronic data capture system as soon as possible. Electronic records would be backed up on a weekly basis and stored in a secure location.

These records would be kept and maintained for a period of at least six years and would support the submission of monthly waste and resource contribution reports to the EPA. Records would also be made available to the EPA at other times when requested.

4.5.8 Dust suppression

The processing activities described in Section 4.5.3 may result in the generation of minimal quantities of dust. The majority of the dust produced would result from the sorting and baling of cardboard, mixed paper and newspaper waste, while the processing of container and metal waste streams is not anticipated to generate significant levels of dust.

In order to minimise the amount of dust produced, the MRF shed would be enclosed and dust suppression systems would be used within the MRF, including:

- Enclosing and misting of major transfer points
- Misting of transfer points
- Misting of screens.

In addition, all internal roads would be fully sealed to minimise any external dust generation and transportation.

4.5.9 Operational workforce and hours

The operation of the Proposal site would employ approximately 45 FTE employees. Employees would generally access the site via two shifts with approximately half of all employees operating the MRF in each shift (although noting fewer staff may be used during night-time and weekend periods). Additional employees may be used to cover absences or leave.

The Proposal would operate 24 hours per day 7 days per week.

4.5.10 Processing capacity

Sections 4.5.3 to 4.5.9 describe the key indicative operational components of the MRF. Once operational the MRF would process up to 172,000 tpa. A number of operational processes would be carried out concurrently which can be divided into three key steps in the operation of the facility, namely:

- Delivery of waste to the receival hall
- Waste processing
- Collection of product from the product storage area.

Delivery of waste to the receival hall

Section 4.5.6 describes the waste drop-off process that would occur at the MRF. Waste drop-off vehicles would carry out the following key steps when circulating through the Proposal site:

- Enter the site, queue in queuing lanes
- Weigh-in via the weighbridges
- Travel to the receival area, reverse and tip waste
- Exit via outbound weighbridge.

Table 4-13 presents the timing and concurrence of waste drop off activities. It is noted that these timings are considered overly conservative, and that waste drop-off vehicles may not require the full time allotted to drop-off waste.

Vehicles may carry out these activities simultaneously (e.g. a vehicle can be being weighed in while another vehicle is reversing into the receival area).

Table 4-13 Waste drop off activities – timing and concurrence

Activity	MRV (minutes)	Walking-floor rigid vehicle (minutes)	Number of vehicles that can undertake activity concurrently
Site entrance and queuing	N/A	N/A	20
Truck weigh-in	1	1	2
Travel to receival area	3	3	3
Tipping of waste	10	20	4
Travel to outbound weighbridge, truck weigh-out and site exit	4	4	1

Assuming waste would be deposited in equal proportions by MRVs and walking-floor rigid vehicles, in a peak hour a maximum of two MRVs and one walking-floor rigid vehicle would access the site in any given hour allowing sufficient time for the above activities to be carried out.

Waste processing

The MRF would process waste as per the hours described in Section 4.5.3. Based on the maximum annual throughput outlined in Section 4.5.1 an average daily tonnage per waste stream has been ascertained (refer Table 4-14). It is noted that this daily tonnage assumes the majority of waste would be received on weekdays and is therefore conservative as waste could also be deposited across the weekend periods. Although the majority of days are anticipated to receive close to the average daily tonnage it is noted that there may be some days where more, or less, waste is received at the facility and that these numbers represent an average. Typically, waste peaks on one or two days each fortnight due to kerbside collection timetabling or during holidays periods. Based on SUEZ' review of their existing waste contracts and historic operations these peaks typically equate to up to 130 per cent of an average day.

Table 4-14 provides a description of the anticipated tonnes that would be received at the MRF, by waste stream, on an average day and week. A peak scenario has also been considered to account for those days where a higher than average quantity of waste is received at the facility, equating to 130 per cent of the average day for a single day. Across a week, the peak scenario has assumed that up to two days within the week would be 'peak days' with the remaining days equally an 'average day'. This is considered a conservative peak week estimate as it is considered unlikely that two days within a single week would experience peak conditions, and in such weeks, it is likely that the remaining days may have a lower throughput than average.

Table 4-14 Average and peak throughput by waste stream

Tonnes	Co-mingled recyclables	Cardboard and paper	External plastic
Tonnes per annum	115,000	50,000	7,000
Average			
Tonnes per day	442	192	27
Tonnes per week	2,210	960	135
Peak scenario			
Tonnes per day	575	250	35
Tonnes per week	2,476	1,076	151

Plant and equipment processing speeds are described in Section 4.5.3. Given the operational hours (24 hours per day, seven days per week) the processing speed of plant and equipment is sufficient to process the anticipated weekly throughput, even under a peak scenario, noting that each of the three waste streams could be processed simultaneously. Even when allowing for plant and equipment to operate at 85 per cent capacity to allow for stoppages, personnel breaks / rotations and any unforeseen events the MRF would have ample capacity to process the proposed throughput for each waste stream.

Collection of product

Once processed, product would be collected by truck-and-dogs, B-doubles and triple-axle rigid vehicles. Only one to two collection vehicles are expected to arrive at the site in any given hour. Further, two vehicles can be loaded simultaneously from the product storage area (one on the eastern side and one on the western side). In the event an additional product collection vehicle arrives onsite while vehicles are being loaded, a holding bay can be utilised adjacent to the northern external wall of the MRF. Therefore, there is sufficient time for product loading.

Contingency

The equipment that would be used in the MRF is robust and appropriately designed for the heavy-duty nature of the application, but processing of waste is an aggressive and harsh application. The equipment is naturally prone to blockages and requires a relatively high degree of maintenance attention. Heavy materials and difficult waste such as cables and garden hoses, all contribute to blockages and high rates of wear and tear.

A number of contingency measures would be put in place to minimise the risk of equipment shutdown or failure, including:

- A proactive, planned maintenance regime, regular inspections and good housekeeping practices to minimise unplanned downtime
- An in-house maintenance team and dedicated workshop area within the MRF, allowing responses to issues
- Abundant storage capacity within the product storage area. As noted above the storage capacity allows for substantial volumes of waste to be stored prior to collection being required. It is anticipated that bays within the product storage area would typically have a ‘backlog’ of waste awaiting collection. Therefore, transportation of waste from the MRF can continue for a period while plant and equipment are maintained
- Spare processing capacity. The processing capacity of the MRF, as noted above, exceeds the proposed weekly throughput, even under peak conditions. This provides a buffer to mitigate any shutdown periods. That is, plant and equipment can be shut down for prolonged periods without impacting the MRF’s ability to process 172,000 tpa.

Based on the above contingency measures, plant and equipment shutdown or maintenance periods are not anticipated to impact the ability of the MRF to process 172,000 tpa.

4.5.11 Hazardous and dangerous goods storage

Some potentially dangerous goods would be stored within the workshop area within the product storage area of the MRF and would support the broader Chullora RRP activities (in cages and appropriately bunded as required). These would largely comprise cleaning products, solvents and paints which are not considered to be hazardous. Table 4-15 describes the proposed potentially hazardous goods that would be stored onsite. An assessment of hazards and risks is presented in Chapter 12.

Table 4-15 Summary of proposed hazardous good storage

Chemical/ material	Use	Maximum quantity to be stored onsite (estimated)*	Dangerous Goods Class
Diesel fuel	Equipment and machinery refuelling	60,000 L self-bunded tank	C1 Combustible liquids
Oils and greases	Equipment and machinery	5,000 L housed in 240 L drums	C2 Combustible liquids

Chemical/ material	Use	Maximum quantity to be stored onsite (estimated)*	Dangerous Goods Class
LPG	Equipment and machinery	<10 t in caged cannisters	Flammable gas

4.5.12 Site security

The Proposal site includes a number of on-site security measures to ensure the protection and safety of the Proposal site, its employees and customers. Security at the Proposal site would include:

- Fencing around the perimeter
- A controlled site access system
- A CCTV security system at key locations
- Two way radios used by onsite personnel for day to day security
- An integrated telecommunications system which involves connection to all main buildings and structures.

4.5.13 Ancillary infrastructure

Ancillary infrastructure is described in Section 4.3.8. The operation of the Proposal would be supported by the operation of the following infrastructure:

- Inbound and outbound weighbridges
- A gatehouse
- Fire systems
- Rainwater harvesting tanks
- Electrical substation
- Stormwater infrastructure
- A flood detention basin.

Conclusion

The Proposal is to develop and operate a MRF to process co-mingled recyclable MSW and dry C&I waste; with a material processing capacity of up to172,000 tpa.

The Proposal would represent a critical piece of waste management infrastructure which would mitigate significant capacity constraints currently impacting the Sydney region and provide advanced recycling processing capacity to build resilience within the current network of recycling facilities as well as promote the principles of a circular economy through implementation of a pull-through model that conceives of the sorting, reprocessing and specified end uses of processed materials as an integrated, closed loop solution.

The Proposal has been designed and would be operated to ensure that operational efficiency and consistency is maximised and would have sufficient capacity to adequately process the proposed throughput. While the equipment that would be used in the MRF is robust and appropriately designed for the heavy-duty nature of the application, surplus processing time and contingency has been included throughout the Proposal to account for any stoppages or unscheduled maintenance needs, allowing the Proposal to continue to provide critical waste management infrastructure.

In addition, the Proposal has been designed with particular emphasis on fire management infrastructure to ensure robust fire safety, with all built form elements robustly designed.

5 STATUTORY PLANNING APPROVALS

Summary

There are a number of relevant legislation and planning instruments applicable to the Proposal at the Commonwealth, national, state and local levels.

The Proposal would be considered SSD under Clause 23 (waste and resource management facilities) of Schedule 1 of the SEPP (State and Regional Development) as the Proposal would process more than 100,000 tonnes per year of waste.

The relevant local planning instrument is the *Bankstown Local Environmental Plan 2015* (BLEP 2015). The Proposal site is zoned IN1 General Industrial, which under Division 23 of *State Environmental Planning Policy (Infrastructure) 2007* (ISEPP) is a prescribed zone in which a waste or resource management facility is permissible with consent.

The *Protection of the Environment Operations Act 1997* (POEO Act) is the key piece of environmental protection legislation administered by the Environment Protection Authority (EPA). Under the POEO Act, activities that will or are likely to cause pollution are identified as scheduled activities and require an Environmental Protection Licence (EPL). The Proposal would trigger an EPL requirement for four-hour waste processing (non-thermal treatment) and waste storage. The previous Chullora RRC holds an existing EPL (5983) which could either be updated via a variation application or a new one sought for the Proposal.

The *Protection of the Environment Operations (Waste) Regulation 2014* (POEO (Waste) Regulation) requires tracking of certain waste within NSW and between participating states. Under the POEO (Waste) Regulation, the Proposal would require a weighbridge as it would process over 10,000 tpa of waste.

There are also a number of state and regional planning policies applicable to the Proposal that have been taken into consideration in this EIS including *State Environmental Planning Policy (State and Regional Development) 2011*, *State Environmental Planning Policy (Infrastructure) 2007*, *State Environmental Planning Policy No.33 – Hazardous and offensive development*, *State Environmental Planning Policy No. 55 – Remediation of land*, *State Environmental Planning Policy No. 64 – Advertising and signage*, Canterbury-Bankstown Development Control Plan and BLEP 2015.

5.1 Introduction

This section provides an overview of the relevant legislation and planning instruments applicable to the Proposal. It includes a description of the planning approval pathway for the Proposal. Table 5-1 provides a summary of the relevant SEARs which relate to the statutory planning approvals for the Proposal, and where these have been addressed in this EIS.

Table 5-1 SEARs statutory (planning approvals)

SEARs	Where addressed
General rrequirements	
The environmental impact statement (EIS) must be prepared in accordance with, and meet the minimum requirements of, clauses 6 and 7 of Schedule 2 of *the Environmental Planning and Assessment Regulation 2000*. In addition, the EIS must include a: • consideration of all relevant environmental planning instruments, including identification and justification of any inconsistencies with these instruments	Chapter 5

5.2 Commonwealth legislation

5.2.1 Environmental Protection and Biodiversity Conservation Act 1999

The Commonwealth EPBC Act provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places defined in the Act as Matters of National Environmental Significance (MNES) – as well as to govern actions undertaken on Commonwealth land. The MNES that are protected under the EPBC Act are:

- World heritage properties
- National heritage places
- Wetlands of international importance
- Listed threatened species and ecological communities
- Migratory species
- Commonwealth marine areas
- The Great Barrier Reef National Park
- Nuclear actions (including uranium mines)
- An action on Commonwealth land which is likely to have a significant impact on the environment
- Coal seam gas activities that pose risk to water resources.

In accordance with sections 67 and 67A of the EPBC Act, any works that have the potential to result in an impact on any MNES or are on Commonwealth land are considered ‘controlled actions’ and require a referral to the Federal Minister for the Environment for approval.

A search of the EPBC Protected Matters Search Tool was undertaken on 19 November 2019 for the Proposal site with a one km buffer. The search identified a number of threatened species (33), migratory species (16), threatened ecological communities (4) as potentially occurring within one km of the Proposal site.

A biodiversity assessment was conducted of the Proposal site to determine the potential for impact to threatened species, ecological communities, migratory species or other MNES as listed under the EPBC Act (refer Chapter 13). No threatened species or MNES were identified within the Proposal site and the construction and operation of the Proposal would not directly impact biodiversity. As such, impacts on MNES are not predicted as part of the Proposal and consequently, no referral is required to the Commonwealth Department for the Environment for the Proposal.

5.3 State legislation

5.3.1 Environmental Planning and Assessment Act 1979

The NSW environmental planning and assessment framework is established by the EP&A Act and the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation), which sets out approval requirements and provides for the making of environmental planning instruments (EPIs), which in turn determine the relevant planning approval pathway for development in NSW.

Part 3 of the EP&A Act provides for the formation of EPIs, which can take the form of Local Environmental Plans (LEPs) or State Environmental Planning Policies (SEPPs). EPIs contain provisions that control the permissibility of development and identify when development approval is required.

Under the EP&A Act, development is assessed in the following relevant main categories:

- Part 4 Division 4.1 Section 4.1 - Development that does not require development consent, as specified by an EPI
- Part 4 Division 4.1 Section 4.2 - Development that requires development consent, as specified by an EPI
- Part 4 Division 4.7 Section 4.36 - Development that requires development consent, and is considered State significant development, as specified by an EPI.

The Proposal would be considered SSD under Clause 23 (waste and resource management facilities) of Schedule 1 of the SEPP (State and Regional Development), which refers to:

> *(3) Development for the purpose of resource recovery or recycling activities that handle more than 100,000 tonnes per year of waste.*

The relevant local planning instrument is the BLEP 2015. The Proposal site is zoned IN1 General Industrial under as shown in Figure 5-1. A “waste or resource management facilities” is permitted with consent under the BLEP 2015. Additionally, Division 23 of *State Environmental Planning Policy (Infrastructure) 2007* (ISEPP) permits the establishment and operation of a waste or resource management facility on land zoned IN1 General Industrial with consent.

The EPIs that are applicable to the Proposal include:

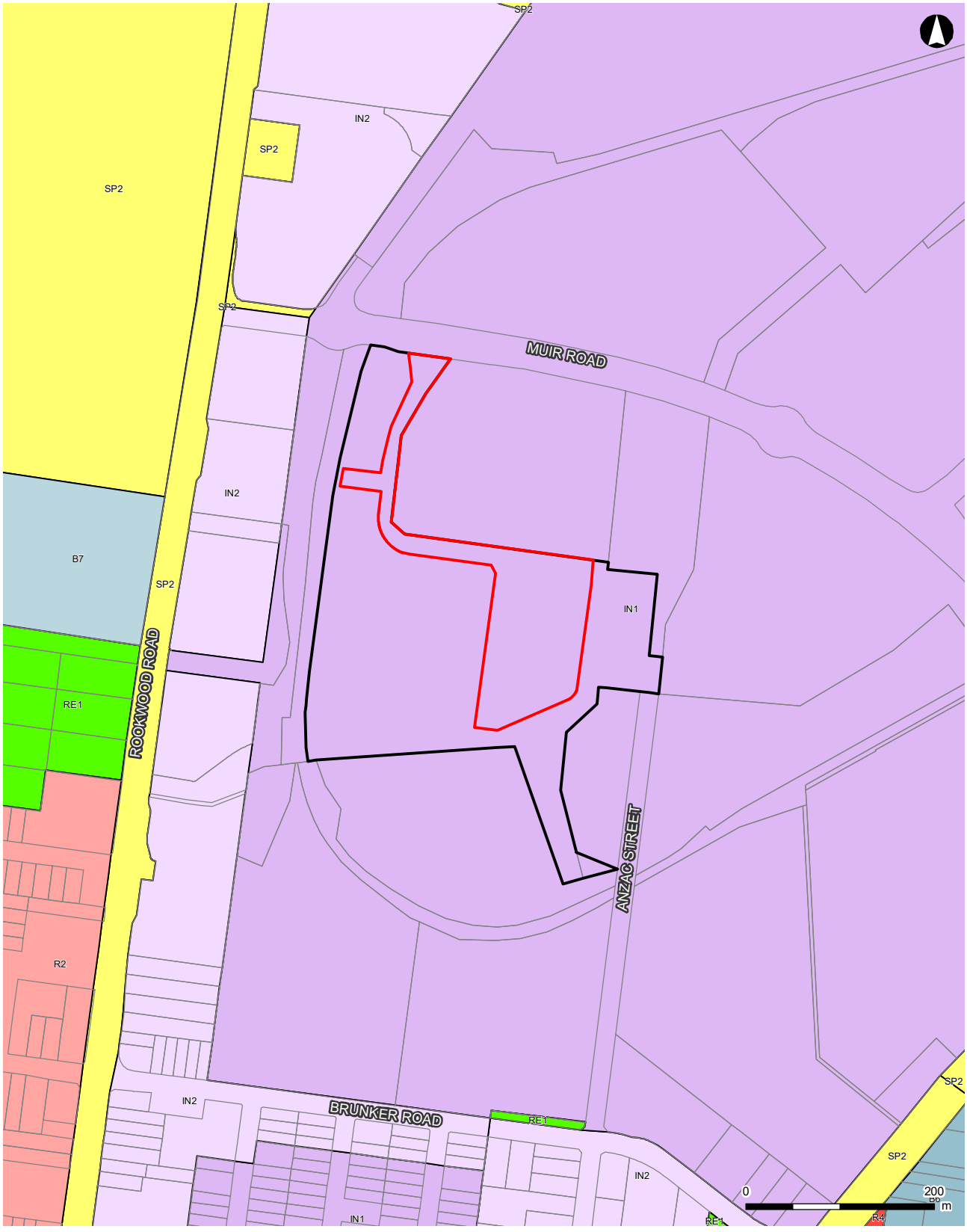
- SEPP (State and Regional Development)
- ISEPP
- *State Environmental Planning Policy No. 33 – Hazardous and offensive development* (SEPP 33)
- *State Environmental Planning Policy No. 55 – Remediation of land* (SEPP 55)
- *State Environmental Planning Policy No. 64 – Advertising and signage* (SEPP 64)
- BLEP 2015.

The applicability of each EPI to the Proposal is discussed in more detail in Section 5.4 and Section 5.5.

Section 4.15 of the EP&A Act identifies the matters for consideration that must be taken into account by a consent authority when determining a development application. An assessment of the compliance of this EIS with Section 4.15 of the EP&A Act is presented in Table 5-2.

Table 5-2 Assessment of compliance of this EIS with the matters for consideration in Section 4.15 of the EP&A Act

Matters for consideration	Where addressed in EIS
(1) In determining a development application, a consent authority is to take into consideration such of the following matters as are of relevance to the development the subject of the development application: (a) the provisions of: (i) any environmental planning instrument	Section 5.4 and Section 5.5
(ii) any proposed instrument that is or has been the subject of public consultation under this Act and that has been notified to the consent authority (unless the Secretary has notified the consent authority that the making of the proposed instrument has been deferred indefinitely or has not been approved)	Where relevant throughout Chapter 5
(iii) any development control plan	Section 5.5.2
(iiia) any planning agreement that has been entered into under section 7.4, or any draft planning agreement that a developer has offered to enter into under section 7.4	NA
(iv) the regulations (to the extent that they prescribe matters for the purposes of this paragraph)	Where relevant throughout Chapter 5
(v) (Repealed)	NA
(b) the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality	Where relevant throughout Chapters 7 to 19
(c) the suitability of the site for the development	Section 24.2.3
(d) any submissions made in accordance with this Act or the regulations	NA
(e) the public interest	Section 24 and throughout Chapters 7 to 19



LEGEND

- Chullora RRP site boundary
- Proposal site
- Property boundary

Zoning (Bankstown LEP 2015)

- B6 Enterprise Corridor
- B7 Business Park
- IN1 General Industrial
- IN2 Light Industrial
- R2 Low Density Residential
- R4 High Density Residential
- RE1 Public Recreation
- SP2 Infrastructure

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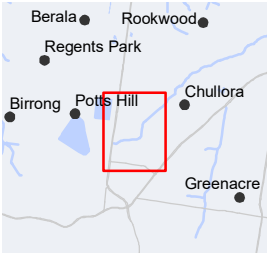


Figure 5-1: Proposal site zoning under BLEP 2015

5.3.2 Protection of the Environment Operations Act 1997

The *Protection of the Environment Operations Act 1997* (POEO Act) is the key piece of environmental protection legislation administered by the EPA. The principle objectives of the POEO Act are to:

- Protect, restore and enhance the quality of the environment, while having regard to the principles of ESD
- Provide increased opportunities for public involvement and participation in environment protection
- Reduce risks to human health and prevent the degradation of the environment
- Assist in the achievement of the objectives of the WARR Act.

Environment Protection Licence

Under the POEO Act, activities that will or are likely to cause pollution are identified as scheduled activities and require an EPL, which are issued and administered by the NSW EPA. These activities are set out in Schedule 1. The Proposal would be a Scheduled Activity as per Schedule 1 of the POEO Act and would consequently require an EPL under Section 48 of the POEO Act.

Scheduled activities which apply to the Proposal are outlined in Table 5-3, with the relevant EPL triggers for each activity. The Proposal would trigger an EPL requirement for waste processing (non-thermal treatment) and waste storage.

The previous Chullora RRC holds EPL 5893 which authorises a number of scheduled activities including, composting, recovery of general waste, and waste storage. The existing EPL could either be updated via a variation application or a new one sought for the Proposal.

Table 5-3 Applicable scheduled activities under the POEO Act

Clause	Activity type	Description	Relevant criteria
Clause 41	Waste processing (non-thermal treatment)	The receiving of waste (other than hazardous waste, restricted solid waste, liquid waste or special waste) from off site and its processing, otherwise than by thermal treatment.	The Proposal site is located within a regulated area as defined in the POEO Act. The criteria triggered by the Proposal for waste processing (non-thermal treatment) is therefore: • Has on site at any time more than 1,000 t or 1,000 m^3 of waste, or, processes more than 6,000 t of waste per year.
Clause 42	Waste storage	The receiving from off site and storing (including storage for transfer) of waste.	The Proposal site is located within a regulated area as defined in the POEO Act. The criteria triggered by the Proposal for waste storage is therefore: • Has on site at any time more than 1,000 t or 1,000 m^3 of waste, or, receives more than 6,000 t of waste per year.

Records of waste

Section 88 of the POEO Act requires licensed waste facilities in the regulated area of NSW to pay a contribution to the EPA for each tonne of waste received at the facility, referred to as the 'waste levy'. The purpose of the levy is to reduce the amount of waste being disposed of and to promote recycling and resource recovery. The levy liability for EPA-licensed waste processing, recovery and storage facilities applies to all waste received at a facility, as follows:

- A liability is activated when waste is received
- The liability is extinguished once the waste is sent offsite for lawful recycling, reuse or disposal

- The liability becomes payable when:
  - Waste is stockpiled at the facility for more than 12 months, unless it has been processed at the facility to a standard required by a resource recovery order
  - Waste is stockpiled above lawful limits
  - Waste transported from the facility is unlawfully disposed of.

All waste entering eligible sites (including the Proposal site) became liable for the levy as of 1 August 2015. Records must be kept in order to accurately determine how much waste moves through a facility. Liable facilities are required to report to the EPA on a monthly basis.

The Proposal would have three weighbridges (two-inbound and one outbound) through which all heavy vehicles delivering waste would pass. All heavy vehicles, regardless of entry purpose would be recorded at one of the two entry weighbridges. Once heavy vehicles have deposited or collected waste at the MRF, they would pass through the outbound weighbridge where they would be weighed before exiting the site. The tare weight would be subtracted from the gross weight of heavy vehicles to determine the mass of waste being transferred to and from the MRF.

Environment protection offences

The POEO Act establishes a range of pollution offences and penalties that are applicable to all activities undertaken on a site. Specific pollution offences are created for actions associated with:

- Water pollution
- Air pollution
- Noise pollution
- Land pollution
- Littering and waste.

The POEO Act also establishes a number of regulations that provide further details on the management of pollution. Construction and operation of the Proposal would be undertaken in a manner that achieves compliance with the requirements of the POEO Act and its regulations. Procedures to prevent pollution during construction would be documented in a CEMP. Operational controls would be detailed in an OEMP.

Pollution Incident Response Management Plans (PIRMP) would be implemented and would include construction and operation of the Proposal in accordance with the requirements of Part 5.7A of the POEO Act and the *Protection of the Environment Operations (General) Regulation 2009*.

5.3.3 Protection of the Environment Operations (Clean Air) Regulation 2010

The *Protection of the Environment Operations (Clean Air) Regulation 2010* prescribes emission concentration limits which apply to industries. Under the regulation, the Proposal would fall under the ambit of the 'Group 6 emission concentration limits', which are the most stringent limits under the regulation.

An assessment of air quality in Chapter 8 has identified that the Proposal would have negligible impacts on air quality during construction and operation, complying with the relevant criteria levels for combustion gasses, volatile organic compounds, dust and odour. The Proposal would not contribute any additional (above background existing levels) days where particulate matter exceeds criteria (refer Section 8.6 for additional detail).

5.3.4 Protection of the Environment Operations (Waste) Regulation 2014

The *Protection of the Environment Operations (Waste) Regulation 2014* (POEO (Waste) Regulation) requires tracking of certain waste within NSW and between participating states. Each party must be authorised to store, transport, or receive the specific type of waste. Schedule 1 of the Regulation identifies the types of waste which apply. In addition, the Regulation has specific reporting and record-keeping requirements. It is an offence under the POEO Act to wilfully or negligently dispose of waste in a manner that harms or is likely to harm the environment.

The POEO (Waste) Regulation also prescribes the requirements for recording information relating to:

- The delivery of waste or other material at scheduled waste facilities
- Loads of waste or other material transported from the facility for use, recovery, recycling, processing or disposal at another place
- Other vehicles entering the facility for a purpose related to the operation of the facility.

The Proposal would meet the requirements of record-keeping and reporting under the POEO (Waste) Regulation (refer Section 4.5.7 for further detail).

Clause 15 of the regulation requires scheduled premises that receive more than 10,000 tpa of waste to install a weighbridge to ensure that the quantity of waste being transported to and from the site is correctly recorded. As the Proposal would process up to 172,000 tpa of materials, a weighbridge would be required. The Proposal would include the use of three weighbridges (two for incoming and one for outgoing heavy vehicles). Weighbridges at the Proposal site would be operated and maintained in accordance with the requirements of the POEO (Waste) Regulation to accurately record waste transported to and from the Proposal site.

5.3.5 Waste Avoidance and Resource Recovery Act 2001

The importance of responsible resource management, including maximisation of the utility of resources and associated minimisation of disposal to landfill is highlighted in the WARR Act. The WARR Act is the principle piece of legislation governing waste and resource management in NSW, and objectives of the Act include:

- Encouraging the most efficient use of resources
- Reducing environmental harm
- Ensuring that resources are managed against the waste hierarchy of avoidance, resource recovery, and then disposal
- Diversion of waste from landfill
- Ensuring industry takes part in reducing and dealing with waste
- Achieving integrated, state-wide waste and resource management planning and service delivery.

As discussed in Chapter 3 the Proposal is consistent with current waste management and recovery principles specified in local, regional and state strategies. The Proposal would form a key piece of waste infrastructure for enabling Sydney to achieve and promote the objectives of the WARR Strategy, achieving an increased recycling rate and increased diversion of waste to landfill. Furthermore, the Proposal would promote resource recovery and diversion of waste to landfill and most importantly deliver on the principles of a circular economy. The Proposal is therefore considered consistent with the WARR Strategy.

5.3.6 Contaminated Land Management Act 1997

The general intention of the *Contaminated Land Management Act 1997* (CLM Act) is to establish a process for investigating and (where appropriate) remediating the land that the EPA considers to be contaminated significantly enough to require regulation.

Section 5 of the CLM Act defines the contamination of land as:

The presence in, on or under the land of a substance at a concentration above the concentration at which the substance is normally present in, on or under (respectively) land in the same locality, being a presence that presents a risk of harm to human health or any other aspect of the environment (CLM Act, s5).

A search of the CLM Act Register was undertaken on 17 October 2019 which revealed the Proposal site is not listed as contaminated land. Potential contamination has been identified within the Chullora RRP site during previous inspections, however following implementation of a site remediation action plan in 2016 the Proposal site was deemed suitable for commercial / industrial use (Enviroview Pty Ltd, 2016) (NSW EPA, 2016a).

Any potentially contaminated lands will have been excavated or capped as part of the proposed flood mitigation works (DA 366/2020) prior to the commencement of the Proposal and subsequently would not be disturbed by the Proposal. The Proposal includes establishing of a permanent hard stand area across the entire Proposal site which would mitigate disturbance to sub surface soil, eliminate erosion and sedimentation risks and minimise the risk of accidental spills and leaks causing contamination during construction and operation.

Chapter 10 provides further detail on contamination and identifies measures that should be implemented should areas of potential environmental concern be disturbed.

5.3.7 Roads Act 1993

The *Roads Act 1993* (Roads Act) governs activities in, on under or over a public road. This Act is governed by Transport for NSW (TfNSW), the local council or the NSW Land and Property Management Authority depending on the road classification. TfNSW has authority over classified roads, and the local council over local roads. Upgrades to both entrances at Muir Road and Anzac Street have recently been completed. Only minor works (e.g. installation of signage) would be required adjacent to the two site entrances and no works would need to be undertaken within a public road reserve. As such, approval under the Roads Act would not be required.

5.3.8 Water Management Act 2000

The object of the *Water Management Act 2000* (WM Act) is to provide for the sustainable and integrated management of the water sources of the State for the benefit of both present and future generations. The WM Act provides for the preparation of water sharing plans that set extraction limits and rules for water access, available water determinations, account management and trading in order to protect water sources and their dependent ecosystems, whilst recognising the social and economic benefits of the sustainable and efficient use of water (Aquifer interference policy).

Licences under the WM Act are required for interception of any aquifer underlying the Proposal site and for groundwater extraction. Extraction or interception with waterways or groundwater is not proposed as part of the Proposal. The Proposal includes minimal ground disturbance, and instead would involve construction a permanent hardstand across an already established earthworks platform.

Further information about potential impacts to surface and groundwater from the Proposal is provided in Chapter 9.

5.4 State and regional environmental planning policies

5.4.1 State Environmental Planning Policy (State and Regional Development) 2011

SEPP (State and Regional Development) identifies classes of development and determines whether a development is classified as SSD under Part 4 of the EP&A Act. This SEPP identifies the thresholds for waste and resource management facilities, along with other development types, to be classified as SSD.

The aims of the SEPP (State and Regional Development) are:

- To identify development that is SSD
- To identify development that is State significant infrastructure (SSI) and critical SSI
- To confer functions on joint regional planning panels to determine development applications.

Under Clause 23, Schedule 1 of SEPP (State and Regional Development) the Proposal is considered to be:

> *development for the purpose of resource recovery or recycling facilities that handle more than 100,000 tonnes per year of waste.*

The development is therefore classified as SSD and is assessable under Part 4, Division 4.7 of the EP&A Act.

Under Clause 11 of the SEPP (State and Regional Development), development control plans (DCPs), developed under LEPs, are not applicable to SSD.

5.4.2 State Environmental Planning Policy (Infrastructure) 2007

The applicable aim of the ISEPP are:

> *to facilitate the effective delivery of infrastructure across the State by:*
>
> *(f) providing for consultation with relevant public authorities about certain development during the assessment process or prior to development commencing.* (ISEPP, Cl 2)

Clause 121 of the ISEPP makes provision for waste or resource management facilities to be undertaken, with development consent within a 'prescribed zone' which includes the IN1 General Industrial zone. The subject site is zoned IN1 General Industrial under the BLEP 2015. Therefore, the proposed development would be considered permissible with development consent.

Schedule 3 of ISEPP classifies all waste or resource management facilities as traffic generating developments. Under Clause 104 of ISEPP, all waste traffic generating developments, including recycling facilities, must be referred to TfNSW. The consent authority must take into consideration:

- *Any submission that TfNSW provides in response to the application within 21 days after the notice was given (unless, before the 21 days have passed, TfNSW, advises that it will not be making a submission), and*
- *The accessibility of the Site, including:*
  - *The efficiency of movement of people and freight to and from the site and the extent of multi-purpose trips; and*
  - *The potential to minimise the need for travel by car and to maximise the movement of freight in containers or bulk freight by rail; and*
- *Any potential traffic safety, road congestion or parking implications of the development.*

  (ISEPP, Cl 104)

An assessment of traffic impacts has been undertaken to investigate, identify and address any potential impacts to traffic from the Proposal. The construction and operation of the Proposal is not

anticipated to have a significant impact on the surrounding road network. Traffic generated by the Proposal is not expected to compromise the safety or function of the surrounding road network. Traffic impacts are assessed in the TIA provided in Appendix J and discussed in further detail in Chapter 7. Consultation has been undertaken with TfNSW during the preparation of this EIS.

5.4.3 State Environmental Planning Policy No.33 – Hazardous and offensive development

SEPP 33 links the permissibility of an industrial development to its safety and environmental performance. Certain activities may involve handling, storing or processing a range of materials, which, in the absence of controls, may create risk outside of operational borders to people, property or the environment. Such activities would be defined by SEPP 33 as a 'potentially hazardous industry' or 'potentially offensive industry'. SEPP 33 applies to any industrial development proposals which fall within these definitions.

Under Clause 3, a development is deemed part of a potentially hazardous industry if it satisfies the definition:

> *"a development for the purposes of any industry which, if the development were to operate without employing any measures (including, for example, isolation from existing or likely future development on other land) to reduce or minimise its impact in the locality or on the existing or likely future development on other land, would pose a significant risk in relation to the locality:*
>
> *a) to human health, life or property, or;*
>
> *b) to the biophysical environment;*
>
> *and includes a hazardous industry and a hazardous storage establishment."*

A development is deemed part of a potentially offensive industry if it satisfies the following definition:

> *"a development for the purposes of an industry which, if the development were to operate without employing any measures (including, for example, isolation from existing or likely future development on other land) to reduce or minimise its impact in the locality or on the existing or likely future development on other land, would emit a polluting discharge (including for example, noise) in a manner which would have a significant adverse impact in the locality or on the existing or likely future development on other land, and includes an offensive industry and an offensive storage establishment."*

The Department of Planning ((DoP) (2011) guideline *Applying SEPP 33* provides a risk screening procedure to facilitate determination of whether a proposed development is considered a potentially hazardous or offensive development. If SEPP 33 is triggered under this screening test, Clause 12 of SEPP 33 requires Preliminary Hazard Analysis (PHA) to be carried out by a suitably qualified person.

As the Proposal falls within the definition of a "potentially hazardous industry" or a "potentially offensive industry", a screening analysis was undertaken, which is outlined in Section 12.2.2. The risk screening determined that, while chemicals and dangerous goods would be stored within the Proposal site, quantities would not be sufficient to trigger the requirement for a PHA. Furthermore, as the Proposal would be constructed on a prepared earthworks foundation, raised above the 1:100 ARI flood level, and would involve minimal disturbance to soils and no interaction with groundwater, there are minimal existing hazards to consider. Potential operational hazards will be mitigated through the preparation of an OEMP, including a PIRMP which is further discussed in Section 12.6.

5.4.4 State Environmental Planning Policy No. 55 – Remediation of land

The objective of SEPP 55 is to provide for a coordinated state-wide planning approach for the remediation of contaminated land. SEPP 55 aims to promote the remediation of contaminated land with the objective of reducing the risk of harm to human health or other aspects of the environment.

Clause 7 of SEPP 55 requires the approval authority to have regard to certain matters before granting approval. These matters include:

- Whether the land is contaminated
- Whether the land is, or would be, suitable for the purpose for which development is to be carried out
- If remediation is required for the land to be suitable for the proposed purpose, whether the land will be remediated before the land is used for that purpose.

SEPP 55 also imposes obligations to carry out any remediation work in accordance with relevant guidelines, developed under the CLM Act (discussed above) and to notify the relevant council of certain matters in relation to any remediation work.

Potential contamination has been identified within the Chullora RRP site during previous inspections, however following implementation of a site Remedial Action Plan (RAP) in 2016 the Proposal site was deemed suitable for commercial / industrial use (Enviroview, 2016) (NSW EPA, 2016a).

Any potentially contaminated lands will have been excavated or capped as part of the proposed flood mitigation works (DA 366/2020) prior to the commencement of the Proposal and subsequently would not be disturbed by the Proposal. The Proposal includes establishing a permanent hard stand area across the entire Proposal site which would mitigate disturbance to sub-surface soil, eliminate erosion and sedimentation risks and minimise the risk of accidental spills and leaks causing contamination during construction and operation.

5.4.5 State Environmental Planning Policy No. 64 – Advertising and signage

SEPP 64 aims to regulate signage to ensure that it is compatible with the visual character of an area and provides effective communication in suitable locations. SEPP 64 is applicable to all signage, except for signage that is classified as ‘exempt development’ under an EPI.

Signage would be installed at the Proposal site for the purposes of business identification, provision of occupational health and safety information and directing visitors and waste vehicles around the site. All signage would be developed in accordance with AS 1319-1994 and AS 4282-1997. Overall, the Proposal is considered consistent with the objectives of SEPP 64 (Clause 3) in that, the signage would be compatible with the surrounding area, provides suitable communication for wayfinding and would be of high design quality. An indicative design of the proposed signage is shown in Figure 5-2. The location and scale of signage on the MRF building is shown in the artistic impressions provided in Section 4.3.4.



Figure 5-2 Indicative site signage (left: MRF signage; right: site entrance signage

An assessment of the Proposal having regard to the assessment criteria provided in SEPP 64 (Schedule 1) is provided in Table 5-4. Further details on signage for the Proposal can be found in Section 4.3.4 and Appendix E.

Table 5-4 SEPP 64 (Schedule 1) Assessment

Consideration	Compliance
Character of the area	The surrounding area is predominantly industrial in nature containing buildings with business identification signage and some advertising. Signage has been designed to integrate into the surrounding area with the assistance of discrete selection of materials and finishes and the appropriate placement of signage.
Special areas	The signage to be installed as part of the Proposal has been designed to ensure it would not detract from the amenity or visual quality of any environmentally sensitive areas, heritage areas, natural or other conservation areas, open space areas, waterways, rural landscapes or residential areas near the Proposal site.
Views and vistas	The proposed signage would not impact on any existing views or dominate the skyline in the area. Signage is proposed to be located on the northern face of the MRF shed, on the eastern side of the MRF shed (adjacent to the pedestrian bridge) and at the Muir Road and Anzac Street entrances. The signage has been designed to integrate into the surrounding area as a result of landscaping and suitable materials and finishes.
Streetscape, setting or landscape	The signage has been designed to create visual interest and be of appropriate scale and design for the surrounding industrial area.
Site and building	The signage to be installed as part of the Proposal has been designed to a scale that is reflective and consistent with the proposed buildings and structures to be located on the Proposal site. The signage would not detract from these buildings and/or infrastructure.
Associated devices and logos with advertisements with advertising structures	Way finding signs to be incorporated into the Proposal have been designed to improve access to, from and within the site. This signage has been located in clearly visible areas to improve safety and maximise efficiency.
Illumination	Signage associated with the Proposal will be appropriately illuminated. The illumination would not detract from the signage and would be consistent with the surrounding industrial area.
Safety	Overall, the signage proposed has been designed to improve access to, from and vehicle movements within the Proposal site, thereby improving safety of vehicle and pedestrian movements.

5.5 Local Environmental Plan and Development Control Plan

5.5.1 Bankstown Local Environment Plan 2015

The Proposal site is located on land within the Canterbury-Bankstown LGA and is subject to the provisions of the BLEP 2015. A summary of the compliance of the Proposal with the objectives of the BLEP 2015 is provided in Table *5-5*.

Table 5-5 Compliance of the Proposal with the aims of the BLEP 2015

Objective	Comment	Complies?
To manage growth in a way that contributes to the sustainability of Bankstown, and recognises the needs and aspirations of the community	The Proposal would provide a sustainable resource recovery facility that would divert waste from landfill. It would also, implement best practice design features and mitigation measures to minimise the impact of the Proposal on the environment.	Yes
To protect and enhance the landform and vegetation, especially foreshores and bushland, in a way that maintains the biodiversity values and landscape amenity of Bankstown	The Proposal would not remove any vegetation or directly impact any biodiversity features. The EEC identified in the northwest of the Chullora RRP would be established as a conservation area. Landscaping would be retained across the Chullora RRP site to maintain landscape amenity and provide screening, where necessary.	Yes
To protect the natural, cultural and built heritage of Bankstown	No direct impacts would occur to natural assets or known items of Aboriginal or non-Aboriginal heritage significance from the Proposal. The Proposal would minimise the impact it has on the natural, cultural and heritage of the Proposal site and in the immediate locality with the implementation of appropriate mitigation measures.	Yes
To provide development opportunities that are compatible with the prevailing suburban character and amenity of residential areas of Bankstown	Not relevant	N/A
To minimise risk to the community in areas subject to environmental hazards by restricting development in sensitive areas	The Proposal would minimise the risk of environmental hazards to the Proposal with the implementation of best mitigation measures including an Emergency Response Plan, Incident Response Plan and fire emergency procedure.	Yes

Objective	Comment	Complies?
To provide a range of housing opportunities to cater for changing demographics and population needs	Not relevant	N/A
To provide a range of business and industrial opportunities to encourage local employment and economic growth	The Proposal would provide employment for up to 30 FTE positions at a time over the 12 month construction period). During operation, the facility would employ up to 45 FTE positions. The Proposal would also provide capital investment in the region of up to $54 million, creating the potential for sourcing Proposal resources from regional providers, suppliers and subcontractors.	Yes
To provide a range of recreational and community service opportunities to meet the needs of residents of and visitors to Bankstown	The Proposal would provide a resource recovery facility to receive local kerbside co-mingled recyclables for recovery and beneficiation.	Yes
To achieve good urban design in terms of site layouts, building form, streetscape, architectural roof features and public and private safety	The design of the Proposal would take into consideration the BLEP 2015 requirements of the Chullora Business Park. The Proposal would be designed to maximise the site layout. Materials and finishes (presented in Appendix E) have considered the surrounding urban landscape and are of a high quality.	Yes
To concentrate intensive trip-generating activities in locations most accessible to rail transport to reduce car dependence and to limit the potential for additional traffic on the road network	Not relevant	N/A
To consider the cumulative impact of development on the natural environment and waterways and on the capacity of infrastructure and the road network	The Proposal would incorporate best practice environmental performance and mitigation measures that would help to protect the cumulative impacts on the natural environment.	Yes
To enhance the quality of life and the social well-being and amenity of the community	The Proposal would provide a facility that recovers recyclables that have been diverted from landfill.	Yes

The compliance of the Proposal with the objectives of Zone IN1 – General Industrial of the BLEP 2015 is provided in Table 5-6.

Table 5-6 Compliance of the Proposal with the objectives of Zone IN1 – General Industrial of the BLEP 2015

Objective	Comment	Complies?
To provide a wide range of industrial and warehouse land uses.	The Proposal would provide a MRF for resource recovery purposes.	Yes
To encourage employment opportunities.	The Proposal would provide employment for up to 30 full time equivalent positions at a time over the 12 month construction period. During operation, the facility would employ 45 FTE positions.	Yes
To minimise any adverse effect of industry on other land uses.	The design of the Proposal has been developed to minimise any impacts to the predominantly industrial land uses surrounding the site and the adjoining land uses.	Yes
To support and protect industrial land for industrial uses.	The Proposal is ideally situated within an existing industrial precinct. The Proposal would improve the utilisation of the site and support the on-going economic viability of the industrial precinct.	Yes

The compliance of the Proposal with the requirements of the BLEP 2015 is provided in Table 5-7.

Table 5-7 Proposal's compliance with the BLEP 2015

Consideration	Comments	Complies?
Zoning (land use table) The Proposal site is located in zone IN1 – General Industrial	The Proposal is permitted with consent under the BLEP 2015.	Yes
Height of Buildings (Clause 4.3) There is no maximum building height set for the Proposal site	The buildings included in the Proposal are a maximum of 12.3 m which is considered suitable to the surrounding context.	N/A
Floor Space Ratio (Clause 4.4) The maximum floor space ratio is 1:1 for the Proposal site	The Proposal site includes a floor space ratio of 0.12:1	Yes
Exceptions to development standards (Clause 4.6) Exemptions to certain development standards are permitted subject to special circumstances	N/A	N/A

Consideration	Comments	Complies?
Heritage conservation (Clause 5.10) Development consent is required for the demolition, removal or altering of a place of Aboriginal significance or heritage item	The Proposal site contains no heritage items listed in the BLEP 2015.	Yes
Biodiversity (Clause 6.4) The Proposal site is mapped as "Biodiversity" on the Terrestrial Biodiversity Map	A portion of the Proposal site is mapped as 'Biodiversity' on the Terrestrial Biodiversity Map. However, no vegetation or biodiversity features would be directly impacted as a result of the development. A 0.44 ha patch of TEC is located in the north-western corner or Chullora RRP, adjacent to the Proposal site, which would be retained as a conservation area.	Yes

The Proposal is considered to be generally consistent with the controls of BLEP 2015.

5.5.2 Bankstown Development Control Plan 2015

The Bankstown Development Control Plan 2015 (Bankstown DCP) supports the BLEP 2015 by providing more detailed controls that apply to the Canterbury-Bankstown LGA. As the Proposal is SSD, the provisions of the Bankstown DCP do not apply. However, consideration has been given to the objectives of the Bankstown DCP in order to demonstrate consistency of the Proposal with the overarching aims of Canterbury-Bankstown Council for the Proposal site and the surrounding area. General provisions of the Bankstown DCP include:

- Sustainable development
- Industrial precincts
- Parking
- Tree preservation
- Flood management
- Waste management and minimisation.

The Proposal is considered to be generally compliant with provisions regarding sustainable development, parking, tree preservation, flood management and waste management and minimisation (refer Table 5-8).

The Bankstown DCP requires the Proposal to have one car parking space per 100 m^2 for mezzanine floor space where mezzanine floor space does not exceed 20 per cent of gross floor area of the unit. The Proposal is proposed to have a Gross Floor Area (GFA) of 9,886.2 m^2, which would result in a parking requirement of approximately 100 car parking spaces. Given that the Proposal is anticipated to have 30 full-time employees working on the MRF at any one time, this requirement is considered to be excessive, and the car parking provision has been determined to be more appropriately measured based on the number of employees at any one time required to perform the required duties at the Proposal site. The Chullora RRP site currently contains 70 car parking spaces which is considered sufficient for the parking demand requirements of the Proposal. This is further considered in Section 7.5.5.

Table 5-8 Proposal's consistency with the Bankstown DCP – Industrial Development

Aspect	Summary of Requirement	Comment	Compliance?
B3 2.1 Site coverage	The sum of the site coverage on the allotment must not exceed 70% of the site area	The site coverage equates to approximately 45%, therefore not exceeding the criteria.	Yes
B3 2.2 – 2.3, 3.17 Building setbacks and landscape	The setbacks for the development should be: • To the primary road frontage- 10 m • To the secondary road frontage – 3 m • To the railway corridor and open stormwater drain – 1.5 m.	The site plan and design of the Proposal has ensured the maximum possible setbacks which would optimise the operational efficiency of the Proposal. The MRF would be set back: • 220 m from the primary road frontage (Muir Road) • 100 m from the secondary frontage (Anzac Street) • A minimum of 20 m from the Cooks River stormwater canal • 150 m from the disuse rail siding to the west of the Proposal site	Yes
B3 3.1, 3.6, 3.10 Facades and roof	Development must use quality materials such as brick, glass, and steel to construct the façade Development must incorporate innovative roof design using high quality materials and finishes	The buildings and structures of the Proposal would be of a high design quality. Building colours and finishes would be compatible and blend with surrounding land uses, including non-reflective colours. The exterior of the MRF shed would comprise a navy blue and grey Colorbond cladding with painted charcoal concrete tilt up walls.	Yes
B3 3.17 Safety and security	Where development shares allotment with railway corridor and open stormwater drain, setback should be minimum of 1.5m and screened using vegetation	The MRF would be set back: • A minimum of 20 m from the Cooks River stormwater canal • 150 m from the disuse rail siding to the west of the Proposal site	Yes
B3 4.3, 4.6-4.8 Landscaping	A number of requirements relating to landscaped areas.	The existing Chullora RRP site comprises an extensive landscaping area in the southern portion of the site. This area, as well as the vegetated area in the north-western portion of the Chullora RRC would be	Yes

Aspect	Summary of Requirement	Comment	Compliance?
		retained to provide a visual buffer into the Proposal site.	
B3 5.1 Fencing	Fence height and material requirements	The Proposal site comprises existing security fencing which would be retained. The Chullora RRP site fencing with adjacent property (PFD) has recently been upgraded and no further changes are proposed	N/A
B3 6.6 Signage	All signs must: • consist of a corporate sign (giving identity to a structure or place), a directory sign (at each entrance), or a unit sign (giving business name and contact details) • locate at pedestrian level • limit a unit sign to one sign per until with a maximum area of 3 m x 1 m	The signage of the Proposal has been designed to be compatible with the surrounding area, provide suitable communication for wayfinding and be of a high design quality.	Yes
B3 7.18 Building design	A number of requirements relating to architectural features, external finishes, universal design to ensure that all development is of a high standard of urban form.	The buildings and structures of the Proposal would be of a high design quality. Building colours and finishes would be compatible and blend with surrounding land uses, including non-reflective colours.	Yes
B3 6.3-6.4 Drainage	Drainage works on site must provide an upgraded stormwater system to retard flows (in comparison to pre-development conditions) and collect gross pollutants that may be detrimental to the Cooks River	Chapter 9 and Appendix L of the EIS provide a water and hydrology impact assessment and stormwater management plan, which includes the Proposal site drainage.	Yes
B4 2.2 (W2) Water Management	A number of requirements related to the need for a water management plan, stormwater detention systems, rainwater tanks and water sensitive urban design.	Chapter 9 and Appendix L of the EIS provide a water and hydrology impact assessment and stormwater management plan.	Yes
B4 3.2 (E1) Greenhouse gas emissions	Energy minimisation measures to be considered including energy efficient	A CEMP and OEMP will be prepared for the Proposal to minimise greenhouse gas	Yes

Aspect	Summary of Requirement	Comment	Compliance?
	lighting, air conditioning and hot water	(GHG) emissions impacts, which will include: • Inclusion of energy efficient design aspects • Machinery selection consideration • Consideration of energy efficient materials and appliances.	
B4 Parking	Off street parking requirements include one car space per 100 m^2 of gross floor area and one car space for people with disabilities per 100 car spaces provided	The Chullora RRP allows for the provision of 70 car spaces, which is considered sufficient for the parking demand requirements of the Proposal and includes two disability access parking spaces.	No. The DCP requires only 100 parking spaces. Following the parking assessment for the Proposal 70 parking spaces was considered sufficient for the parking demand requirements of the Proposal. Refer to Section 7.5.5 for more details on parking.
B13 1.1, 4.1 - 4.9 Waste Management	A waste management plan must be prepared for the Proposal as well as detailed requirements regarding waste and storage collection areas.	A waste management impact assessment was undertaken which concluded that the Proposal would produce small quantities of waste. A CEMP, or equivalent will be prepared to minimise waste related impacts, which will include: • Waste prioritisation information • Waste management protocols • Induction and training procedures to staff and sub-contractors	Yes

Conclusion

There are a number of relevant legislation and planning instruments applicable to the Proposal at the Commonwealth, national, state and local levels. The Proposal is considered SSD under Clause 23 (waste and resource management facilities) of schedule 1 of the SEPP (State and Regional Development). The planning, design, construction and operation of the Proposal is compliant with the applicable requirements of each Act and planning instruments.

6 CONSULTATION

Summary

SUEZ have prepared a Community and Stakeholder Participation Strategy (CSPS) to outline their approach to consultation during the delivery of the Proposal. The CSPS is provided in Appendix I of this EIS. The CSPS contains a number of consultation objectives which reflect SUEZ' commitment to listening and engaging with the community and key stakeholders of the Proposal to identify and address any concern. The consultation approach outlined in the CSPS focuses on two key stakeholder groups; government agencies and the community.

A number of government agencies have been actively consulted with throughout the preparation of the EIS, including:

- DPIE, including multiple Groups within DPIE
- NSW EPA
- FRNSW
- TfNSW (including the former Roads and Maritime Services)
- Council
- Sydney Water.

These agencies have been consulted via face-to-face meetings, email and telephone correspondence, letter correspondence, site visits and provision of draft report content for review. Aspects raised by government agencies largely focused on the fire design of the Proposal, as well as other aspects such as hazards and risk, contamination and flood storage; each of which have been addressed within this EIS. A number of design refinements have been made to the Proposal in response to stakeholder feedback, largely in relation to the fire systems design for the Proposal.

The Proposal site is located within an industrial area of Chullora and is surrounded by industrial land uses. The closest residential receivers are approximately 455 m to the southwest and 600 m to the east of the site and residences are not visually exposed. Further, the Proposal site has a long history of use as a waste management facility. Given the location, nature and historic use of the Proposal site the key community stakeholders were identified as being property and business owners within the surrounding suburb. Consultation activities had originally intended to include door knocking within the surrounding suburb to provide neighbouring and nearby properties with an overview of the Proposal and to seek their feedback. Due to COVID-19 and government social-distancing recommendations, it was subsequently considered more appropriate to limit consultation activities to virtual and printed mediums, comprising:

- A community information mail-out
- Follow up direct correspondence (via telephone and email) with neighbouring and nearby property and business owners
- A feedback survey
- A dedicated Proposal website.

Only one response was received via the above consultation activities, which noted no major concerns with the Proposal. The Proposal website was viewed 66 times, with an average time spent on the website of 3 minutes, 42 seconds.

Further consultation will be undertaken by SUEZ during the exhibition of the EIS and the future delivery of the Proposal.

6.1 Introduction

SUEZ have prepared a Community and Stakeholder Participation Strategy (CSPS) to outline their approach to consultation during the delivery of the Proposal and to address the SEARs issued by DPIE. The CSPS is provided in Appendix I of this EIS. Provides a summary of the relevant SEARs which relate to consultation, and where these have been addressed in this EIS.

Table 6-1 SEARs (consultation)

SEARs	Where Addressed
Community and Stakeholder Engagement	
A detailed community and stakeholder participation strategy which identifies who in the community has been consulted and a justification for their selection, other stakeholders consulted and the form(s) of the consultation, including a justification for this approach	Chapter 6 Appendix I CSPS
A report on the results of the implementation of the strategy including issues raised by the community and surrounding landowners and occupiers that may be impacted by the Proposal	Chapter 6 Appendix I CSPS
Details of how issues raised during community and stakeholder consultation have been addressed and whether they have resulted in changes to the Proposal	Section 6.3.3 (agency consultation outcomes) Section 6.4.3 (community consultation outcomes) Section 6.7 (changes to the Proposal) Appendix I CSPS
Details of the proposed approach to future community and stakeholder engagement based on the results of the consultation.	Section 6.5 and Section 6.6 Appendix I CSPS
Consultation	
During the preparation of the EIS, you must consult with the relevant local, State or Commonwealth Government authorities, service providers, community groups and potentially affected landowners.	Section 6.3 (government agency consultation) Section 6.4 (community consultation) Appendix I CSPS
In particular you must consult with: • Department of Planning, Industry and Environment, specifically the: – Environment, Energy and Science Group (including the Climate Change and Sustainability Division) – Water Group.	Section 6.3
• Environment Protection Authority	Section 6.3
• Fire and Rescue NSW	Section 6.3
• Transport for NSW (including the former Roads and Maritime Services)	Section 6.3
• Canterbury-Bankstown Council	Section 6.3

SEARs	Where Addressed
• Sydney Water	Section 6.3
The EIS must describe the consultation process and the issues raised and identify where the design of the development has been amended in response to these issues. Where amendments have not been made to address an issue, a short explanation should be provided.	Section 6.2 (consultation process) Section 6.3.3 (agency consultation outcomes) Section 6.4.3 (community consultation outcomes) Section 6.7 (design refinements) Appendix I CSPS

6.2 Consultation strategy

SUEZ have prepared a CSPS which reflects their commitment to listening and engaging with the community and key stakeholders of the Proposal to identify and address any concerns. SUEZ recognises the importance of engaging with the community and key stakeholders throughout the planning process. SUEZ's communications objectives are to:

- Raise awareness of the Proposal and its merit
- Inform key stakeholders of the EIS lodgement and public exhibition
- Increase awareness of SUEZ' best practice waste and recycling operations
- Discuss and seek feedback from community members.

The following steps have been carried out to develop the CSPS and actively undertake consultation:

1. Identify key stakeholders with a potential interest in the Proposal
2. Identify appropriate consultation mediums tailored to those stakeholders
3. Generate consultation collateral to effectively portray information about SUEZ and the Proposal
4. Undertake the identified consultation activities and seek feedback on the Proposal
5. Address queries and concerns raised during consultation activities where possible
6. Identify next steps and future consultation activities.

The first step (stakeholder identification) broadly categorised key stakeholders into two groups; namely government agencies and community stakeholders. Section 6.3 and Section 6.4 describe the consultation activities and outcomes based on the steps above for each group respectively.

6.3 Government agency consultation

6.3.1 Stakeholder identification

Several government agencies were identified as having a likely interest in the Proposal. These agencies were identified through the SEARs issued by DPIE as well as an understanding of the agencies that may have an interest in specific aspects of the Proposal or particular environmental considerations. The agencies identified for consultation were:

- DPIE, including:
  - Environment, Energy and Science (EES) Group
  - Water Group
- NSW EPA

- FRNSW
- TfNSW (including the former Roads and Maritime Services)
- Council
- Sydney Water.

6.3.2 Consultation mediums and collateral

The consultation mediums adopted differed depending on the agency engaged with and the nature and level of their interest in the Proposal. Consultations mediums included:

- Face-to-face and virtual meetings
- Telephone conversations
- Email correspondence
- Letter correspondence
- Site visits
- Provision of reports for the purpose of seeking feedback.

The medium adopted for each agency is described in Section 6.3.2 below.

Due to the nature of the consultation activities carried out with Government agencies, consultation collateral was prepared on a customised basis and largely comprised of presentation material and preparation of bespoke letters and background information.

6.3.3 Consultation outcomes

A summary of the consultation activities carried out, the key aspects discussed, and how they been considered within this EIS and the development of the Proposal, is provided for each agency below.

Department of Planning, Industry and Environment

DPIE have been consulted with throughout the preparation of this EIS, regarding various elements of the Proposal. Consultation with DPIE has comprised the following activities:

- An initial Scoping meeting was held between SUEZ and DPIE on 13th November 2019
- A face-to-face meeting was held between SUEZ, DPIE, the EPA and FRNSW on 4th February 2020
- Multiple telephone conversations and email correspondences with representatives from the Industry and Assessment team have occurred throughout the development of the EIS.

Consultation with other departments within DPIE (namely EES Group and the Water Group) was carried out via letter correspondence. Bespoke letters were prepared and issued to each Group on 28th April 2020 providing them with background information regarding the Proposal, outlining how any items raised by each Group during the request of SEARs process had been addressed within the EIS, and inviting any further feedback from each Group. No response had been received from either Group at the time of EIS exhibition.

The key aspects raised by DPIE throughout the above consultation, and how these items have been addressed, in presented in Table 6-2 below.

Table 6-2 Key consultation aspects and responses - DPIE

Aspect for consideration	Response	Reference
The PFD storage facility located to the north of the Proposal site may be a potentially hazardous facility (e.g. if coolant is stored onsite) and should be considered within the hazard and risk assessment; particularly if it is located on the same lot as the Proposal.	A review of the DA prepared for the PFD storage facility (which was lodged with Council) confirmed that the PFD facility is not considered potentially hazardous and does not store hazardous goods onsite. It is noted the PFD storage facility is located on a separate lot. Hazards and risks have been assessed for the Proposal and are presented in Chapter 12 of this EIS.	Chapter 12
A clear description of how waste streams would be processed should be provided.	A detailed description of how waste would be processed within the MRF has been provided in Section 4.5. Waste management details included in the EIS include: • A description of the waste streams that would be accepted at the site including maximum daily, weekly and annual throughputs and the maximum size for stockpiles • A detailed description of waste processing operations including a description of the technology to be installed, resource outputs, and the quality control measures that would be implemented • Details of how waste would be stored and handled on site, and transported to and from the site, including details of how the receipt of non-conforming waste would be dealt with • Details of the waste tracking system for incoming and outgoing waste.	Section 4.5
Contamination may need to be assessed as part of the EIS	No excavation beyond the depth of imported fill or major ground disturbance is proposed as part of the Proposal. Therefore, there is considered to be a negligible potential to disturb either contaminated soil or groundwater as a result of the Proposal. Notwithstanding this an appraisal of the potential to disturb or cause contamination has been provided in Chapter 10 of this EIS.	Chapter 10
Aboriginal heritage may need to be assessed as part of the EIS.	No excavation beyond the depth of imported fill or major ground disturbance is proposed as part of the Proposal. Therefore, there is considered to be a negligible potential to disturb any item of Aboriginal heritage significance. Further, an Aboriginal Due Diligence Assessment (Appendix Q) prepared for the Chullora RRP site found that it was highly unlikely the Chullora RRP site would contain any Aboriginal heritage items. Notwithstanding this an appraisal of the potential to disturb any item of Aboriginal heritage significance is provided in Chapter 13 of this EIS.	Chapter 13 Appendix Q

Aspect for consideration	Response	Reference
Fire prevention and suppression infrastructure should be incorporated into the Proposal design. The design of fire infrastructure should be provided to Fire and Recuse for feedback prior to the EIS being exhibited.	A detailed and robust fire infrastructure design has been prepared for the Proposal and is provided in Appendix G. The fire systems designs are described in Section 4.3.5. The design of the Proposal, including the proposed fire infrastructure, has been provided to FRNSW for review and to seek feedback. Consultation undertaken with FRNSW is outlined in in Table 6-4 below.	Table 6-4 Section 4.3.5 Appendix G Fire Safety Strategy Appendix H Fire Systems Design
The EIS should consider applicable planning instruments and legislation	Chapter 5 provides a detailed review of the planning instruments and legislation applicable to the Proposal.	Chapter 5

NSW Environment Protection Authority

The EPA have been consulted throughout the preparation of the EIS, regarding various elements of the Proposal. Consultation with the EPA has comprised the following activities:

- A face-to-face meeting was held between SUEZ, DPIE, the EPA and FRNSW on 4th February 2020
- A virtual meeting was held between SUEZ and the EPA on 19th May 2020
- Telephone conversations, as well as letter and email correspondences have occurred throughout the development of the EIS.

The key aspects raised by the EPA throughout the above consultation, and how these items have been addressed, in presented in Table 6-3 below.

Table 6-3 Key consultation aspects and responses - EPA

Aspect for consideration	Response	Reference
Fire systems should be appropriately designed given the history of the previous Chullora RRC.	A detailed and robust fire infrastructure design has been prepared for the Proposal and is provided in Appendix G. The fire systems designs are described in Section 4.3.5. The design of the Proposal, including the proposed fire infrastructure, has been provided to FRNSW for review and to seek feedback. Consultation undertaken with FRNSW is outlined in in Table 6-4 below.	Table 6-4 Section 4.3.5 Appendix G Fire Safety Strategy Appendix H Fire Systems Design
The site suitability, particularly in regard to any previous contamination and remediation, should be confirmed as part of the EIS	Potential contamination has been identified within the Chullora RRP site during previous inspections, however following implementation of a site remediation action plan in 2016 the Proposal site was deemed suitable for commercial / industrial use (Enviroview, 2016) (NSW EPA, 2016a). Any potentially contaminated lands will have been excavated or capped as part of the proposed flood mitigation works (DA 366/2020) prior to the commencement of the Proposal and subsequently would not be disturbed by the Proposal. The Proposal includes establishing of a permanent hard stand area across the entire Proposal site which would mitigate disturbance to sub surface soil, eliminate erosion and sedimentation risks and minimise the risk of accidental	Chapter 10 Section 24.2.3

Aspect for consideration	Response	Reference
	spills and leaks causing contamination during construction and operation. The suitability of the site is further confirmed in 24.2.3.	
An existing EPL is in place for the previous Chullora RRC. Whether the EPL would be amended or a new one sought should be considered, either as part of the EIS or following approval	The previous Chullora RRC holds EPL 5893 which authorises a number of scheduled activities including, composting, recovery of general waste, and waste storage. The existing EPL could either be updated via a variation application or a new one sought for the Proposal. This would be confirmed following approval of the EIS.	Section 5.3.2

Fire and Rescue NSW

FRNSW have been consulted throughout the preparation of this EIS, regarding various elements of the Proposal. Consultation with Fire and Rescue has comprised the following activities:

- A face-to-face meeting was held between SUEZ, DPIE, the EPA and FRNSW on 4th February 2020
- The preliminary fire systems design (Appendix H) and Fire Safety strategy (refer Appendix G) were provided to FRNSW for their review and to seek feedback
- A site visit was held with Fire and Rescue on 12th May 2020 and included discussions of the fire systems proposed as part of the Proposal.

Aspects raised by FRNSW during the above consultation activities and how these items have been addressed, are presented in Table 6-4 below.

Table 6-4 Key consultation aspects and responses - FRNSW

Aspect for consideration	Response	Reference
The approach to the design of fire systems should consider: • The importance of protecting the asset • The approach to address the 'deemed to satisfy' conditions outlined in the *Fire Safety Guideline: Fire Safety in Waste Facilities* (FRNSW, 2020) • A review of the fire risk and determination of appropriate controls to manage this risk • Engagement with FRNSW.	A detailed fire systems design has been prepared for the Proposal in consideration of *Fire Safety Guideline: Fire Safety in Waste Facilities* (FRNSW, 2020), and is provided in Appendix H. Fire systems incorporated into the design of the Proposal are described in Section 4.3.5 and: • High hazard sprinkler systems • Thermal cameras • Alarm system and automatic shutdown system for fixed plant and equipment in the event a fire is detected via thermal cameras • Deluge systems where openings between compartments within the MRF are located (e.g. where conveyors extend through the fire walls between the receival area and the processing area) • Connection to water mains • Fire hose reels • Fire hydrants • An underground ring main around the MRF • Two hydrant tanks (432,000 L total) and two sprinkler tanks (1,104,000 L total)	Section 4.3.5 Chapter 12 Appendix G Fire Safety Strategy Appendix H Fire Systems Design

Aspect for consideration	Response	Reference
	• Fire hydrant and sprinkler boosters • Fire control centre and pump room • Inground isolation values and backflow preventer • Fire water detention system • Emergency exit points. The potential hazards, including fires or explosion, associated with the Proposal have been assessed in Chapter 12.	
Separation of stockpile locations at either end of the MRF with separation walls compartmentalising the various areas of the MRF is considered a novel, and preferable, layout	The MRF has been specifically designed to minimise fire risk. The separation of stockpile volumes at either end of the MRF and provision of fire separation walls (with an FRL of 90 / 90 /90) to provide compartment isolation provides the following benefits: • Provides asset protection for the fixed plant and equipment located within the processing area • Separates the possible fuel loads in the event of a fire by splitting the stockpile volumes at either end of the MRF	Section 4.3.5 Chapter 12 Appendix G Fire Safety Strategy Appendix H Fire Systems Design
Inclusion of thermal detection systems and a trip system that automatically shuts down fixed plant (particularly conveyor systems) is considered preferable.	The fire systems within the MRF would include thermal detection cameras which would sound an alarm and automatically stop all fixed plant and equipment (including conveyors) in the event a fire is detected.	Section 4.3.5 Appendix G Fire Safety Strategy Appendix H Fire Systems Design
If polystyrene would be accepted at the MRF the sprinkler tank and fire water detention basins would need to be sized accordingly, to account for the increased fire hazard associated with polystyrene.	Polystyrene is not proposed to be accepted as a waste stream within the MRF. However, there is a possibility that some polystyrene would enter the MRF as contamination within received waste loads. The proportion of waste that would likely comprise polystyrene is anticipated to be minimal. Due to the flammable nature of polystyrene it would be removed from the MRF immediately. A dedicated bin would be provided for any polystyrene which would be regularly checked and emptied.	Section 4.5.5
Fire appliances (trucks) cannot traverse weighbridges. Adequate space to manoeuvre to access the fire systems and the MRF via a bypass around the weighbridges should be provided. Any bypass gates should be clearly signposted to demarcate their function and location.	A swept path analysis has been carried out to confirm manoeuvrability of fire trucks to access the fire services (refer Appendix J). Design amendments were made to ensure adequate manoeuvring area was provided (refer Section 6.7). A bypass gate has been provided along the queuing lanes upon entrance of the Proposal site to provide fire vehicles direct access to the MRF without vehicles having to pass over weighbridges. The gate will be clearly signposted as an emergency vehicle access gate.	Section 4.3.5 Appendix J - TIA
Installation of a foam supply is not considered preferable. The use of a sprinkler system and easy access for fire fighters to pull	A sprinkler system would be installed across all areas of the MRF. Where conveyors extend through fire separation walls between areas within the MRF (e.g. between the receival area and the processing	Section 4.3.5 Appendix G Fire Safety Strategy

Aspect for consideration	Response	Reference
apart any smouldering stockpiles of materials is preferred over a foam supply, as foam can reduce visibility for firefighters.	area) deluge systems would be installed. A foam supply has not been incorporated into the design.	Appendix H Fire Systems Design
It is preferable that the design of the internal and external walls is such that it can be easily identified where the wall is concrete (rather than Colourbond steel)	The design of the walls would comprise dado walls up to three m height with Colourbond material (of a different colour) extending from the height of the dado wall to the roof, making it clearly evident where the extent of the concrete wall ceases.	Chapter 4 Section 4.3.1 Appendix E Concept Plan and Architectural Designs
Ongoing consultation should be carried out with FRNSW if possible	SUEZ are committed to ongoing consultation with FRNSW in future stages of the development of the Proposal.	N/A

Transport for NSW

Given TfNSW's role as NSW's transport and roads agency, consultation activities with TfNSW have centred around the transport aspects of the Proposal. SUEZ provided TfNSW with a draft version of the TIA (Appendix J) on 8th April 2020 to provide TfNSW with an overview of the traffic and access impacts associated with the Proposal and to seek feedback regarding the TIA and the Proposal. TfNSW confirmed, via email response, on 29th April that they had reviewed the draft TIA and had no comments at this stage. They further noted that an in-depth assessment would be conducted during EIS exhibition.

Sydney Water

Sydney Water have been consulted throughout the preparation of this EIS. Consultation with Sydney Water has comprised the following activities:

- A letter was prepared and issued Sydney Water on 28th May 2020 providing them with background information regarding the Proposal, and outlining aspects considered of interest to Sydney Water and how these were being considered. No response had been received from Sydney Water at the time of EIS exhibition.
- Multiple attempts at correspondence via telephone were made throughout the preparation of the EIS. Attempted phone calls however were not answered or returned at the time of EIS exhibition
- Extensive previous consultation has been carried out with Sydney Water by Costin Roe and Frasers Property (the owner of the Chullora RRP site) during the recent upgrade works to formalise the Cooks River stormwater canal. While this consultation did not directly relate to the Proposal, the future development works envisaged for the Chullora RRP site were outlined to Sydney Water during this consultation.

The Proposal includes the erection of a temporary pedestrian walkway overbridge that would span the Cooks River stormwater canal. The walkway would connect the mezzanine floor of the internal site office within the receival area of the MRF directly to the south-western corner of the existing car park. A lift and stairs would be installed to provide access to the walkway from the car park. The walkway would traverse the Cooks River stormwater canal, and its easement, in its entirety with no piers proposed to be installed within or adjacent to the canal. A building over and adjacent (BOA) works approval will be sought from Sydney Water during the detailed design phase of the Proposal. Further consultation will be undertaken with Sydney Water at this stage.

Canterbury-Bankstown City Council

Council has been consulted regularly throughout the preparation of this EIS, regarding various elements of the Proposal. Consultation with Council has comprised the following activities:

- A face-to-face meeting was held between SUEZ and Council's planning assessment team on 2nd March 2020
- A draft version of the TIA was provided to Council on 8th April 2020 for review by their traffic team. Follow up correspondence via email was provided on 28th April 2020. Council's traffic team provided a written response with questions and comments date 21st April 2020.
- A face-to-face meeting was held between SUEZ and Council's traffic team on 27th May 2020
- A virtual meeting was held between SUEZ and Council's planning assessment and waste policy team on 20th July 2020
- Further email and telephone correspondence occurred periodically during the preparation of the EIS.

Aspects raised by Council during the above consultation activities and how these items have been addressed, are presented in Table 6-5 below. It is noted that the initial face-to-face meeting with Council primarily discussed the flood mitigation works that have been recently proposed by SUEZ (refer Section 2.3). These works are subject to a separate DA (DA 366/2020). Aspects discussed during consultation that are considered directly related to those works have not be considered further here.

Table 6-5 Key consultation aspects and responses - Council

Aspect for consideration	Response	Reference
The flood storage solution would only accommodate the first two stages of the Chullora RRP.	SUEZ have recently sought approval to complete flood mitigation works across the Chullora RRP (DA 366/2020) (refer Section 2.3). These works would be completed prior to the construction of the Proposal and would provide the Proposal with flood immunity up to the 1-in-100 year rainfall event. An assessment of flood impact to / from the Proposal is provided in Appendix L and summarised in Chapter 9. Any future stages of the Chullora RRP would need to assess flood immunity.	Chapter 9 Appendix L Water and Hydrology Assessment
The risk of waste materials being washed offsite during a flood event should be considered.	As noted above, flood mitigation works would be completed prior to the commencement of the Proposal. The works would provide the Proposal with immunity up to the 1-in-100 year rainfall event. Further, no waste would be stored outside the MRF building. Therefore, there would be a negligible risk of waste materials being washed offsite during a flood event.	Chapter 9 Appendix L Water and Hydrology Assessment
	As noted above, flood modelling has been completed to determine the impact of flooding on the Proposal, and the potential for the Proposal to change flood regimes. An assessment of flood impact to / from the Proposal is provided in Appendix L and summarised in Chapter 9.	Chapter 9 Appendix L Water and Hydrology Assessment
The design of the Proposal should, if possible, avoid any physical works within the Cooks	No physical works are proposed to be carried out within the Cooks River stormwater canal easement as part of the Proposal.	N/A

Aspect for consideration	Response	Reference
River stormwater canal and easement		
The site is well buffered from residential receivers and is surrounded by industrial neighbours. The local community is likely to recognise that the site has a history of use as a waste management facility. These factors should be considered within the consultation approach.	A CSPS has been prepared for the Proposal (provided in Appendix I), which has been developed based on the location, history and nature of the Proposal. Chapter 6 provides an overview of the consultation process carried out during the preparation of the EIS.	Chapter 6 Appendix I CSPS
The TIA should provide an assessment of parking needs for the Proposal	The TIA (Appendix J) and Section 7.5.5 of this EIS provides an assessment of parking needs, noting that the existing car park has a sufficient number of spaces to accommodate all light vehicles associated with the operation of the Proposal.	Section 7.5.5 Appendix J TIA
Biodiversity should be assessed given the presence of the EEC in the north-western portion of the Chullora RRP site.	No works are proposed in the north-western portion of the Chullora RRP site. No vegetation clearing is proposed as part of the Proposal. Notwithstanding this Chapter 13 provides an assessment of potential impacts on biodiversity as a result of the Proposal.	Chapter 13
The traffic impact assessment should consider: • The capacity of Muir Road • Turning circles around the Muir Road roundabout • SIDRA modelling of the Muir road site entrance • Travel routes to and form the Proposal site Turning lane storage capacity on Rookwood Road	The TIA (Appendix J) and Section 7.5.5 of this EIS provides an assessment of: • The capacity of Muir Road • Turning circles around the Muir Road roundabout • The capacity and performance of the site entrance • Travel routes to and from the Proposal site The turning lane storage capacity on Rookwood Road	Section 7.5.5 Appendix J TIA
A detailed traffic management plan should be prepared and include details on the types of vehicles (and their axle loads) that will be accessing the Proposal site	Section 4.5.6 and Appendix J provide a description of the type, weight and number of vehicles accessing the Proposal site. Site-specific Traffic Control Plans (TCPs) will be prepared as part of the CEMP to outline how construction vehicle manoeuvres will be accommodated in and out of the work site. An OTMP will be prepared to address the specific traffic control requirements during the operational phase of the Proposal, including details regarding vehicle types and axle loads.	Section 4.5.6 Section 7.6 Appendix J TIA
Illegal parking is observed as occurring at the site entrance on Muir Road. Consideration should be given to installing 'no stopping' signs in this area	In response to illegal parking occurring within the Muir Road site entrance SUEZ have provided temporary traffic cones. SUEZ will review the opportunity for permanent signage in consultation with Council during the detailed design phase of the Proposal.	N/A

Aspect for consideration	Response	Reference
Heavy vehicle routes should be identified	Section 7.2.6 and Appendix J describe the anticipated distribution of vehicles across key access routes for the Proposal.	Section 7.2.6 Appendix J TIA
The existing footpath on Muir Road should be extended to the western side of the Muir Road site entrance, and the existing median should be augmented to allow suitable pedestrian access.	SUEZ will review the opportunity to extend the existing pedestrian footpath along Muir Road to extent up to, and across, the Muir Road site entrance. Further consultation will be undertaken with Council to confirm the delivery and nature of these works during the detailed design phase of the Proposal.	N/A
The boulders used to demarcate the entrance into Anzac Street should be removed. A formal vehicle crossing (driveway) and revenant signage should be installed at the Anzac Street entrance	The Proposal would include the formalisation of the site entrance, including: • Removal of the sandstone boulders • Provision of a gate to prevent unauthorised access to the carpark • Installation of signage (refer Appendix E).	Section 4.3.2 Appendix E Concept Plan and Architectural Design
Bicycle parking racks should be provided as part of the Proposal	A total of ten bicycle racks would be installed as part of the Proposal.	Section 4.3.2
Consideration of the covenant (preventing use of the land for the purposes of waste management) in place for Lot 1 DP 1227526 should be given if the Proposal seek to impact this parcel of land.	The Proposal would be wholly contained within Lot 2 DP 1227526, and would therefore not impact the covenant in place for Lot 1.	Section 2.7
Due to the nature of the proposal, it is requested that fire safety management measures form part of the future EIS. A detailed fire report by a suitably qualified consultant is recommended to demonstrate that the relevant fire safety requirements are implemented during the design and ongoing management of the facility, including information on emergency evacuation and types of building materials to be used and the fire resistance of these materials.	A detailed fire systems design has been prepared for the Proposal in consideration of *Fire Safety Guideline: Fire Safety in Waste Facilities* (FRNSW, 2020), and is provided in Appendix H. Fire systems incorporated into the design of the Proposal are described in Section 4.3.5 and: • High hazard sprinkler systems • Thermal cameras • Alarm system and automatic shutdown system for fixed plant and equipment in the event a fire is detected via thermal cameras • Deluge systems where openings between compartments within the MRF are located (e.g. where conveyors extend through the fire walls between the receival area and the processing area) • Connection to water mains • Fire hose reels • Fire hydrants • An underground ring main around the MRF • Two hydrant tanks (432,000 L total) and two sprinkler tanks (1,104,000 L total) • Fire hydrant and sprinkler boosters	Section 4.3.5 Chapter 12 Appendix G Fire Safety Strategy Appendix H Fire Systems Design

Aspect for consideration	Response	Reference
	• Fire control centre and pump room • Inground isolation values and backflow preventer • Fire water detention system • Emergency exit points. The potential hazards, including fires or explosion, associated with the Proposal have been assessed in Chapter 12.	
A detailed Air Quality and Odour Assessment is required on the potential impacts of the proposal on the surrounding environment.	Katestone Environmental Pty Ltd (Katestone) have prepared an Air Quality Impact Assessment (AQIA) to assess the air quality and odour impacts associated with the Proposal	Chapter 8 Appendix K AQIA
A Construction Management Plan and an Operational Management Plan are required to demonstrate measures to minimise the generation of dust during construction and operational phases of the proposal. Dust and odour must be managed within the site and not disperse / settle on any adjoining sites.	Air quality management features have been included within the proposed design to proactively manage the potential for impacts to the surrounding including: • Enclosed shed • Misting system • Enclosed transfer points • Sealed haul roads. A CEMP, or equivalent, will be prepared for the Proposal to minimise air quality and odour impacts. Where appropriate, mitigation measures to minimise the air quality and odour impacts during construction will be reviewed and considered for incorporation into the CEMP. An OEMP, or equivalent, will be prepared for the Proposal that will include measures to minimise air quality and odour impacts. Where appropriate, mitigation measures to minimise the air quality and odour impacts during operation will be reviewed and considered for incorporation into the OEMP.	Chapter 8 Appendix K AQIA

6.4 Community consultation

6.4.1 Stakeholder identification

Chullora is in the north-eastern corner of the Canterbury Bankstown LGA. Unlike some of its neighbouring suburbs (e.g. Greenacre) which contain a large volume of residential properties, Chullora is predominantly comprised of industrial and manufacturing properties. The suburb is characterised by “transport, postal and warehousing, and food product manufacturing”. These industries represent about 20 per cent of employment in the precinct. Utilities, creative industries and wholesale and retail trade are other activities in the precinct, which is an important location for urban services. Chullora focuses more heavily on interstate rail freight than port shuttles (Greater Sydney Commission, 2018b).

The closest residential receivers are approximately 455 m to the southwest and 600 m to the east of the site and residences are not visually exposed.

Given the location, history and nature of the Proposal the key community stakeholders were identified as being:

- Neighbouring properties and business (e.g. PFD Food Services and Veolia Recycling Centre)

- Nearby businesses across the broader Chullora Technology Park (e.g. TAFE NSW Chullora and Pacific National).

6.4.2 Consultation mediums and collateral

Consultation activities had originally intended to include door knocking within the surrounding suburb to provide neighbouring and nearby property owners with an overview of the Proposal and to seek feedback on the Proposal. Due to COVID-19 and government social-distancing recommendations, it was subsequently considered more appropriate to limit consultation activities to virtual and printed mediums. The following mediums were adopted to undertake community consultation including:

- **A community information mail-out** (an excerpt of which is shown in Figure 6-1): A flyer was designed and distributed to commercial and industrial properties across the surrounding suburb to inform the community about the Proposal. The mail-out included:
  - A cover letter
  - A form inviting feedback
  - Background information regarding the Proposal
  - Links to seek further information.

  A copy of the mail-out collateral is provided in Attachment A of the CSPS (Appendix I).
- **Follow up correspondence:** Following the dissemination of the community mail-out SUEZ followed up with neighbouring and nearby property owners via telephone and email to confirm receipt of the mail-out and to seek feedback. A detailed list of follow up correspondence is provided in the CSPS (Appendix I)
- **Feedback survey:** An online survey was developed to seek feedback and investigate areas considered most likely to be of interest to the community. The survey involved a series of closed, multiple-choice questions, and one open question where respondents could openly express their opinion
- **A dedicated Proposal website:** SUEZ has established and maintained a dedicated Proposal website (https://www.suez.com.au/en-au/news/projects/chullora-development). The website includes key features of the Proposal, a project timeline and invites visitors to provide feedback via a feedback form and short survey. An extract from the Proposal website is shown in Figure 6-2 and provided in Attachment A of the CSPS (Appendix I).

MRF Process

SUEZ's **Materials Recycling Facilities (MRF's)** use the latest in technology to maximise the recovery of recyclables from waste.

MRF's are like giant factories where the **recyclable materials** collected from homes and business are taken to be sorted into different types, or 'streams'. The separated waste products are then transported to manufacturers for **reprocessing into new products:** everything from packaging and paper products through to road base, outdoor furniture, bike parts and appliances.

From waste to resource

1. **Loading:** The waste is fed into the process through a conveyor
2. **Pre-sort:** Bulky and non-recyclable wastes is pre-sorted and extracted from the waste flow
3. **Screening:** Using shape selection screening, glass, 3D objects (containers) and 2D objects (paper and cardboard) are separated for further process
4. **Glass processing:** Glass is separated by size and sent to glass recyclers or road builders.
5. **Paper and cardboard processing:** Paper and cardboard are sorted into high quality valuable streams
6. **Aluminium processing:** An Eddy Current selectively extracts all aluminium cans
7. **Plastic processing:** High quality plastic streams (HDPE, PET, PPE) are sorted from the waste stream to be returned into the market
8. **Steel processing:** Electromagnets capture all steel materials from the process
9. **Baling and transport:** The processed and sorted material streams are baled to improve transport efficiency

Indicative Timeline

We are currently undertaking a comprehensive environmental impact assessment. SUEZ is committed to engaging and consulting extensively with the community throughout this process.

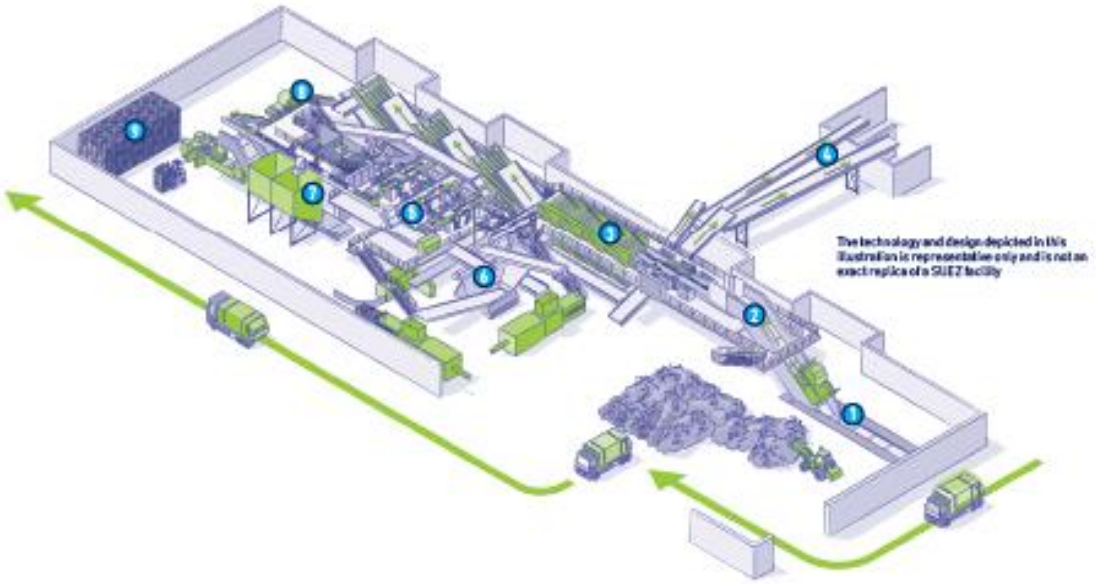
The indicative timeline below outlines key phases that will guide the process.

2019
- Feasibility investigations
- Preparation of Scoping Report and Request to Department of Planning, Industry (DPIE) and Environment for Secretary's Environmental Assessment Requirements (SEARs)

2020
- Detailed planning, community consultation and Environmental Impact Statement (EIS) development
- EIS public exhibition and consultation
- Decision Point: Project determination by DPIE

2021
- Construction

2022
- Operation



For further information and to give us feedback please visit: www.suez.com.au/chullora

A link to the DPIE's Scoping Report, SEARs and planning timeline is also available at this page.

suez

Figure 6-1 Excerpt from community information mail-out (full version provided in Appendix I)

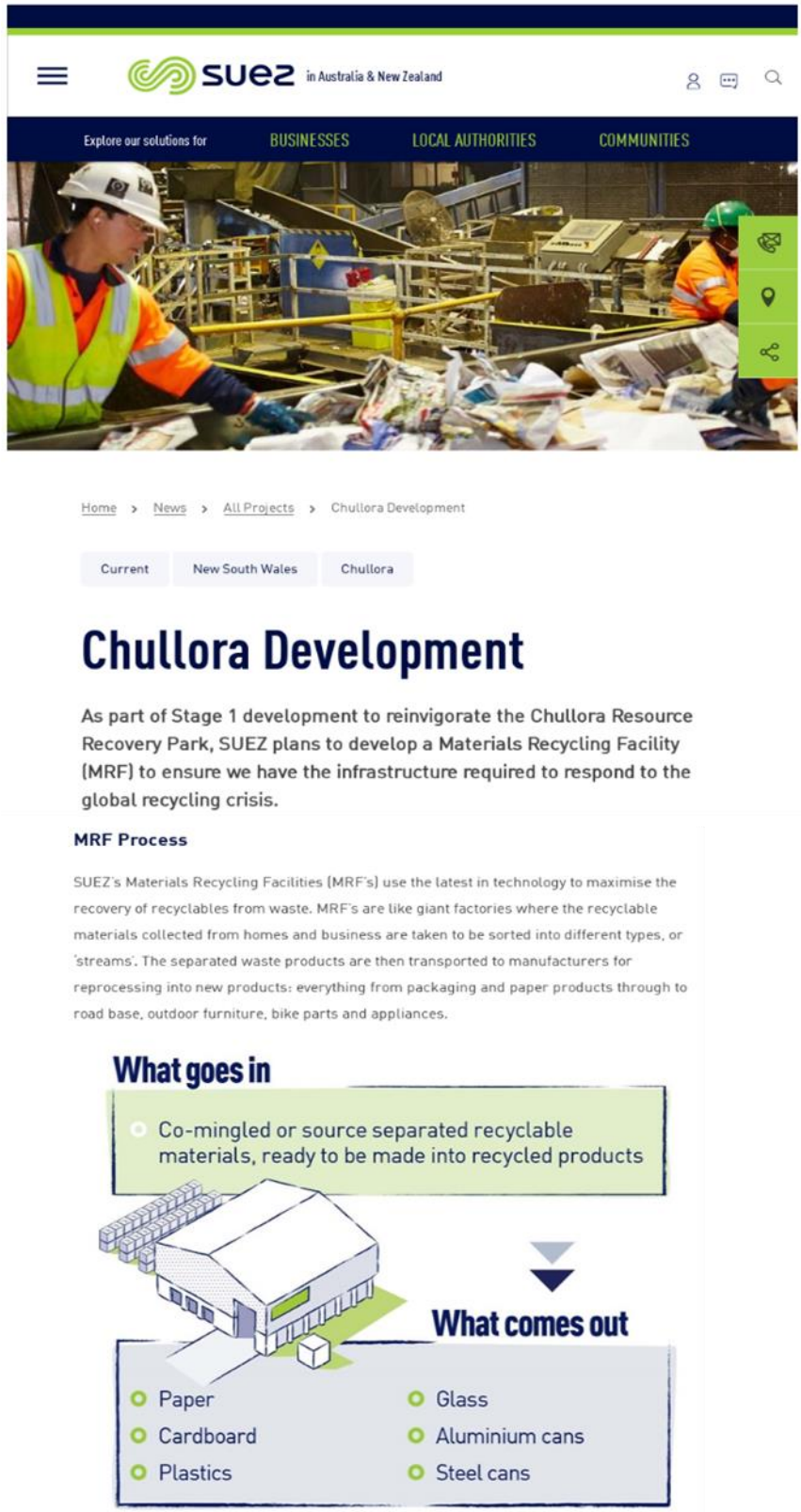


Figure 6-2 Extract from dedicated Proposal webpage

6.4.3 Consultation outcomes

The consultation outcomes from the activities described in Section were as follows:

- **Community mail-out and follow-up correspondence:** Direct feedback was provided by only one nearby property during SUEZ' direct follow up correspondence. The nearby business sought additional background regarding the Proposal and noted that they had no concerns around the development.
- **Feedback survey:** No responses were obtained via the survey. This was despite all nearby properties being invited to participate via a weblink and the Proposal website. The risk that potential survey respondents were not aware of the survey's existence was offset by SUEZ staff contacting stakeholders adjacent, and nearby, to the site mid-way through the survey date range.
- **Dedicated Proposal website:** Analytics data of the SUEZ Chullora webpage between 29 February 2020 to 30 May 2020 revealed a total of 66 page views, with 62 of them being unique page views. This indicated that the letterbox mail-out had successfully directed interested parties to the website. While the visitors were encouraged to provide feedback by completing the survey, no feedback was received. The average time on the site was 3 minutes 42 seconds.

Despite numerous avenues seeking feedback regarding the Proposal only one response was received. The Chullora RRP site operated as the previous Chullora RRC until 2017 (refer Section 2.3). It is possible that minimal feedback was received regarding the Proposal due to the long history of the site operating as a waste management facility, whereby neighbouring properties would already be accustomed to operations of this nature.

SUEZ also received multiple calls from prospective contractors reaching out to explore potential work opportunities associated with the future construction of the MRF. This supports the potential of this Proposal generating employment benefits and positive social impact.

6.5 Consultation during the EIS exhibition

This EIS is being exhibited for a minimum of 30 calendar days. This EIS can be viewed online on the DPIE website as well as the Proposal webpage (electronic version).

- .

During the exhibition period, DPIE will invite written submissions on the Proposal from the community, government and non-government agencies, stakeholders and other interested parties. SUEZ will also undertake a number of consultation activities during the exhibition period including:

- Responses to media requests
- Updating and monitoring the dedicated Proposal webpage on the SUEZ website announcing the EIS public exhibition, encouraging feedback on the EIS
- Emailing the mailing list of those community members who registered interest.

After the exhibition of the EIS, the Secretary of Planning and Environment will provide copies of any submissions received to SUEZ. The Secretary may then require SUEZ to prepare a submissions report to respond to the issues raised in submissions. The Secretary will prepare an environmental assessment report and provide it to the Minister for Planning. The Minister for Planning will then decide whether or not to approve the Proposal and the conditions attached.

6.6 Ongoing consultation

SUEZ will continue to carry out consultation after the completion of the planning phase of the Proposal, into its construction and operational phases. Ongoing consultation will include:

- Ongoing responses to any media request
- Regular updates of the dedicated webpage outline key milestone and any updates
- Ongoing monitoring of the website analysists and encouragement of feedback

- Periodic mailing of those who have registered interest
- Maintenance of a complaints register.

6.7 Design refinements

The aspect raised most frequently during the consultation process was the potential risk of fire at the MRF. While other items were raised during consultation (e.g. contamination, hazards and risk and flooding design), these were largely raised as queries only, and have been addressed through the impact assessment process encompassing this EIS. The focus of design refinements in response to stakeholder feedback, has therefore largely centred on the fire systems design for the Proposal. The following steps have been undertaken to ensure a robust and adequate fire design has been incorporated into the Proposal:

1. Initial consultation with DPIE, FRNSW and the EPA was undertaken in early February 2020 where the need for a robust fire design was first identified by key stakeholders
2. SUEZ prepared a draft fire systems design and sought an independent draft Building Code of Australia (BCA) review be carried out for the design of the MRF. This design process included multiple iterations and active engagement between SUEZ and the BCA Accredited Certifiers (Concise Certification Pty Ltd)
3. The draft design and BCA compliance report were provided to FRNSW for their review and comment
4. A site visit was held with FRNSW on 12th April 2020 to discuss the design and receive feedback
5. Subsequent amendments were made to the design and a final BCA compliance report was prepared (provided in Appendix F). These amendments were made in direct response to feedback received from FRNSW, and included
   - Relocation of the outbound weighbridge to ensure that fire vehicles can easily manoeuvre (via a reversing movement) to access the fire systems in the north-western portion of the Proposal site
   - Inclusion of clear signage demarcating the location and function of the emergency vehicles weighbridge bypass access gate.

The final fire systems design is described in Section 4.3.5 and shown in Appendix G.

A number of other minor design amendments have been made in response to other stakeholder feedback including:

- Provision of ten bicycle parking racks within the car parking area
- Inclusion of the formalisation of the Anzac Street entrance to:
  - Remove the existing sandstone boulders
  - Install a gate to prevent unauthorised access
  - Provide clear signage demarcating the site entrance and ownership of the site (refer Appendix E).

The final fire systems design is described in Section 4.3.5 and shown in Appendix H.

Conclusion

SUEZ have prepared a CSPS to outline their approach to consultation, which contains a number of consultation objectives reflecting SUEZ' commitment to listening and engaging with the community and key stakeholders of the Proposal to identify and address any concern.

Consultation has been carried out with several government agencies prescribed in the SEARs via various mediums, including face-to-face meetings, email and telephone correspondence, letter correspondence, site visits and provision of draft report content for review. Aspects raised by government agencies largely focused on the fire design of the Proposal; following which a number of design refinements have been made to ensure a robust fire systems design.

The Proposal site is within an industrial area of Chullora and therefore surrounded by industrial properties. Given the location, history and nature of the Proposal the key community stakeholders were identified as being property and business owners within the surrounding suburb. Consultation activities with nearby property and business owners has included community information mail-outs, follow up direct correspondence, a feedback survey and a dedicated Proposal website. Only one response was received via the above consultation activities, which noted no major concerns with the Proposal.

Further consultation will be undertaken by SUEZ during the exhibition of the EIS and the future delivery of the Proposal.

PART B

ASSESSMENT OF KEY ISSUES



7 TRAFFIC, ACCESS AND PARKING

Summary

The Transport Planning Partnership (TTPP) have prepared a Traffic Impact assessment (TIA) to assess the traffic, access and parking impacts associated with the Proposal (Appendix J)

The surrounding road networks of the Proposal site which were assessed for traffic and access impacts include:

- Hume Highway (A22)
- Rookwood Road / A6
- Muir Road
- Brunker Road
- Anzac Street.

Traffic generated by the Proposal is not expected to compromise the safety or function of the surrounding road network. Any impact due to construction vehicles during the road network peak periods is expected to be minimal and would have no noticeable impact on the local road network. Operation of the Proposal would cause an additional 0-1 second to intersection average delay due to site-generated traffic. Therefore, the Proposal would have an insignificant impact on surrounding road network performance.

Vehicle access to and from the Proposal site is provided via Muir Road for heavy vehicles and Anzac Street for light vehicles. The internal road layout of the Proposal site is designed to accommodate forward movements by the largest vehicle accessing the Proposal site. Upon exit, all vehicles would turn left onto Muir Road. Parking and stacking spaces for trucks would be established and demarcated in the northern part of the Proposal site.

The Proposal site is primarily served by bus services including the 925 and the M92. The proposed construction and operational activities would not adversely impact existing public transport services.

The Proposal site generates a need for a maximum of 45 car parking spaces which can easily be accommodated within the existing car park.

Measures to further manage operation and safety of traffic within the Proposal site are proposed to be included in the CEMP and dedicate Traffic Control Plans (TCPs) and an Operational Traffic Management Plan (OTMP).

7.1 Introduction

The Transport Planning Partnership (TTPP) have undertaken an assessment of the potential traffic, transport and access impacts associated with the Proposal to address the SEARs issued by DPIE. The Traffic Impact Assessment (TIA) for the Proposal is provided in Appendix J of this EIS. Table 7-1 provides a summary of the relevant SEARs which relate to traffic and access, and where these have been addressed in this EIS.

Table 7-1 SEARs (traffic and access)

SEARs	Where addressed
Traffic and transport	
Details of all traffic types and volumes likely to be generated during construction and operation, including a description of haul routes. Traffic flows are to be shown diagrammatically to a level of detail sufficient for easy interpretation.	Section 4.4.4 and Section 7.4.1 (construction traffic types and volumes) Section 4.5.6 and Section 7.2.6 (operation traffic types and volumes) Section 7.5.1 (haul routes and traffic flows)

SEARs	Where addressed
	Appendix J TIA
An assessment of the predicted impacts of this traffic on road safety and the capacity of the road network, including consideration of cumulative traffic impacts at key intersections using SIDRA or similar traffic model. This is to include the identification and consideration of approved and/or proposed developments in the vicinity.	Section 7.5.4 (road safety) Section 7.5.2 (capacity of the road network) Chapter 20 (cumulative impacts) Appendix J TIA
Detailed plans of the proposed layout of the internal road, weighbridge locations, pedestrian network and parking on site in accordance with the relevant Australian Standards and Council's DCP	Section 4.2 (layout) Section 7.5.6 (parking provisions) Appendix E Concept Plan and Architectural Designs
Plans of any proposed road upgrades, infrastructure works or new roads required for the development	No road upgrades or new roads are proposed or required as part of the Proposal
Plans demonstrating how all vehicles associated with construction and operation awaiting loading, unloading or servicing can be accommodated on the site to avoid queuing in the street network.	Section 7.5.6 Appendix J TIA
Swept path diagrams depicting vehicles entering, exiting and manoeuvring throughout the site for both heavy and light vehicles.	Appendix J TIA

Further to the above, TfNSW and Council require further details on specific requirements relating to their authority. These requirements are discussed throughout this EIS and are provided in Table 7-2 below.

Table 7-2 Other agency requirements and relevant report sections (traffic and access)

Aspect	Where Addressed
TfNSW	
TfNSW require the following issues to be included in the transport and traffic impact assessment of the proposed development: Daily and peak traffic movements likely to be generated by the proposed development including the impact on nearby intersections and the need/associated funding for upgrading or road improvement works (if required). The key intersections to be examined / modelled (in a network model in SIDRA) include: • Rookwood Road / Muir Road • Hume Highway / Muir Road • Site access / Muir Road	Section 7.4.1 (construction traffic types and volumes) Section 4.4.4 and Section 7.4.1 (construction traffic types and volumes) Section 4.5.6 and Section 7.2.6 (operation traffic types and volumes) Section 7.5.2 (capacity of the road network) Section 7.5.4 (need for intersection upgrade) Appendix J TIA
Details of the proposed accesses and the parking provisions associated with the proposed development including compliance with the requirements of the relevant Australian Standards (i.e. turn paths, sight distance requirements, aisle widths, etc.).	Section 7.5.6 (parking provisions) Section 7.5.5 (access and sight distances) Appendix J TIA

Aspect	Where Addressed
Proposed number of car parking spaces and compliance with the appropriate parking codes.	Section 7.5.6 (parking provisions) Appendix J TIA
Detail of service vehicle movements (including vehicle type and likely arrival and departure times).	Section 4.4.4 and Section 7.4.1 (construction traffic types and volumes) Section 4.5.6 and Section 7.2.6 (operation traffic types and volumes) Appendix J TIA
TfNSW requires the Transport Impact Assessment to assess the implications of the proposed development for non-car travel modes (including public transport use, walking and cycling); the potential for implementing a location-specific sustainable travel plan (e.g.; Green Travel Plan, 'Travelsmart' or other travel behaviour change initiative); and the provision of facilities to increase the non-car mode share for travel to and from the site. This will entail an assessment of the accessibility of the development site by public and active transport.	Section 7.3.7 and Section 7.5.4 Appendix J TIA
TfNSW requires an assessment of the likely toxicity levels of loads transported on arterial and local roads to / from the site and, consequently, the preparation of an incident management strategy for crashes involving such loads, if relevant.	Not Applicable. The Proposal would only transport dry recyclable waste to and from site and thus would not be transporting any materials classified as dangerous or toxic under the Australian Dangerous Goods (ADG) Code (National Transport Commission, 2018).
TfNSW will require in due course the provision of a traffic management plan for all demolition / construction activities, detailing vehicle routes, number of trucks, hours of operation, access arrangements and traffic control measures.	Section 7.6 Appendix J TIA
Canterbury-Bankstown City Council	
It is important to ensure that the proposed significant increase in capacity can be adequately serviced by existing or potential road infrastructure, flood works and any other infrastructure required to service the increased intensity.	Section 7.5.4 (roadway capacity) Appendix J TIA
A detailed traffic management plan be required including the type of vehicles being utilising, with the tare and gross vehicle mass determined. This information is then to be incorporated into equivalent axle impact report of the receiving road network. Given the amount of material entering and leaving the site it is not considered that a simplistic summation of the number of "trucks" is sufficient, as axle loads can vary greatly dependent on the type of truck and trailer configuration adopted.	Section 7.6 (traffic management) Section 4.5.6 (vehicle types and weights) Appendix J TIA
The Heavy Vehicle routes shall be determined and approved by the relevant authority for accessing the site.	Section 7.2.1 (heavy vehicle routes)

Aspect	Where Addressed
The internal circulation, operation of the site, access to weigh bridges, proposed and existing, needs to be defined	Section 2.6 (existing site features) Section 4.3 and 4.5 (proposed operational features) Section 7.5.6 (internal circulation)

7.2 Methodology

The following steps have been followed to identify the potential traffic impacts on the surrounding road network associated with the Proposal:

1. Define the extent of the road network potentially impacted by the Proposal (the road network)
2. Define the roadway capacity for each road within the road network
3. Determine the existing traffic volumes and turning movements for key intersections
4. Define the performance levels (measured via level of service (LoS)) for key intersections
5. Quantify the vehicle movements likely to be generated by the Proposal
6. Identify the assessment scenarios to be used to determine potential traffic impacts in the future
7. Assess the impact of the Proposal against the assessment scenarios.

In addition to the above steps that have been followed to determine the impact on the surrounding road network, the assessment includes consideration of access and circulation within the Proposal site, as well parking and public transport access.

7.2.1 Defining the road network

With the M4 Motorway and M5 Motorway located north and south of the Proposal site, and the Hume Highway and Rookwood Road located in the east and west, the Proposal site is surrounded by a network of arterial and regional roads which are well connected. Once vehicles have entered the arterial road network, they are assumed to no longer be likely to have the potential to materially impact the operation of the network. The key roads within the road network considered to have potential to be impacted by the Proposal are in detail in Section 7.3.1, and comprise (refer Figure 7-1):

- Hume Highway
- Rockwood Road
- Muir Road
- Brunker Road
- Anzac Street.



LEGEND

- Chullora RRP site boundary
- Proposal site
- Future stage
- Flood detention basin
- Established earthworks
- Existing car parking area
- Existing site office
- Cooks River stormwater canal
- Landscaping area
- Vegetated area
- Local road network
- Automatic tube count
- Traffic movement count

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Coordinate System: GDA 1994 MGA Zone 56
Date issued: August 3, 2020
Aerial imagery source: nearmap Jan 2020

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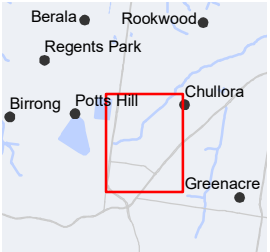


Figure 7-1: Local road network and survey locations

7.2.2 Roadway capacity

The capacity of a road refers to the number of vehicles that a road can physically accommodate. It is generally accepted that on a two-way divided road, the operational capacity can be as high as 1,900 passenger car units (pcu) per hour per lane. Table 7-3 below provides the operational capacity for urban roads extracted from the, then, Roads and Traffic Authority (RTA) (2002) “Guide to Traffic Generating Developments” (the Guide). Each of the key roads accessing the Proposal site were evaluated against the criteria in Table 7-3 to determine their current and future capacity. Analysis was then completed to determine the Proposal’s potential to impact the capacity of each road (refer Section 7.5.2).

Table 7-3 Typical mid-block capacities for urban roads with interrupted flow

Type of road	One-way mid-block land capacity (pcu/hr)	
Median or inner lane	Divided road	1000
	Undivided road	900
Outer or kerb lane	With adjacent parking lane	900
	Clearway conditions	900
	Occasional parked cars	600
4 lane undivided	Occasional parked cars	1,500
	Clearway conditions	1,800
4 lane divided	Clearway conditions	1,900

7.2.3 Determine existing traffic conditions

Traffic turning movement surveys were undertaken on 5 December 2019 during the weekday AM and PM road network periods at nearby key intersections to determine existing levels of traffic across the road network. Surveys were undertaken during a time considered to be reflective of normal operating conditions for the road network. These are shown in Figure 7-1 and include:

- Hume Highway / Muir Road
- Hume Highway / Brunker Road / Rawson Road
- Rookwood Road / Brunker Road
- Rookwood Road / Muir Road
- Muir Road / Worth Street.

Automatic tube counts (ATC) were undertaken on Hume Highway, Muir Road and Rookwood Road to capture traffic flows across a 24-hour, seven-day period.

7.2.4 Intersection performance

The existing operation of the nearby intersections within the road network was determined using SIDRA Network version 8.0; a computer-based modelling package which assesses intersection performance under prevailing traffic conditions. SIDRA calculates intersection performance as a LoS. SIDRA provides analysis of the operating conditions which can be compared to the performance criteria set out in Table 7-4 below.

Table 7-4 Level of service criteria for intersection operation

Level of service (LoS)	Average delay (seconds per vehicle)	Traffic, signals, roundabout	Give way and stop signs
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29-42	Satisfactory	Satisfactory, but accident study required
D	43-56	Operating near capacity	Near capacity and accident study required
E	57-70	At capacity, at signals, incidents will cause excessive delays, roundabouts require other control mode	At capacity, requires other control mode
F	Greater than 71	Unsatisfactory with excessive queuing	Unsatisfactory with excessive queuing: requires other control mode

7.2.5 Traffic generation rates

Under the ISEPP, the Proposal is considered a ‘traffic-generating development’ and as such an assessment of the impact of traffic associated with the future operation of the Proposal is required (refer Section 5.4.2).

Generally, the Guide is used as a tool to determine future traffic generation rates for different developments. The Guide contains traffic generation rates for four industrial development types, namely, factories, warehouses and business parks. For each development type a traffic generation rate is assigned per m^2 of GFA. Whilst the Proposal could be considered a similar development type to factories and warehouses, traffic generation rates for the Proposal are not directly impacted by changes in the GFA. Rather, vehicle movements are influenced by the amount of waste throughput. Therefore, the application of the Guide’s traffic generation rates are not considered to be appropriate for the Proposal.

Instead traffic generation rates for the Proposal have been determined based on the anticipated daily waste volumes that would be received at the Proposal site. A detailed breakdown of the traffic generation rates per vehicle type is provided in Section 7.5.1.

A description of delivery and collection vehicle types and movements has also been presented in Section 4.5.6.

7.2.6 Assessment scenarios

To determine the potential impact on the surrounding road network, both in terms of roadway capacity and intersection LoS, the likely traffic distribution, and a number of traffic generation scenarios were identified.

Traffic distribution

Due to the range of waste streams and output products associated with the Proposal it is expected that delivery / collection trucks would generally have origins and destinations across Sydney. However, as the origins of waste streams are based on contracts which are yet to be established the exact origins are unknown. As such, an even distribution from across Sydney has been assumed. This is considered to be a worst-case scenario as in reality, trucks would preference intersections with better levels of service. The distribution of traffic coming to, and from, the Proposal site have therefore been assumed to be as follows:

- To Proposal site (see Figure 7-2 below):
  - Half (50 per cent) of all vehicles would approach the Proposal site from the Hume Highway. Half of these (25 per cent of the total) would approach from the north and the other half (25 per cent of the total) from the south
  - The other half (50 per cent) of all vehicles would approach the Proposal site from Rookwood Road. Half of these (25 per cent of the total) would approach from the north and the other half (25 per cent of the total) from the south.
- Away from the Proposal site (see Figure 7-3 below):
  - All vehicles would turn left out of the Proposal site onto Muir Road
  - Half (50 per cent) of all vehicles would then undertake a U-turn at Muir Road - Dasea Street roundabout and travel eastbound towards the Hume Highway. Half of these (25 per cent of the total) would travel northbound and the other half (25 per cent of the total) would travel southbound on Hume Highway
  - The remaining half (50 per cent) would continue westbound towards Rookwood Road. Half of these (25 per cent of the total) would travel northbound and the other half (25 per cent of the total) would travel southbound on Rookwood Road).

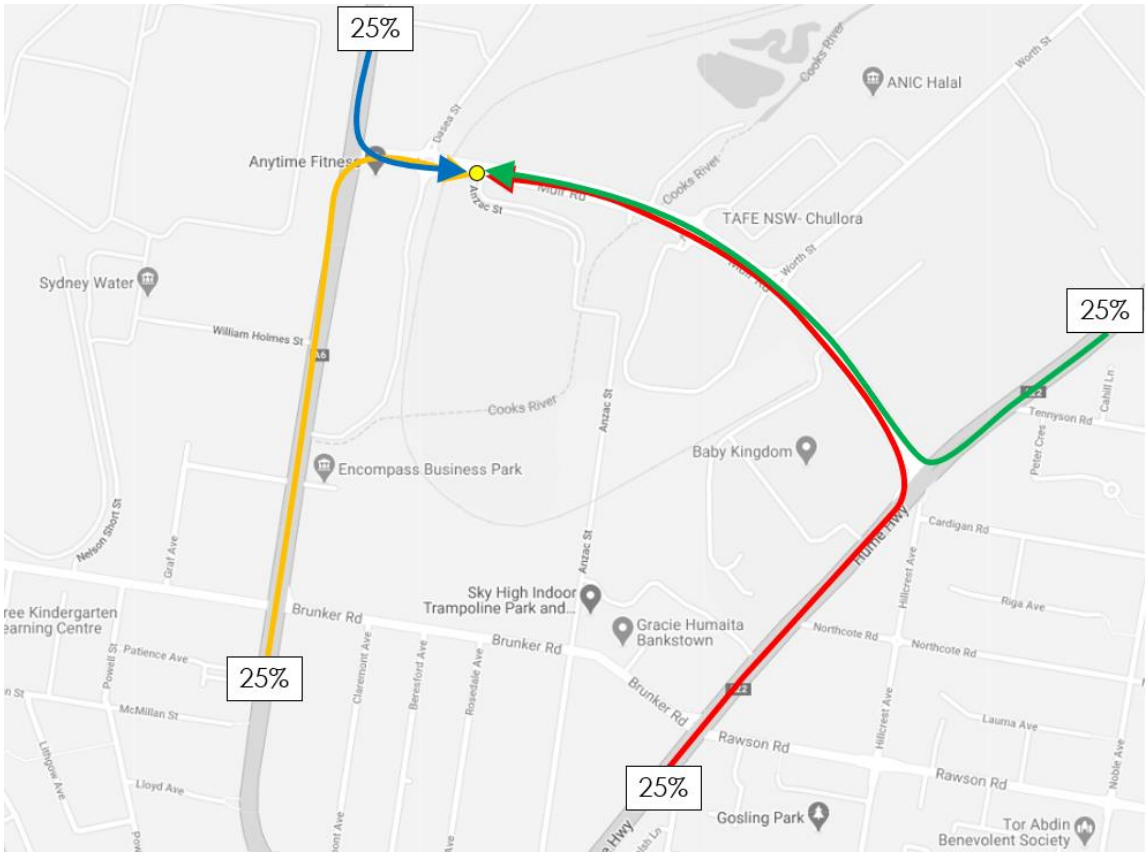


Figure 7-2 Inbound traffic distribution

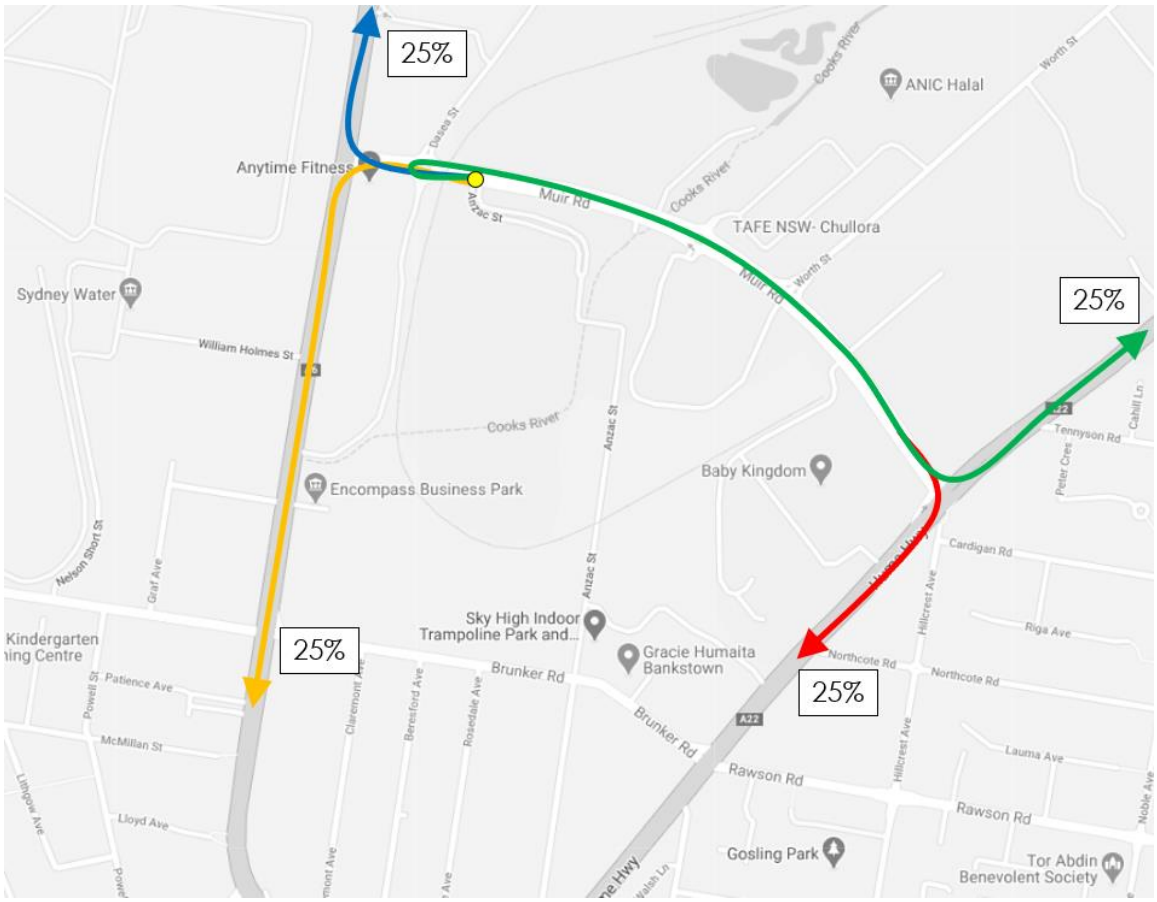


Figure 7-3 Outbound traffic distribution

Operational traffic scenarios

Peak operational traffic flows have been modelled using SIDRA software to assess the 'worst case' scenario that is likely to be generated by the Proposal. Based on the traffic distribution assumptions outlined above, modelling of existing and future conditions have been assessed across the following scenarios:

- Scenario 0 - Existing conditions ("Base case")
- Scenario 1 - Future conditions with background traffic growth up to the year 2022 (i.e. no site-generated traffic)
- Scenario 2 – Future conditions with background traffic growth up to the year 2022 plus site-generated traffic
- Scenario 3 – Future conditions with background traffic growth up to the year 2032 (i.e. no site-generated traffic)
- Scenario 4 - Future conditions with background traffic growth up to the year 2032 plus site-generated traffic.

To determine the growth in background traffic for the future modelling scenarios, data has been extrapolated from the Sydney Strategic Traffic Forecasting Model (STFM) growth plots obtained from TfNSW. The STFM growth plots provide growth rates (per cent per annum growth) from 2016 to 2026 and are based on approved developments in Sydney.

7.2.7 Parking provisions

The SEPP (State and Regional Development) stipulates that Council's DCPs do not apply to State significant developments (refer Section 5.4.1). However, the provision for car parking of the proposed development has been assessed in accordance with the Bankstown DCP (refer Section 5.5.2). The Bankstown DCP does not stipulate parking rates for material recycling facilities exclusively but does specify rates for industries / light industries.

According to Section 7.9 of the Bankstown DCP, car parking must be provided at the rate of one car parking space per 100 m^2 for mezzanine floor space where mezzanine floor space does not exceed 20 per cent of gross floor area of the unit. The Proposal is proposed to have a GFA of 9,886.2 m^2, which would result in a parking requirement of approximately 100 car parking spaces. In comparison to the number of staff to be employed at the MRF (45 employees), provision of 100 car parking spaces would be excessive.

A more appropriate method of estimating parking demand likely to be generated by the Proposal would be by using a 'first principles' approach. First principles use a parking rate based on the maximum number of employees at the facility at any given time rather than floor area. The parking assessment provided in Section 7.5.5 has therefore been based on first principles to understand the parking demand requirements of the Proposal.

7.3 Existing environment

7.3.1 Surrounding road network

The key surrounding road network providing access to and from the Proposal site includes (refer Figure 7-1):

- **Hume Highway (A22):** The Hume Highway (A22) is classified as a state road which runs in a north-south direction to the east of the Proposal site. The Hume Highway is a six-lane road with opposing directions divided by a 4 m wide raised median. The road has a speed limit of 70 km/hr and functions as a clearway at all times within the vicinity of the Proposal site
- **Rockwood Road/ A6**: Rockwood Road is a state road which has a north-south configuration and is located to the west of the Proposal site. Rockwood Road is a six-lane road with three lanes in each direction. The speed limit on Rockwood Road is 80 km/hr
- **Muir Road**: Muir Road is a local road which runs in an east-west direction and formed the northern boundary to the Proposal site. Muir Road is a four-lane road (one through lane and one parking lane per direction) and has a speed limit of 60 km/hr
- **Brunker Road**: Brunker Road is a State Road with an east-west alignment towards the south of the Proposal site. Brunker Road is a four-lane road with 3 m wide travel lanes in each direction and a speed limit of 60 km/hr
- **Anzac Street**: Anzac Street is both a local and private “NO THROUGH” street which runs in a north-south direction through the Proposal site. The road is a two-way street with kerbside parking on both sides and a speed limit of 50 km/hr.

All roads, with the exception of Anzac Street, are approved for heavy vehicles up to 25 / 26 metre B-doubles (General Mass Limit (GML)). Anzac Street would only be used by light vehicles.

7.3.2 Traffic volumes

Using traffic turning movement surveys and ATC data captured during the traffic surveys (as described in Section 7.2.3) peak traffic flows have been identified as shown in Figure 7-4. Morning (AM) peak traffic volumes are indicated in blue while afternoon (PM) peak traffic volumes are represented in orange.

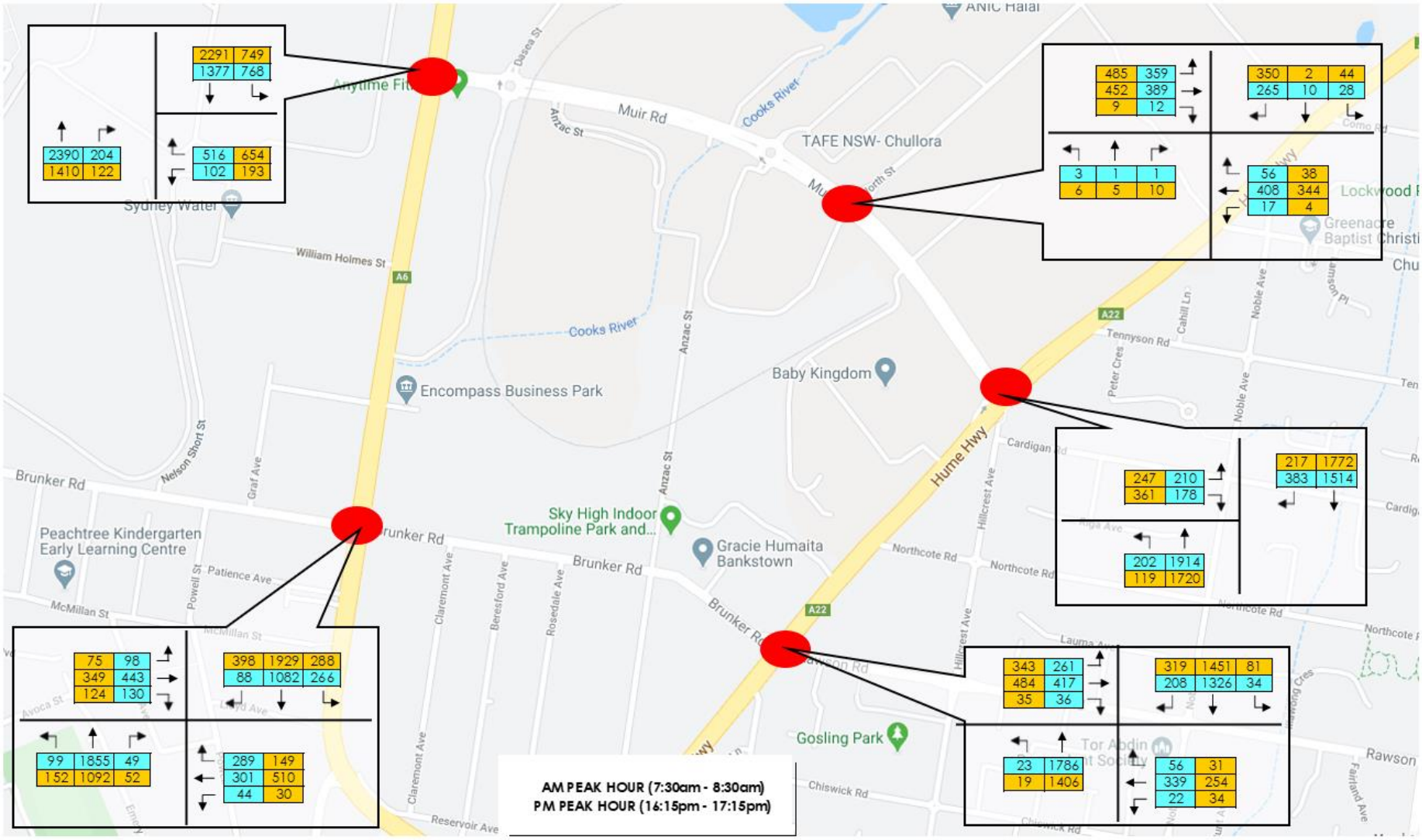


Figure 7-4 Traffic turning movements. Orange = AM peak hour, Blue = PM peak hour

7.3.3 Roadway capacity

Within the vicinity of the Proposal site, the Hume Highway and Rookwood Road are two-way divided urban roads with three lanes in each direction under clearway conditions. Muir Road is a two-way divided urban road with two lanes in each direction (one through lane and one parking lane). On 5th December 2019, traffic movements across a 24-hour, seven-day period were captured on these roads.

The operational capacity of a road is the number of vehicles that a road can accommodate with a low risk of flow breaking down. To assess the operational capacity of these roads, the number of light vehicles and heavy vehicles have been converted to a uniform unit of measure; pcu's.

The average daily flows on Hume Highway, Rookwood Road and Muir Road were identified.

In regard to the Hume Highway (two-way flows), the maximum pcu per hour on the Hume Highway is approximately 2,700 in the eastbound direction between 7:00 am and 8:00 am. The Hume Highway provides three traffic lanes in each direction which is approximately 900 vehicles per lane which is close to the typical capacity limit of 900-1000 vehicles per lane (Figure 7-5).

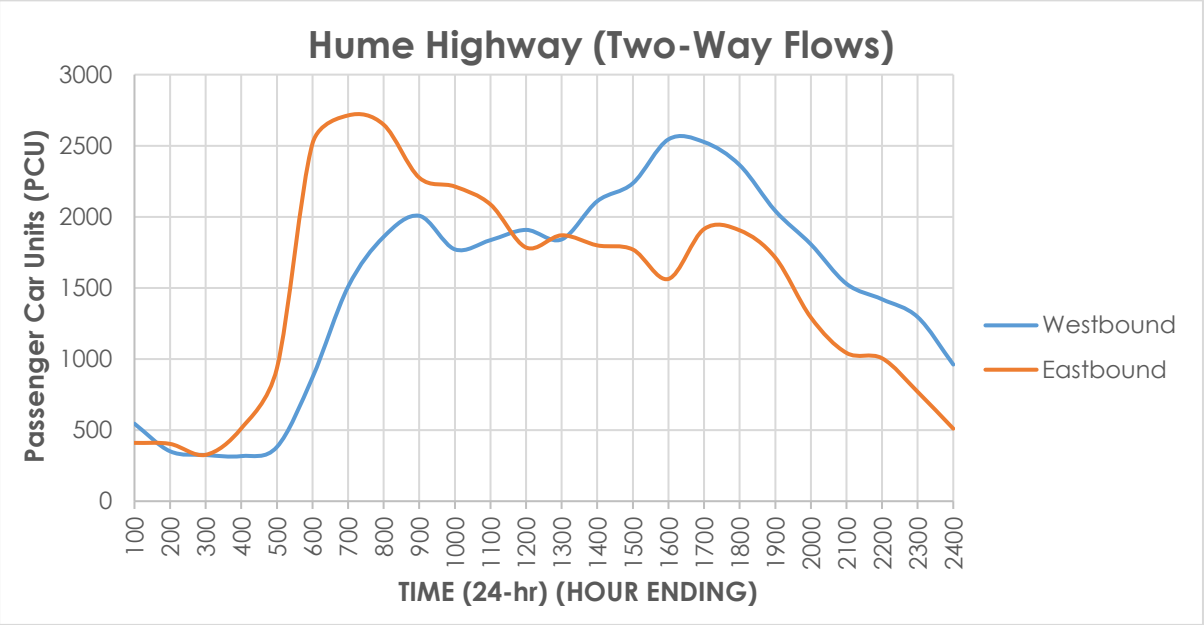


Figure 7-5 Hume Highway traffic flow

In regard to Rookwood Road (two-way flows) the maximum pcu per hour is approximately 3,100 in the northbound direction (citybound) between 7.00am – 8.00am. As Rookwood Road also provides three lanes in each direction, this corresponds to approximately 1033 vehicles per lane which is about the typical capacity which is 900-1000 vehicles per lane (Figure 7-6).

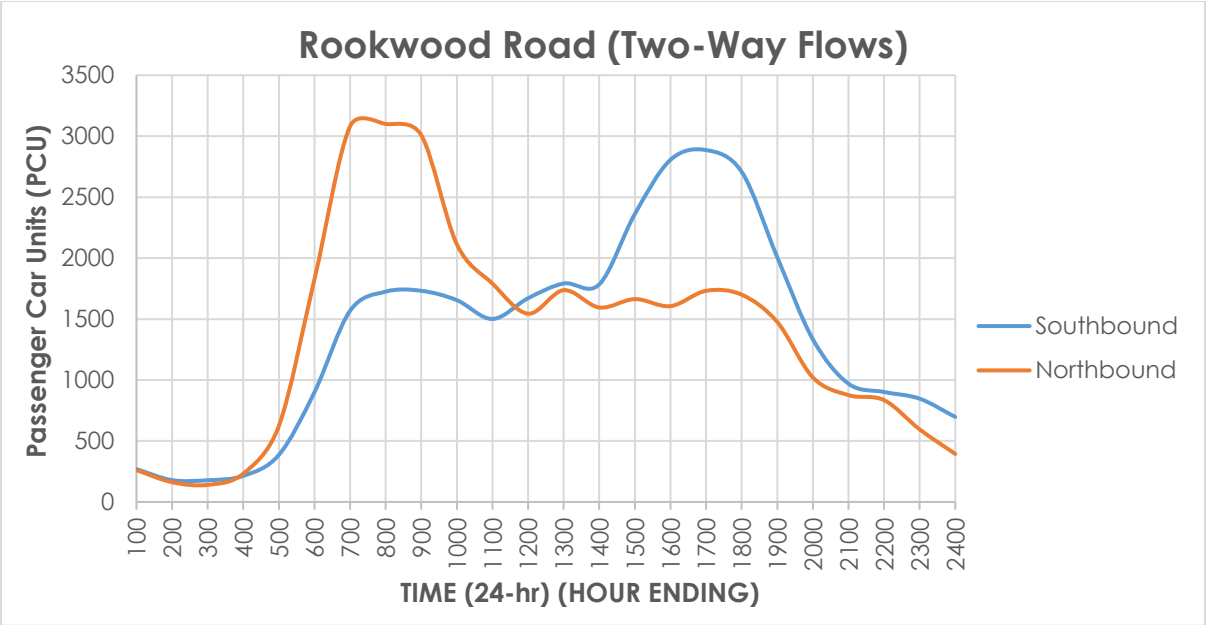


Figure 7-6 Rookwood Road traffic flow

In regard to Muir Road (two-way flows), the maximum pcu per hour is approximately 1,050 in the eastbound direction between 8.00am – 9.00 am. This is marginally above the typical capacity for an inner lane on a divided lane. Muir Road generally provides one traffic lane and one parking lane in each direction. The typical mid-block capacity would be approximately 1,000 pcu per lane (Figure 7-7).

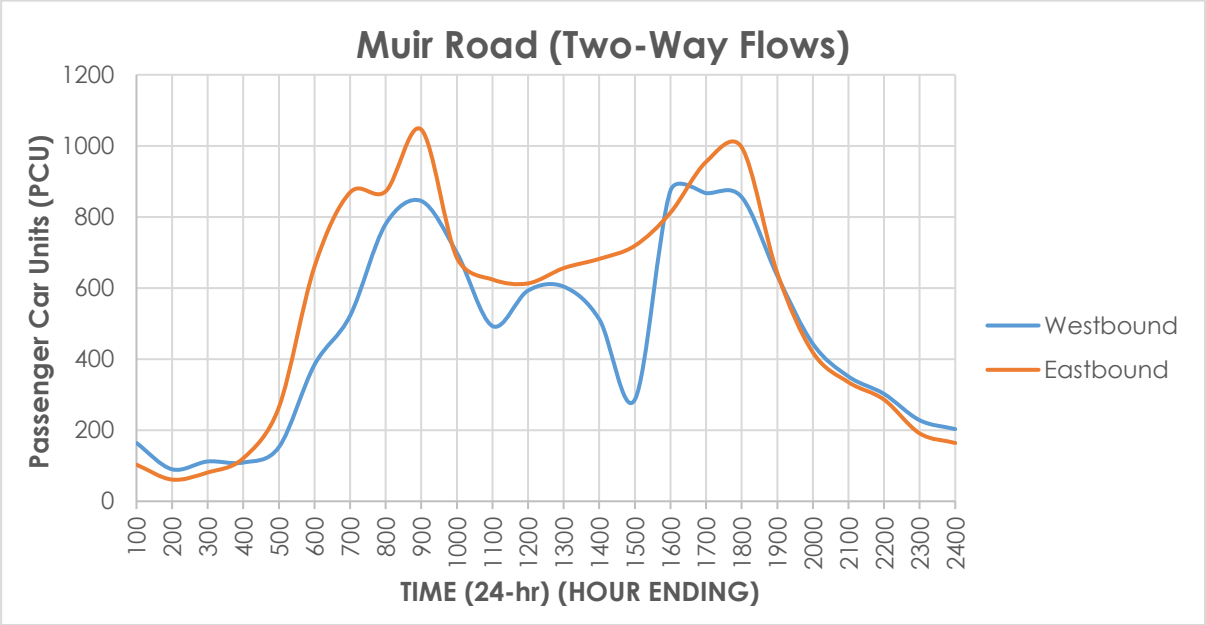


Figure 7-7 Muir Road traffic flow

7.3.4 Intersection performance

The operational levels of service in each scenario during the AM peak and PM peak periods are summarised in Table 7-5 below. Signalised intersections along Muir Road currently operate at an acceptable level of service C or better, while signalised intersections at Brunker Road operate at a poor level of service E or F in both peak periods.

Table 7-5 Existing intersection operation

Intersection	AM Peak		PM Peak	
	Average delay	Level of service	Average delay	Level of service
Hume Highway/ Brunker Road	62s	E	59s	E
Hume Highway/ Muir Road	13s	A	20s	B
Muir Road/ Worth Street	23s	B	23s	B
Rookwood Road/ Muir Road	22s	B	37s	C
Rookwood Road/ Brunker Road	82s	F	173s	F

7.3.5 Vehicle access and on-site parking

Vehicle access to the Proposal site is provided via Muir Road, which has been recently upgraded, for heavy vehicles and Anzac Street for light vehicles. Ingress and egress movements via Muir Road are separated by a raised median. The width of the access driveway is approximately 50 m. Historically, this access point has been used by heavy vehicles servicing the site.

Anzac Street provides access to the existing car park. Light vehicles accessing the SUEZ office currently utilise the car park which comprises 70 car parking spaces.

7.3.6 Public transport

The Proposal site is primarily served by bus services. The closest railway station is Birrong, located approximately 1.5 km west of the Proposal site. Bus stops are provided along Rookwood Road, Hume Highway and Muir Road. The following bus routes service the Proposal site:

- 925 – East Hills to Lidcombe via Bankstown
- M92 – Sutherland to Parramatta.

Bus routes in the vicinity of the Proposal site are shown Figure 7-8 below.

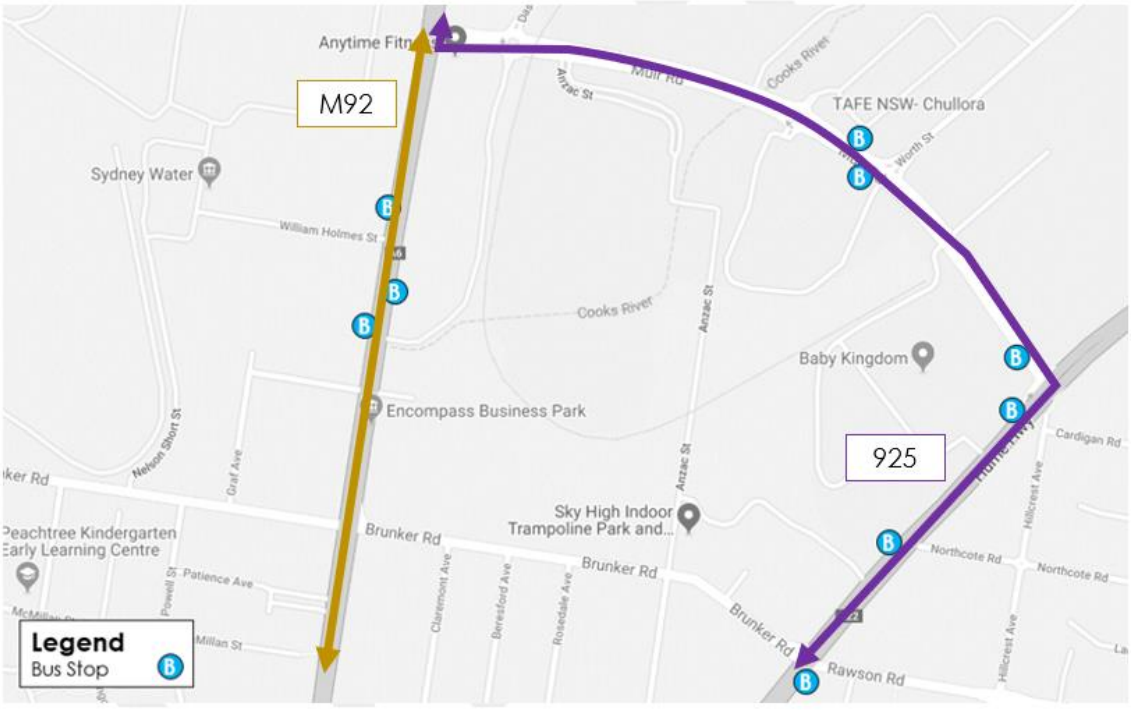


Figure 7-8 Nearby bus stops surrounding the Proposal site

7.3.7 Pedestrian and cyclist facilities

Pedestrian footpaths are provided alongside all roads within the vicinity of the Proposal site. Kerb ramps and marked foot crossings are located on most legs of nearby signalised intersections. Cycling in the vicinity of the Proposal site is generally not observed.

7.4 Construction impacts

7.4.1 Construction traffic volumes

Construction of the Proposal would comprise the construction of the MRF across three stages (refer Section 4.4.1):

- Stage 1: Establishment of a hardstand area and internal road network
- Stage 2: Construction of the MRF and installation of fixed plant and equipment
- Stage 3: Installation of ancillary facilities, commissioning, and demobilisation.

Construction is proposed to commence late 2021 and is anticipated to take approximately 12 months to complete. Heavy vehicles would be utilised to transport building materials to site. The vehicle movements associated with each stage of construction are presented in Table 7-6 below. Vehicles would mostly be medium and heavy rigid vehicles.

As can be seen from Table 7-6, Stage 1a would generate the greatest number of vehicle movements per day; totalling approximately 16 movements.

Table 7-6 Construction staging and traffic generation

Stage	Daily Heavy Vehicles	Daily heavy vehicle movements
Stage 1a	8	16
Stage 1b	5	10
Stage 1c	3	6

7.4.2 Construction traffic impact

The traffic generated during construction phase is considered minimal and would be significantly less than during peak operation. Operational traffic impacts are assessed in Section 7.5 and were found to cause a negligible impact on the surrounding road network. Therefore, any impact due to construction vehicles during the road network peak periods is also expected to be minimal and would have no noticeable impact on the local road network, either in terms of roadway capacity or intersection performance.

7.4.3 Construction staff parking

Construction would require up to 30 personnel on-site at any one time. Personnel would be able to use the existing off-street car park within the broader Chullora RRP site.

Commuting by public transport, and active transport for those residing nearby would be encouraged amongst construction workers.

7.5 Operation impacts

7.5.1 Traffic generation

Section 4.5.6 provides a description of the waste disposal and collection vehicles that would access the Proposal site during operation. Two-way vehicle trips were estimated to be generated by the Proposal during peak operation. The Proposal site's peak operational period would be expected to occur between 4:00 am – 5:00 am and 12:00 pm – 1:00 pm.

As described in Section 4.5.6 the types of vehicles that may access the Proposal site would include:

- Delivery vehicles (inbound)
  - Medium rigid vehicle (MRV) (8.8 m)
  - Walking floor trailers (19 m)
- Product collection vehicles (outbound)
  - Semi-trailers and triple axle vehicles (19 m)
  - Truck and dogs (19 m)
  - B-double trucks (25 m)

A full breakdown of vehicle movement across the day has been provided in Section 4.2 of the TIA (Appendix J). To determine impacts on the road network the peak hour traffic generation rates have been assessed.

Vehicles types, as well as average hourly and peak hourly movements are presented in Table 7-7 and Table 7-8 respectively. The vehicle mix, including the types and proportions of each type used to estimate operational traffic generation is based on data from the previous MRF at the Proposal site and SUEZ's experience on similar projects.

It is noted that to provide a conservative estimate of traffic numbers it has been assumed that product would be collected by semi-trailers and truck-and-dogs only. B-doubles may also access the Proposal site to collect product. Due to the higher capacity of B-doubles this would therefore reduce the total number of required vehicles.

Table 7-7 Average day operational traffic generation during the peak hours

Vehicle type	AM peak hour		PM peak hour	
	Delivery vehicle movements	Collection vehicle movements	Delivery vehicle movements	Collection vehicle movements
MRV	3	0	2	0
Walking floor trailers	0	2	0	1
Semi-trailer vehicles	2	0	1	0
Truck and dog vehicles	0	0	0	0
Total movements	**10**	**4**	**6**	**2**

Table 7-8 Peak day operational traffic generation during the peak hours

Vehicle type	AM peak hour generation		PM peak hour generation	
	Delivery vehicle movements	Collection vehicle movements	Delivery vehicle movements	Collection vehicle movements
MRV	4	0	3	1
Walking floor trailers	0	2	0	1
Semi-trailer vehicles	2	0	1	0
Truck and dog vehicles	0	0	0	0
Total movements	**12**	**4**	**8**	**2**

7.5.2 Operational traffic impact

Peak day operational traffic flows have been modelled using SIDRA software to assess the 'worst case' scenario resulting from traffic generated by the Proposal across a number of existing and future traffic scenarios (refer Section 7.2.6). Table 7-9 and Table 7-10 below provide a summary of the road network performance during AM and PM road network peak periods, respectively.

By comparing future scenarios of background traffic growth along with site-generated traffic, it is evident that the Proposal would cause an additional 0-1 second intersection average delay. This would have an unnoticeable effect on intersection operation, and thus, the Proposal would have an insignificant impact on surrounding road network performance.

Further, almost all intersections currently operating at an acceptable LoS A to C continue to operate as such across future scenarios, with the exception of Rookwood Road-Muir Road. In the PM peak period, this intersection's LoS would reduce from LoS C to LoC D in 2022, and LoS F in 2032. It is noted however that between existing conditions (Scenario 0) and future year 2022 (Scenario 1), the intersection average delay would increase by six seconds as a result of background traffic growth.

Scenario 2 (with the Proposal) would result in no increase in delay above background traffic, and therefore this deterioration in LoS for this intersection is not attributable to the Proposal.

Between future years 2022 (Scenario 1) and 2032 (Scenario 3), the Rookwood Road-Muir Road LoS would reduce from LoS D to LoS F with an additional 39 seconds to the intersection average delay. This suggests that future traffic growth would cause the intersection to operate over capacity by 2032. When site-generated traffic is added to the intersection network in 2032 (Scenario 4), there would be no change to the intersection average delay. Therefore, any impact caused by the Proposal would also be negligible.

Considering the background traffic growth in the area surrounding the Proposal site, the Proposal would generate a minor impact on the road network performance as modelled in the scenarios.

Table 7-9 Modelling results - AM Peak

Intersection	Scenario 0 (Existing conditions)		Scenario 1 (2022 conditions – no Proposal)		Scenario 2 (2022 conditions – with Proposal)		Scenario 3 (2032 conditions – no Proposal)		Scenario 4 (2032 conditions – with Proposal)	
	Ave Delay	LOS	Ave Delay	LOS	Ave Delay	LOS	Ave Delay	LOS	Ave Delay	LOS
Hume Highway / Brunker Road	62	E	67	E	67	E	93	F	93	F
Hume Highway / Muir Road	13	A	13	A	13	A	18	B	18	B
Muir Road / Worth Street	23	B	23	B	23	B	23	B	23	B
Rookwood Road / Muir Road	22	B	23	B	24	B	32	C	33	C
Rookwood Road / Brunker Road	82	F	92	F	93	F	151	F	152	F

Table 7-10 Modelling results - PM Peak

Intersection	Scenario 0 (Existing conditions)		Scenario 1 (2022 conditions – no Proposal)		Scenario 2 (2022 conditions – with Proposal)		Scenario 3 (2032 conditions – no Proposal)		Scenario 4 (2032 conditions – with Proposal)	
	Ave Delay	LOS	Ave Delay	LOS	Ave Delay	LOS	Ave Delay	LOS	Ave Delay	LOS
Hume Highway / Brunker Road	59	E	60	E	60	E	69	E	69	E
Hume Highway / Muir Road	20	B	20	B	20	B	23	B	23	B
Muir Road / Worth Street	23	B	23	B	23	B	26	B	26	B
Rookwood Road / Muir Road	37	C	43	D	43	D	82	F	82	F
Rookwood Road / Brunker Road	173	F	188	F	187	F	253	F	254	F

7.5.3 Turning lane storage capacity

Site-generated traffic would result in additional vehicles turning left and right at the intersections of Rookwood Road-Muir Road and Hume Highway-Muir Road. An analysis of storage capacity for turning lanes into Muir Road has been undertaken to identify any impact to the through movement on Rookwood Road and Hume Highway, as shown in Table 7-11.

Within the modelled future scenarios, the Proposal site is expected to result in minimal additional queue length to left-turn and right-turn movements on nearby major roads.

The exception to this is in Scenario 4 (2032 Conditions with Proposal) for the left-turn movement from Rookwood Road to Muir Road in the AM peak period. In this scenario, there would be an additional queue length of 11.1 m (between 1 – 2 car lengths). An additional 1-2 car lengths to the queue is considered minor and would not result in an adverse impact to the intersection operation.

It is noted that for the left-turn movement from Rookwood Road to Muir Road in the AM peak period the queue length overflows from the short lane of 70 m. Under existing conditions, the queue length is 79.5 m. For future background traffic growth scenarios in 2022 and 2032 (Scenario 1 and Scenario 3, respectively), the queue length can be up to 192 m. However, in all future scenarios the site-generated traffic would contribute less than two car lengths to the left-turn queue distance.

In comparison to the impact generated by background traffic growth, the Proposal site would have a minor contribution to queue distances at surrounding intersections.

Table 7-11 Turning lane queue lengths with and the Proposal (queues beyond lane length bolded)

Turning movement		Lane length (m)	Queue length				
			Scenario 0 (Existing conditions)	Scenario 1 (2022 conditions – no Proposal)	Scenario 2 (2022 conditions – with Proposal)	Scenario 3 (2032 conditions – no Proposal)	Scenario 4 (2032 conditions – with Proposal)
Rookwood Road / Muir Road AM	Left turn (heading south) from Rookwood Road onto Muir Road	70	**79.5**	**94.4**	**96.6**	**191.9**	**203**
	Right turn (heading north) from Rookwood Road onto Muir Road	90	25.4	27.8	28.8	41.6	43.7
Rockwood Road / Muir Road PM	Left turn (heading south from Rockwood Road onto Muir Road)	70	57.4	47.4	48.8	**70.8**	**72.1**
	Right turn (heading north from Rockwood Road onto Muir Road)	90	42.8	44.2	45.3	51.8	53.1
Hume Highway / Muir Road AM	Left turn (heading north from Hume Highway onto Muir Road)	90	7.7	8.9	9.1	12.9	13.2
	Right turn (heading south from Hume Highway onto Muir Road)	80	34.4	36.7	37.5	53.8	55.9
Hume Highway / Muir Road PM	Left turn (heading north from Hume Highway onto Muir Road)	90	4.9	5.4	5.6	7.8	8.0
	Right turn (heading south from Hume Highway onto Muir Road)	80	36.7	38.4	39.5	48.6	49.9

7.5.4 Roadway capacity and safety

The Hume Highway experience traffic flows which are under the operational capacity. The operational capacity limit for the Hume Highway is 900-1000 vehicles per lane. Rookwood Road and Muir Road, however, as specified previously, is at capacity. The Proposal would add up to 20 pcu's to Rookwood Road and Muir Road which could represent a daily variation in vehicle flow during the average week. It is expected that such a minor increase would not create any discernible effects on the typical capacity of the road.

Given that there would be no discernible effect to the typical capacity, safety would not be expected to reduce across the surrounding road network in the future. Traffic impacts due to the Proposal site operation are assessed to be minor. Also, the existing road infrastructure has capacity to absorb such minor impacts to the road network. On this basis, road upgrades, infrastructure works or new roads would not be required for the development.

7.5.5 Vehicle access and on-site parking

Site access queuing

As there is currently no significant activity occurring on the Proposal site, the traffic movements into and out of the Muir Road access point are minimal. Additional traffic movements from this access point would be generated by the operation of the Proposal. These movements are presented in Table 7-12.

Table 7-12 Muir Road site access vehicle movements

Truck Movement	AM Peak Hour	PM Peak Hour
Muir Road, left-in	6	4
Muir Road, left-out	4	2
Muir Road, right-in	6	4
Total Movements	**16**	**10**

SIDRA traffic modelling analysis of the site access indicates that the addition of the traffic movements from the Proposal would have a minor impact on queues into and out of the site. The Proposal is expected to generate queue lengths of less than one vehicle at the site access for all turning movements.

Car parking

The Chullora RRP would generate parking demand due to the operation of the Proposal as well as the continued use of the existing site office.

The existing site office operations are supported by up to 20 personnel at any given time. Therefore, the total parking demand for the Chullora RRP, including the existing site office operations and the Proposal (which would have a maximum of 45 personnel at any given time), would be a maximum of 65 car parking spaces. The existing car park currently has 70 parking spaces, providing excess parking spaces, even under a conservative assessment assuming all operational personnel of the MRF are parked onsite at one time.

It is noted that skeleton staff would be on-site between 9pm-4pm, which would not overlap with the two main employee shifts as mentioned above. The 30-minute break with employee shifts on either side would ensure there is minimal overlap between staff ending their shift with those beginning their shift. Nonetheless, any potential overlap would be accommodated on-site.

For bicycle parking provision rates, reference is made to the Austroads Guide to Traffic Management Part 11 Table 2C 6: Bicycle Parking Provisions. For industrial land uses, the recommended staff bicycle parking

provision is three to five per cent of staff. Applying an average of this range to the proposed 45 employees at the MRF, the allocation of bicycle parking would be approximately 10 staff spaces. As such, ten staff bicycle parking spaces would be accommodated within the site office in a secure locker room or equivalent space.

7.5.6 Internal circulation and stacking

The internal road layout of the Proposal is designed to accommodate forward movements by the largest vehicle accessing the Proposal site, that is, a 25 m B-double. Upon exit, all vehicles are required to turn left onto Muir Road as the right-turn movement from the Proposal site is not permitted due to the median on Muir Road. This is shown in Figure 7-9 below.

The roundabouts on Muir Road are designed as a pair such that sites fronting Muir Road can be restricted to left-in left-out movements yet have the ability to travel both east and west using one of the roundabouts to perform a U-turn. Therefore, site-generated vehicle U-turn movements would be in-line the function of the roundabout.

Driver sight distances on all approaches at the intersection of Muir Road and Anzac Street are adequate.

Once within the Proposal site all vehicles, including B-doubles, would be able to manoeuvre safely throughout the Proposal site within the need to reverse. Vehicles would only reverse onsite to tip waste within the receival area and would otherwise travel in a forward direction. A swept-path analysis has been prepared for all vehicle types accessing the Proposal site; and is presented in Appendix J of this EIS.

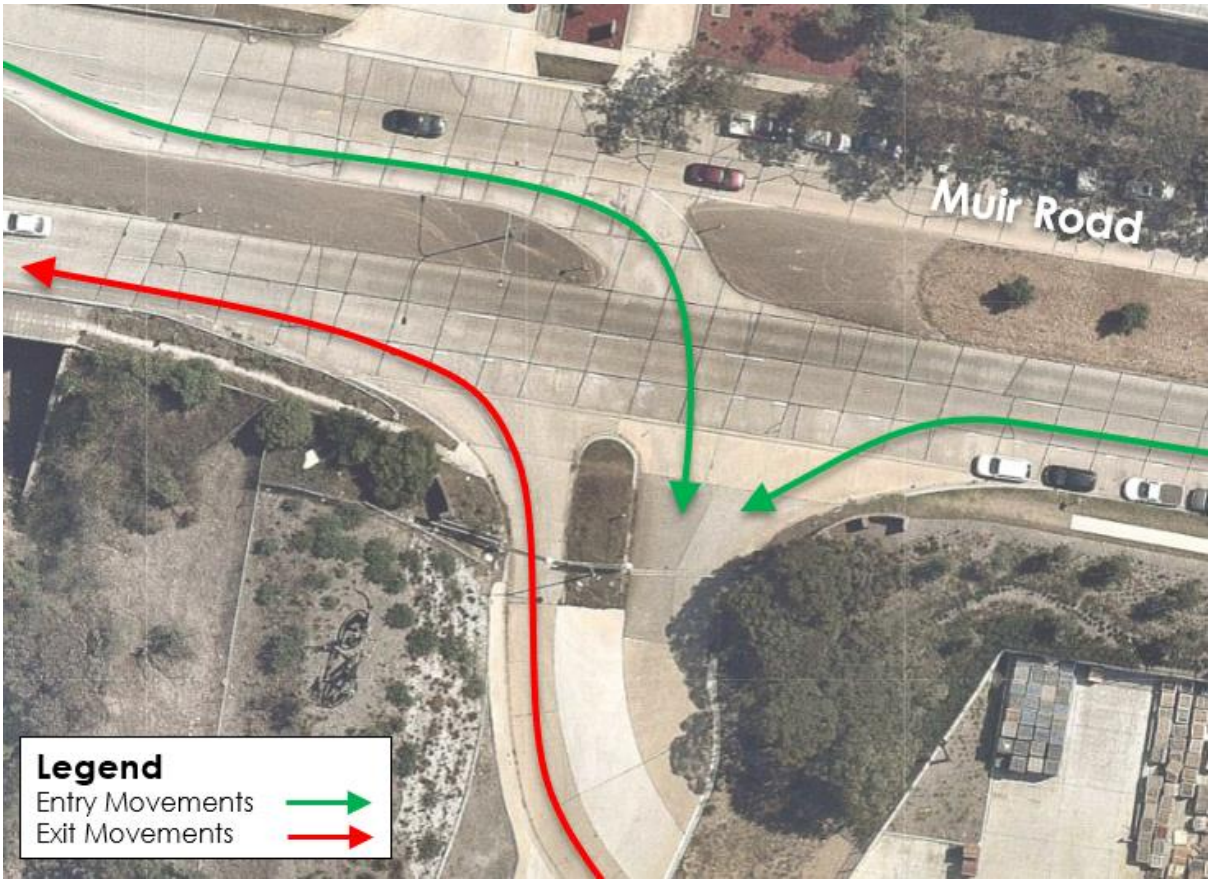


Figure 7-9 Access movements at intersection of Muir Road / Anzac Street

Parking and stacking spaces for trucks would be established and demarcated in the northern part of the Proposal site.

A stacking capacity analysis has been undertaken to determine whether all heavy vehicles accessing the site during peak operation can be fully accommodated on-site at the same time to ensure queuing in the road reserve would not result. The stacking capacity analysis is a factor of the number of stacking spaces available on-site and the turnaround time on-site per vehicle.

The driveway accessing 21 Muir Road includes two 100 m queueing lanes capable of stacking two heavy vehicles side by side and up to 20 vehicles in total. On-site traffic lanes would ensure that all heavy vehicles would be contained on-site. The assessment looked at the typical and worst-case peak operating conditions and the Proposal site has sufficient capacity in terms of stacking spaces to accommodate even the worst-case scenario.

The turnaround time is the duration one vehicle requires to complete all on-site activities. A breakdown of the time spent per activity whilst on-site is outlined in Table 7-13 and Table 7-14 for delivery and collection vehicles respectively.

Table 7-13 Waste delivery vehicle turnaround times

Activity	Medium rigid vehicles (MRV)	Semi-trailer
Truck weigh-in	1 min	1 min
Travel to product storage area	1-3 min	1-3 min
Vehicle loading	10 min	20 min
Travel to outbound weighbridge, truck weigh-out and site exit	4 min	4 min
Total time	18 min	28 min

Table 7-14 Product collection vehicle turnaround times

Activity	HRV	Truck and dog	B-double
Truck weigh-in	1 min	1 min	1 min
Travel to product storage area	1-3 min	1-3 min	1-3 min
Vehicle loading	20 min	20 min	30 min
Travel to outbound weighbridge, truck-weigh-out and site exit	4 min	4 min	4 min
Total Time	28 min	28 min	38 min

Based on the above, a truck would spend between 18 and 38 minutes on-site between entry and exit. It is noted that B-double vehicles, which would have the longest onsite turnaround time would predominantly access the site outside the Proposal site operational peak period. At such times, B-double vehicles would not be required to queue to enter the Proposal site.

The availability of stacking space on approach to the inbound weighbridges within the Proposal site would be able to sufficiently store 11 trucks expected to arrive during the site's peak hour. Hence, queuing of heavy vehicles would be entirely accommodated and managed on-site.

7.5.7 Pedestrian access

All vehicle and pedestrian routes within the Proposal site would be separated, and signposted and / or delineated as such. Pedestrian access would be restricted to those site personnel in charge of supervising operation. Personal Protective Equipment (PPE) must be worn by all persons when onsite.

The number of pedestrian movements throughout the site would be low and generally limited to the start / end of work shifts and during lunch hours. Within the actual MRF, elevated platforms would allow

personnel move through building and amongst fixed plant without having to go to ground level. A dedicated pedestrian overbridge would connect the car park directly into the site office mezzanine floor within the MRF. Therefore, interaction between vehicles and pedestrians across the site would be infrequent.

7.6 Mitigation measures

Traffic generated by the Proposal is not expected to compromise the safety or function of the surrounding road network. Rookwood Road, Muir Road and the Hume Highway are well equipped to withstand the traffic demand on the Proposal site. Table 7-15 outlines the mitigation measures that will be implemented by SUEZ to further minimise any traffic, access and parking impacts.

Table 7-15 Mitigation measures (traffic, access and parking)

ID	Mitigation measures	Timing
TA1	A CEMP, or equivalent, will be prepared to address the specific traffic control requirements during the construction phase of the Proposal. The plan will assess the provision of traffic control measures, including: • Site signage and road signage • Enforcement of speed limits for construction traffic • Site-internal pedestrian routes • Site induction for construction staff. The induction will include permitted access routes to and from the construction site for all vehicles, as well as standard environmental, occupational health and safety (OH&S), driver protocols and emergency procedures • Contracts outlining site traffic rules and traffic management requirements Scheduling of construction vehicles entering and exiting the site via Muir Road.	Construction
TA2	Site-specific Traffic Control Plans (TCPs) will be prepared as part of the CEMP to outline how construction vehicle manoeuvres will be accommodated in and out of the work site. Temporary traffic controls will be regularly inspected by the contractor to identify potential safety hazards to enable implementation of the correct solutions.	Construction
TA3	An OTMP will be prepared to address the specific traffic control requirements during the operational phase of the Proposal. The plan will assess the provision of traffic control measures, including: • Site signage and road signage • Enforcement of speed limits • Site-internal pedestrian routes • Scheduling processes.	Operation

Conclusion

TTPP have undertaken an assessment of the traffic, access and parking impacts associated with the Proposal. The assessment found that traffic generated by the Proposal is not expected to compromise the safety or function of the surrounding network.

Impacts during the construction phase of the Proposal are expected to be minimal and would have no noticeable impact on the local road network. Impacts during the operational phase of the Proposal would cause an additional 0-1 second to intersection average delay due to on-site generated traffic, which is not expected to have a significant impact on surrounding road network performance. The Proposal site can accommodate the movements of all vehicles safely, and the existing car park has sufficient spaces to accommodate the increase in light vehicle parking demand associated with the Proposal.

8 AIR QUALITY AND ODOUR

Summary

Katestone Environmental Pty Ltd (Katestone) have prepared an Air Quality Impact Assessment (AQIA) to assess the air quality and odour impacts associated with the Proposal. This assessment addresses the SEARs issued by the NSW DPIE as they relate to air quality.

This assessment was undertaken in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (Approved Methods)* (NSW EPA, 2016b) which lists the statutory methods for modelling and assessing emissions of air pollutants of major projects.

The key emissions to air identified as potentially arising from the Proposal include combustion gases (nitrogen dioxide (NO_2), sulphur dioxide (SO_2), carbon monoxide (CO), volatile organic compounds (VOCs), and particulates ($PM_{2.5}$, PM_{10} and total suspended particles (TSP)), dust and odour. These pollutants are anticipated to be generated during the following activities:

- Wheel generated dust from transport of incoming and outgoing waste along the sealed road to and from the MRF
- Dust due to screening, shredding, crushing and other material transfers within the MRF
- Emissions of exhaust pollutants including NO_2, SO_2, CO and particulates from vehicle movements on-site and mobile equipment within the MRF.

Ambient pollutant concentrations were identified using datasets from the Chullora monitoring station and the Bureau of Meteorology's (BoM's) Sydney Airport station for the period 2015-2019. All relevant pollutants were shown to be below the relevant criteria levels except for 24-hour maximum concentrations for $PM_{2.5}$ and PM_{10} which were shown to exceed the criteria on a number of days each year.

As the construction of the Proposal would not require earthworks, emissions to air during the construction would be minor.

The operational impacts of the Proposal were assessed in regard to $PM_{2.5}$, PM_{10}, NO_2, SO_2, CO, VOCs, dust, and odour. The results demonstrated that the operation of the Proposal would not result in any additional days of exceedance for $PM_{2.5}$ and PM_{10} concentrations and for 24-hour maximum concentration days would only contribute 0.5 per cent and 0.2 per cent of the total concentrations, respectively. The ground level concentrations of NO_2, SO_2, CO and VOCs were all found to comply with the relevant criteria.

The incoming waste received at the Proposal site during operation is not anticipated to be highly odorous on the basis it would not typically contain putrescible waste. However, it is possible that small amounts of incoming waste may be odorous, depending on the source of the waste, its cleanliness and storage prior to arrival at the MRF. The results from the odour assessment demonstrated that the ground-level odour concentrations resulting from the Proposal are predicted to comply with the odour criteria at all sensitive receptor zones.

Air quality management features such as a misting system, enclosed processing and transfer areas and sealed haul roads have been included within the proposed design to proactively manage the potential for impacts. The impacts to air quality during both the construction and operation of the Proposal are therefore considered negligible, resulting in no specific mitigation measures in addition to the Proposals numerous design air quality mitigation features being considered. All air quality related impacts will be managed through a CEMP and OEMP.

8.1 Introduction

Katestone Environmental Pty Ltd (Katestone) have undertaken an assessment of the potential air quality related impacts associated with the Proposal to address the SEARs issued by DPIE. The Air Quality Impact Assessment (AQIA) for the Proposal is provided in Appendix K of this EIS. Table 8-1 provides a summary of the relevant SEARs, which relate to air quality, and where these have been addressed in this EIS.

Table 8-1 SEARs (air quality and odour)

SEARs	Where addressed
Air quality	
A quantitative assessment of the potential air quality, dust and odour impacts of the development in accordance with relevant Environment Protection Authority guidelines. This is to include the identification of existing and potential future sensitive receivers and consideration of approved and/or proposed developments in the vicinity.	Section 8.5 Appendix K AQIA
The details of buildings and air handling systems and strong justification (including quantitative evidence) for any material handling, processing or stockpiling external to a building.	Section 4.5.8 (design features) Section 8.5 Appendix K AQIA No material handling, processing or stockpiling would occur externally to the MRF
A greenhouse gas assessment	Chapter 17 Appendix R Greenhouse gas (GHG) assessment
Details of proposed mitigation, management and monitoring measures.	Section 4.3.1 and Section 4.5.8 Section 8.6 Appendix K AQIA

Further to the above, the EPA and Council require further details on specific requirements relating to their authority. These requirements are discussed throughout this EIS and are provided in Table 8-2 below.

Table 8-2 Other agency requirements and relevant report sections (air quality and odour)

Aspect	Where addressed
EPA	
Air quality including proposed mitigation measures to minimise the generation and emission of dust during the construction phase and proposed mitigation measures to prevent the generation and emission of dust during the operational phase.	Section 4.5.8 (design features) Section 8.5 (air quality impacts) Section 8.6 (proposed mitigation impacts) Appendix K AQIA
Management of odour and leachate resulting from the receipt of waste material contaminated with residual liquid and/or food waste. The Chullora Materials Recovery Facility Scoping Report (21 November 2019) states co-mingled material	Section 8.6 Appendix K AQIA

Aspect	Where addressed
from municipal waste sources will be processed at the Materials Recovery Facility. Municipal waste streams are subject to contamination from food and liquid containers increasing the potential of odour issues and leachate runoff at the Premises. The Proponent must include mitigation measures to manage odour and leachate.	
Council	
A detailed Air Quality and Odour Assessment is required on the potential impacts of the proposal on the surrounding environment. The previous waste management facility emitted significant odours from the site into the area. Given the intensity proposed, Council requires these odours to be managed on the site. The relevant odour management reports are to demonstrate how odours will be contained within the site through demolition, construction and ongoing use. A Construction Management Plan and an Operational Management Plan are required to demonstrate measures to minimise the generation of dust during construction and operational phases of the proposal. Dust and odour must be managed within the site and not disperse / settle on any adjoining sites. Relevant studies need to be submitted to demonstrate air quality, odour and leachate management associated with the operation of such facilities.	Section 8.5.3 (odour assessment) Section 8.6 (dust and odour management) Appendix K AQIA

8.2 Methodology

The potential air quality impacts associated with the Proposal have been assessed in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (Approved Methods) (NSW EPA, 2016b). The Approved Methods lists the statutory methods for modelling and assessing emissions of air pollutants from major projects in NSW, which comprises:

- Determining the existing baseline air quality
- Estimating emissions from Proposal-related activities
- Using a dispersion model to predict concentrations for key pollutants at nearby sensitive receptors
- Assessing the cumulative impacts of the Proposal, considering the combined impact of Proposal-only emissions with the existing baseline air quality
- Comparing cumulative impacts with relevant criteria.

The methodology for air quality assessment, including the modelling inputs and the establishment of assessment criteria is described in the Sections below and detailed in Appendix K.

8.2.1 Emissions from the Proposal

The key emissions to air identified as potentially arising during the construction and operation of the Proposal include the following:

- Combustion gases (nitrogen dioxide (NO_2), sulphur dioxide (SO_2), carbon monoxide (CO), volatile organic compounds (VOCs)
- Particulates ($PM_{2.5}$, PM_{10} and total suspended particles (TSP)).

These emissions are anticipated to be generated from the following activities, predominately associated with the operation of the Proposal:

- Wheel generated dust from transport of incoming and outgoing waste along the sealed road to and from the MRF
- Dust due to screening, shredding, crushing and other material transfers within the MRF
- Emissions of exhaust pollutants including NO_2, SO_2, CO and particulates from vehicle movements on-site and mobile equipment within the MRF.

Due to the nature of the Proposal, there is some potential for odour to be generated during operations. The incoming waste received at the Proposal site is not anticipated to be highly odorous as it would not typically contain putrescible waste. However, it is possible that small amounts of incoming waste may be odorous, depending on the source of the waste, its cleanliness and storage prior to arrival at the MRF.

8.2.2 Assessment criteria

Combustion gases and particular matter

The Approved Methods require that air quality assessments address the potential for air quality impacts associated with a range of air pollutants and provides assessment criteria for each.

The pollutants that require assessment and the relevant assessment criteria are provided in Table 8-3.

Table 8-3 Assessed pollutants and assessment criteria

Pollutant	Averaging period	Impact assessment criteria (µg/m³)
Nitrogen dioxide (NO_2)	1-hour	246
	Annual	62
Sulphur dioxide (SO_2)	10-minutes	712
	1-hour	570
	24-hour	228
	Annual	60
Carbon monoxide (CO)	15-minute	100,000
	1-hour	30,000
	8-hours	10,000
Total suspended particles (TSP)	Annual	90
Particulate matter 10 micrometres or less in diameter (PM_{10})	24-hour	50
	Annual	25
Particulate matter 2.5 micrometres or less in diameter ($PM_{2.5}$)	24-hour	25
	Annual	8
Deposited dust	Annual	2 g/m^2/month
	Annual	4 g/m^2/month

The Approved Methods also specify impact assessment criteria for several volatile organic compounds (VOCs). VOCs are carbon-based chemicals that generally evaporate at room temperature and can affect human health if people are exposed at high concentrations. Individual VOCs associated with diesel combustion and the relevant assessment criteria are presented in Table 8-4.

Table 8-4 Impact assessment criteria for VOCs

Pollutant	Averaging period	Impact assessment criteria (µg/m³)
1,3-butadiene	1-hour	40
Acetaldehyde	1-hour	42
Benzene	1-hour	29
Formaldehyde	1-hour	20
Polycyclic Aromatic Hydrocarbons	1-hour	0.4
Toluene	1-hour	360
Xylene	1-hour	190

Emissions are anticipated to arise from a number of activities during the operations of the Proposal (refer to Section 8.5. These activities and the estimated emissions rate for each activity are identified in Table 8-5 below. The emissions inventory used for the impact assessment presented in Section 8.5 is based on the anticipated peak daily maximum throughput, which is 130 per cent of the average expected daily throughput (refer Section 4.5.10).

Table 8-5 Emissions inventory

Source of emissions	Emissions (g/s)						
	TSP	PM_{10}	$PM_{2.5}$	SO_2	NOx	CO	VOC
Incoming waste haulage	0.12	0.022	0.0054	-	-	-	-
Dumping of waste	0.0003	0.0001	0.00002	-	-	-	-
FEL transfer of waste from receival to processing	0.0003	0.0001	0.00002	-	-	-	-
Processing of cardboard and paper	0.0007	0.0003	0.00005	-	-	-	-
Processing of glass and metal	0.0004	0.0002	0.00003	-	-	-	-
Processing of plastics	0.00006	0.00003	0.000005	-	-	-	
Residuals processing	0.0001	0.00006	0.000009	-	-	-	-
Fuel combustion - mobile processing equipment	-	0.013	0.012	0.00009	0.2	0.05	0.018
Loading to trucks	0.0003	0.0001	0.00002	-	-	-	

Source of emissions	Emissions (g/s)						
	TSP	PM_{10}	$PM_{2.5}$	SO_2	NOx	CO	VOC
Product haulage	0.095	0.02	0.004	-	-	-	
Fuel combustion - waste and product trucks	-	0.002	0.002	0.00003	0.04	0.02	0.002
Total	**0.22**	**0.058**	**0.024**	**0.00012**	**0.24**	**0.07**	**0.02**

Odour

For the assessment of potential odour impacts, the Approved Methods provides impact assessment criteria that are designed to consider the range of sensitivity to odours within the community. They also provide additional protection for individuals with a heightened response to odours. The assessment criteria are based on the population within the potentially effected community. Assessment criteria are provided in Table 8-6 below. Given the location of the Proposal site, the relevant criteria for this assessment is 2.0 odour units (ou) (nose-response-time average, 99th percentile).

Table 8-6 Impact assessment criteria for complex mixtures of odorous air pollutants

Population of affected community	Impact assessment criteria for complex mixtures of odourous air pollutants (ou)
Urban (≥~2000) and/or schools and hospitals	2.0
~500	3.0
~125	4.0
~30	5.0
~10	6.0
Single rural residence (≤~2)	7.0

Due to the low likelihood of odour impacts arising from the Proposal (that is, cardboard and plastics are not odourous waste streams), a conservative assessment has been conducted and is based on the assumption that five per cent of the incoming waste from the co-mingled recyclables stream is putrescible (i.e. potentially odorous). An odour emissions factor of 113.5 ou.m^3/t.s (TOU, 2018) has been adopted based on measurements undertaken at similar facilities to the Proposal for this waste stream.

8.2.3 Baseline meteorological and air quality conditions

Meteorological mechanisms govern the generation, dispersion, transformation, and eventual removal of pollutants from the atmosphere. These are important for an assessment of potential air quality impacts as they dictate the direction pollutants may travel, the magnitude of pollutant concentrations, and where higher concentrations are likely to occur. Baseline meteorological conditions were developed for the Proposal site using the TAPM and CALMET models. These models were based on data from the Bureau of Meteorology's (BoM) Sydney Airport monitoring station for the period from 2011-2016, in accordance with the Approved Methods for Modelling (NSW EPA, 2016b) and associated CALPUFF (TRC Environmental Corporation (TRC), 2011).

Data from the air quality monitoring station at Chullora, approximately 300 m west of the Proposal site, was used to assess the ambient air quality conditions. Baseline data for the period 2015 - 2019 regarding PM_{10}, $PM_{2.5}$, NO_2 and CO has been used to establish the ambient air conditions of the Proposal site. As TSP is not monitored at the Chullora monitoring site an ambient average concentration for TSP has been estimated as twice the annual average PM_{10} concentration in 2015.

The Approved Methods specifies that due to the existing background levels of $PM_{2.5}$ and PM_{10} (see Section 8.3.2), both the maximum background concentration and the hourly ground-level concentrations of pollutants must be assessed. The methods require model predictions be generated to determine whether there would be any additional days on which the 24-hour average concentrations would exceed the relevant criteria, as well as for evaluation of the cumulative annual average $PM_{2.5}$ and PM_{10} concentrations.

8.2.4 Dispersion modelling

Dispersion modelling has been utilised to assess the potential impacts of the Proposal on the surrounding environment in conjunction with:

- Existing sources of air emissions in the regions
- Ambient background concentrations of particulate matter
- Dust deposition rates.

In accordance with the Approved Methods and associated CALPUFF guidance (TRC, 2011), dispersion modelling was conducted using the CALPUFF model. This model accounts for the 24-hour, 7 day a week operation of the Proposal and assumes a worst-case scenario of all eight roller doors are open for the duration of the operational hours. This is considered a conservative assessment given that it is likely most of these doors, particularly in the processing area where the majority of dust would be generated, would be closed for the majority of the operational hours.

8.3 Existing Environment

8.3.1 Climate and meteorology

The local metrological conditions, assessed using TAPM and CALMET models, that are likely to influence the dispersion of pollutants from the Proposal are outlined in Table 8-7.

Table 8-7 Local meteorological conditions at the Proposal site

Meteorological condition	Description
Wind speed and wind direction	On average, 63.5 per cent of winds at the Proposal site are from the northwest through to the southwest. The winds are predominantly moderate between 3-7 m/s, averaging 3.31 m/s, with a predicted maximum during the modelled period of 8.61 m/s. The dominant winds from the northwest and southwest are predicted to occur during the winter and autumn seasons, with a reduced frequency occurring during spring. Summer winds at the site are predicted to be predominantly moderate to strong (3-7 m/s) and from the northeast sector. Winds at the Proposal site are strongest during the day, particularly during the early morning period (Midnight to 6am).
Temperature	The hourly and monthly distribution of temperatures predicted for the Proposal site ranged between 4.4°C and 39.5°C. The average temperature is 17.3°C.
Atmospheric stability	Atmospheric stability refers to the atmosphere's degree of motion. When the atmosphere is considered stable pollutants are most likely to remain stationary near ground level. Under extremely unstable conditions pollutants may travel vertically and horizontally beyond the source. The conditions associated with the Proposal site were found to have neutral or high stability over 80 per cent of the time. Extremely unstable conditions were found to occur less than one per cent of the time. Linked to the degree of stability is the height above ground that pollutants are likely to disperse into; known as the 'mixing height'. The data shows that the mixing height

Meteorological condition	Description
	develops at around 6am, increases to a peak around 4pm before descending rapidly between 4-6 pm.
Local terrain and land use	The Proposal site sits at an elevation of approximately 35-40 m above sea level. The land surrounding the Proposal site shows a decrease in elevation in all directions. The Proposal site is located within an industrial area, for 150 m to the east, 500 m to the north, 500 m to the west and 800 m to the south.

8.3.2 Ambient air quality conditions

Existing sources of emissions

The 2017-2018 National Pollutant Inventory (NPI) was reviewed to identify existing air emissions sources that contribute toward the condition of the local air shed, affecting ambient background air quality. A total of 12 industrial facilities were identified with the following producing emissions similar to the Proposal:

- Pacific National, Chullora - produces significant quantities of $PM_{2.5}$
- Austral Bricks, Punchbowl – produces significant quantities of PM_{10} and SO_2
- Tooheys Brewery, Lidcombe – produces significant quantities of nitrous oxides (NO_x) and CO.

Existing ambient air quality

The ambient air quality concentrations of relevant pollutants, recorded at the Chullora monitoring station, for the period 2015-2019 are shown in Table 8-8 and Table 8-9.

As shown, the 24-hour average concentrations for $PM_{2.5}$ and PM_{10} has exceeded the relevant criteria a number of times a year during the assessed period; ranging from 1 to 22 days per year. This indicates that the ambient levels of these pollutants are variable when measured as a maximum daily concentration. The background meteorological conditions are a key contributing factor to the number of days per year that exceed the criteria (for example the spike in days in the 2019 period was likely due to the prevailing drought and bushfire conditions). Even under these extreme conditions only six per cent of the days across the year experienced ambient concentrations above the criteria level.

Measured concentrations of NO_2, CO and SO_2 measured from 2015 to 2019 are shown to be well below the impact assessment criteria.

Table 8-8 Ambient concentrations of $PM_{2.5}$ and PM_{10}

Year	$PM_{2.5}$			PM_{10}		
	24-hour average maximum	No. days > 25 µg/m³	Annual average	24-hour average maximum	No. days > 50 µg/m³	Annual average
Criteria	25 µg/m³		8 µg/m³	50 µg/m³		25 µg/m³
2015	37.2	1	8.0	64.6	1	17.5
2016	49.4	5	8.0	63.5	1	18.1
2017	44.6	8	9.5	63.0	4	20.1
2018	29.1	3	8.6	90.7	7	21.9
2019	97.6	22	11.5	140.4	20	24.6

Table 8-9 Ambient concentrations of NO_2, SO_2 and CO

Year	NO_2		SO_2			CO	
	Maximum 1-hour average	Annual average	Maximum 1-hour average	24-hour average	Annual average	Maximum 1-hour average	Maximum 8-hour average
Criteria	246 µg/m3	62 µg/m3	570 µg/m3	228 µg/m3	60 µg/m3	30,000 µg/m3	10,000 µg/m3
2015	110.7	25.7	40.0	8.7	1.5	2,750	1,750
2016	94.3	25.8	40.0	9.0	1.7	3,000	2,000
2017	123.0	25.0	40.0	8.5	1.6	2,250	1,500
2018	116.9	24.1	60.1	9.1	1.8	4,500	4,250
2019	143.5	23.5	74.4	11.4	2.0	5,750	1,750

Due to the exceedances of 24-hour averages of $PM_{2.5}$ and PM_{10} recorded between 2015-2019, the Approved Methods requires a model prediction to be added to the measured pollutant concentration for each day of the year. This model prediction has been based on the 2015 datasets, as shown in Figure 8-1 and Figure 8-2, as it was considered the best representative year due to the meteorological conditions at that time (for example the 2019 data set was likely elevated due to the drought and bushfire conditions). It is noted, however, that the previous Chullora RRC was in operation at this time and would have (albeit marginally) contributed to background air quality conditions. This assessment is therefore considered conservative as it is 'double counting' the emissions from a MRF operating at the Proposal site This modelling has been used to determine whether there would be any additional days on which 24-hour average concentrations would exceed the relevant criteria, as well as for evaluation of the cumulative annual average $PM_{2.5}$ and PM_{10} concentrations.

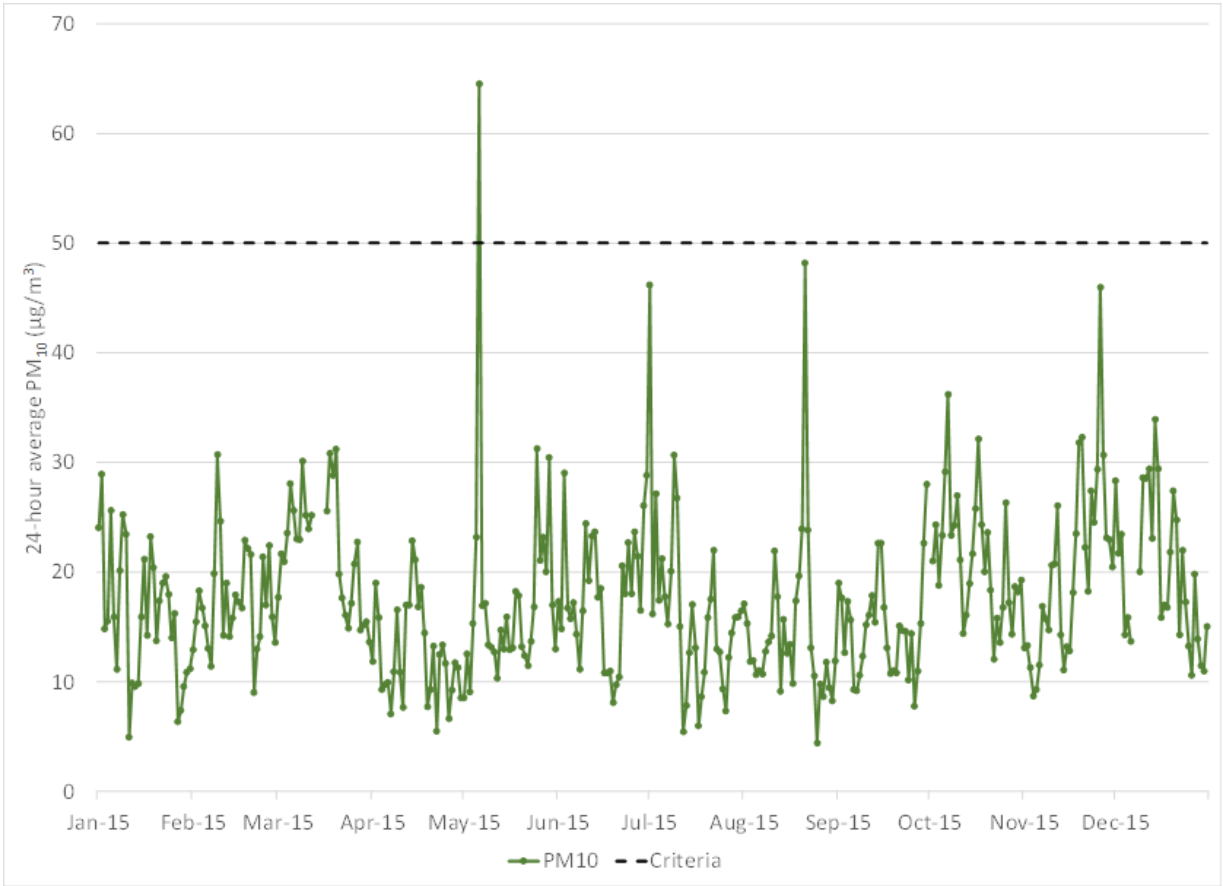


Figure 8-1 24-hour average PM_{10} concentrations for 2015

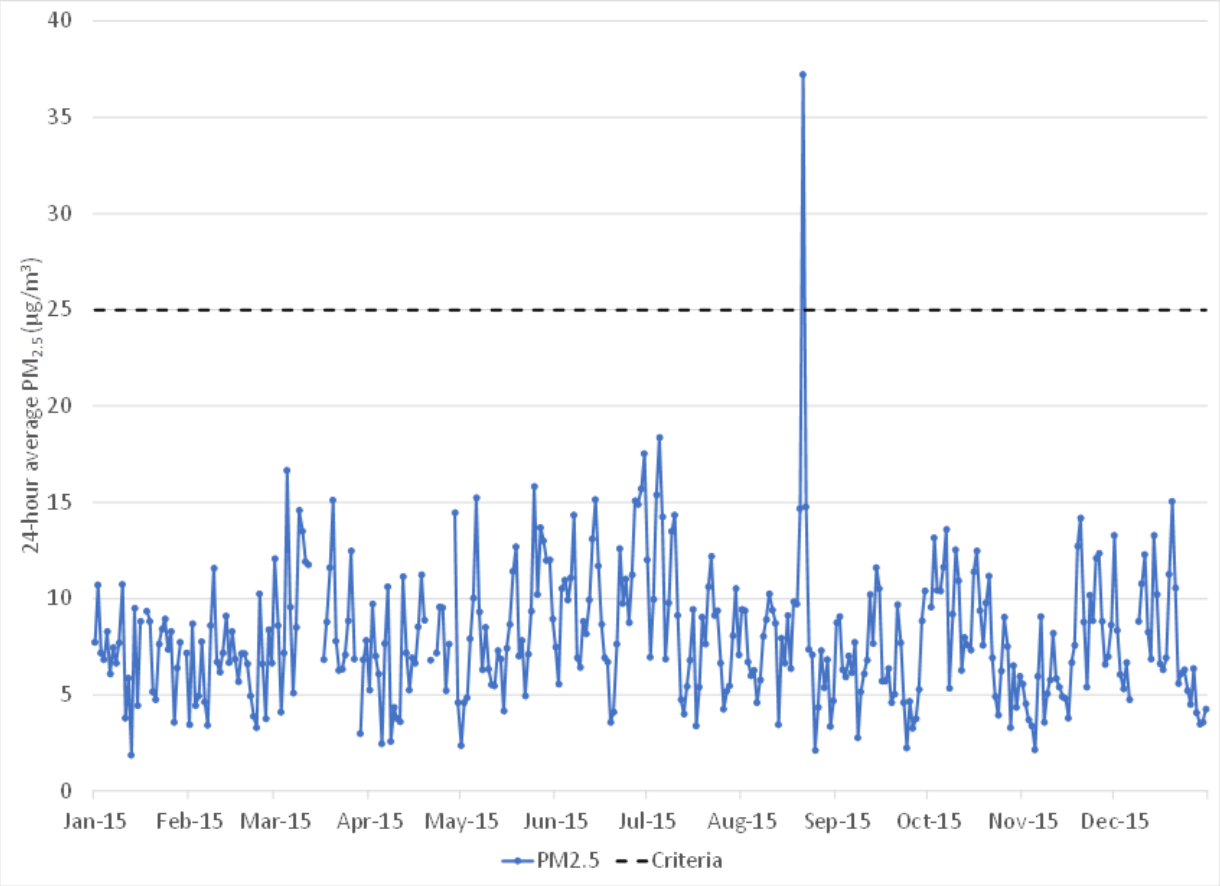


Figure 8-2 24-hour average $PM_{2.5}$ concentrations for 2015

The ambient air quality concentrations adopted for the air quality impact assessment, using the data provided above, are shown in Table 8-10. As the Chullora monitoring station did not monitor TSP, an ambient average concentration has been estimated as twice the annual average of PM_{10} concentration in 2015.

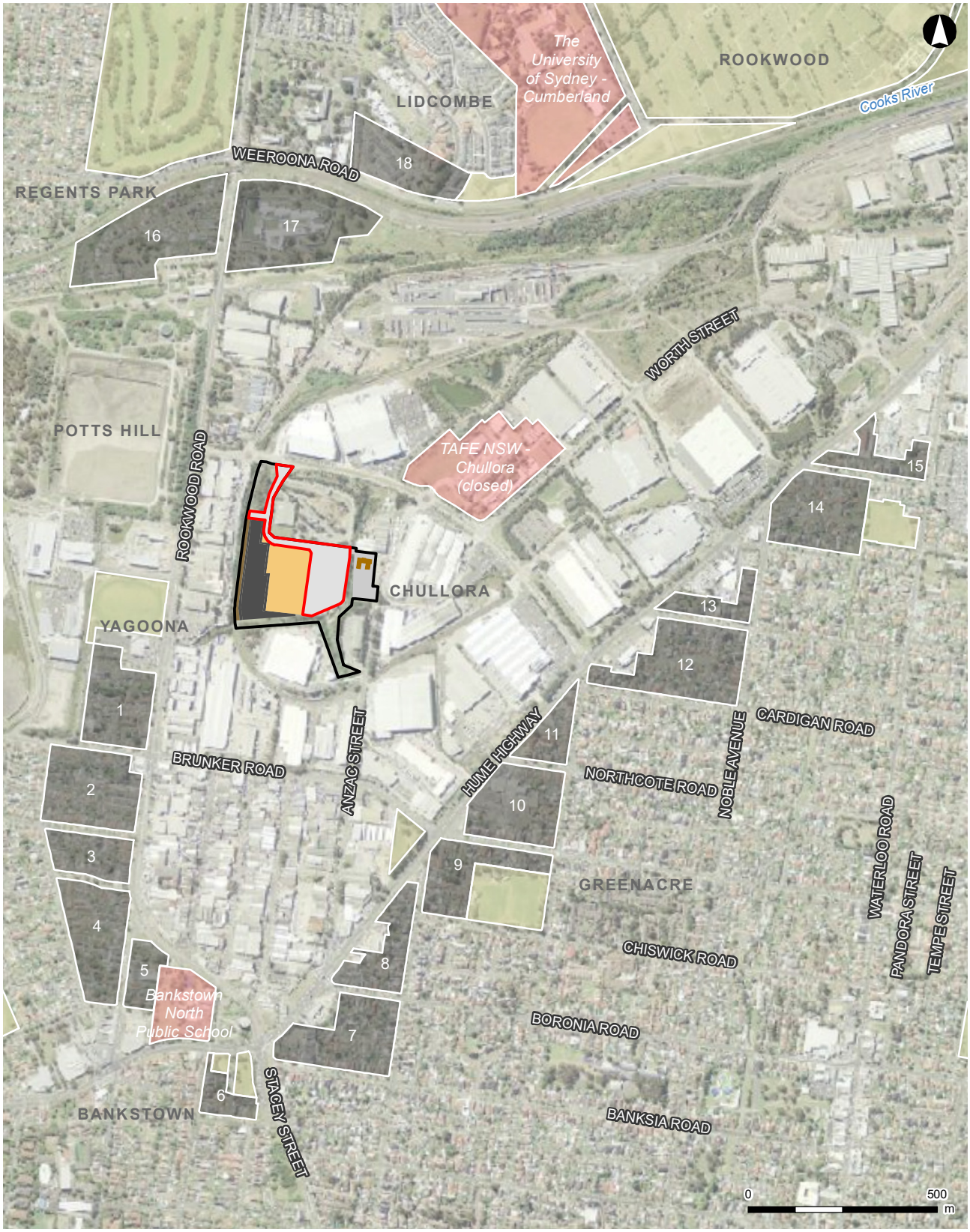
Table 8-10 Ambient concentrations used in the assessment

Pollutant	Averaging period	Statistic	Ambient background concentration (µg/m³)	Number of additional exceedances	Impact assessment criteria (µg/m³)
NO_2	1-hour	Maximum	143.5	0	246
	Annual	Average	25.8	0	62
CO	15-minute	Maximum	NA	NA	100,000
	1-hour	Maximum	5,750	0	30,000
	8-hour	Average	4,250	0	10,000
SO_2	10-minute	Maximum	NA	NA	712
	1-hour	Maximum	74.4	0	570
	24-hour	Maximum	11.4	0	228
	Annual	Average	2.0	0	60
PM_{10}	24-hour	Maximum	Contemporaneous	5	50
	Annual	Average	Contemporaneous	0	25
$PM_{2.5}$	24-hour	Maximum	Contemporaneous	1	25
	Annual	Average	Contemporaneous	0	8

8.3.3 Sensitive receptors

The Approved Methods for Modelling defines sensitive receptors as *"a location where people are likely to work or reside; this may include a dwelling, school, hospital, office or public recreational area. An air quality impact assessment should also consider the location of known or likely future sensitive receptors."*

A total of 18 sensitive zones were identified through a review of aerial imagery and are shown in Figure 8-3. These zones included parks, recreational areas, education facilities and major roads. The closest residential zone to the Proposal site (Zone 1) is located approximately 455 m to the south-west (Yagoona).



LEGEND

- Chullora RRP site boundary
- Proposal site
- Future stage
- Flood detention basin
- Established earthworks
- Existing car parking area
- Existing site office
- Education facility
- Recreational area
- Sensitive residential zone

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Coordinate System: GDA 1994 MGA Zone 56
Date issued: August 3, 2020
Aerial imagery source: NSW LPI

1:15,000 at A4

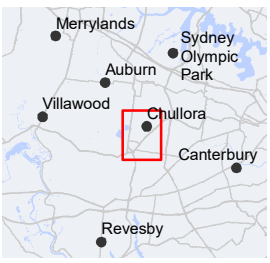


Figure 8-3: Location of the sensitive receptor zones

8.4 Construction impacts

As the construction of the Proposal would not require earthworks, emissions to air during the construction would be minor and insignificant compared with the emissions associated with the operational phase of the Proposal. The emissions generated during the construction of the Proposal would primarily be due to dust generation during the placement of the paved hardstand and from diesel exhaust emissions of vehicles bringing material to site or operating on site. As result of the short construction timeframe and limited nature of potential impacts, no specific modelling was undertaken for the construction of the Proposal.

8.5 Operation impacts

Operational impacts to air quality as a result of the Proposal have been considered with regard to $PM_{2.5}$, PM_{10}, NO_2, SO_2, CO, VOCs, dust, and odour.

The operational activities anticipated to generate the air pollutants mentioned in Section 8.2.1, include:

- Wheel generated dust from transport of incoming and outgoing waste along the sealed road to and from the MRF
- Dust due to screening, shredding, crushing and other material transfers within the MRF
- Emissions of exhaust pollutants including NO_2, SO_2, CO and particulates from vehicle movements on-site and mobile equipment within the MRF.

A number of air quality management features have been incorporated into the design of the MRF to minimise the potential for air quality impacts, including:

- Handling of incoming waste and outbound materials within a fully enclosed shed. The only exception to this would be loading of curtain-sider vehicles adjacent to the product storage area. The nature of curtain siders is that, while the truck would be outside the MRF building, loading occurs via an open side of the vehicle from within the shed therefore minimising potential air quality impacts outside the shed. Further, loading areas would be covered by awnings providing a degree of protection from adverse weather conditions.
- Major transport points within the processing area are fully enclosed as part of the fixed plant (refer Figure 8-4 below)
- All transfer points and screens are misted to minimise dust generation
- All haul roads are sealed.

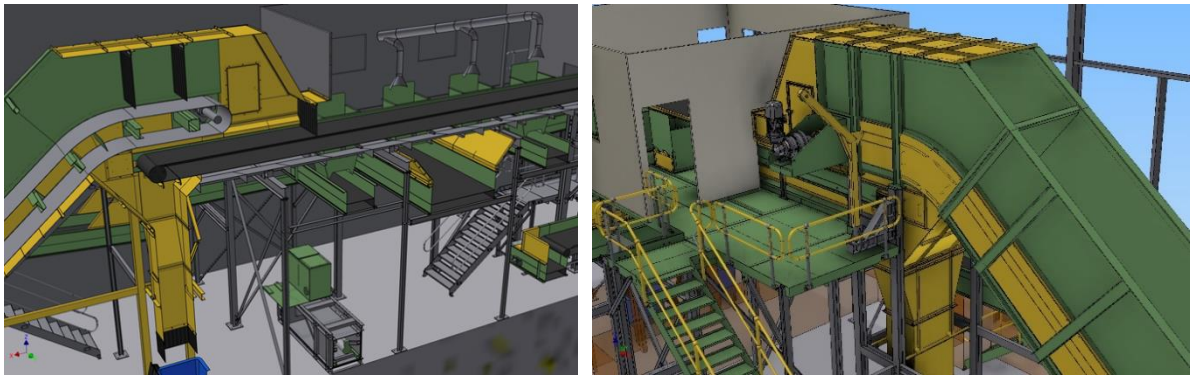


Figure 8-4 Conceptual image of enclosed transfer points within processing equipment.

Historically, MRFs would typically generate the majority of their air pollutants (namely dust) from the shredding and processing of newspaper. Within SUEZ' collections, recent years have shown an 80 per cent decline in newspaper within yellow bins contributing to significantly reducing dust generation potential. Further, a substantial proportion of the Proposal's throughput would be in the form of plastic containers; which comprise solid items (such as milk containers) with no fibre and minimal dust generation potential.

The measures included in the design have been accounted for within the pollutant generation and dispersion modelling and therefore the potential impacts presented in this chapter take into account any potential reductions associated with the measures.

The results of potential operational impacts to air quality are identified in the following sections.

8.5.1 Particulate matter

The ground level concentrations of $PM_{2.5}$ and PM_{10} were predicted using dispersion modelling for a worst case operations scenario (described in Section 8.2.4), and combined with adopted background levels to determine cumulative air quality impacts of the Proposal. The predicted incremental and cumulative ground level concentrations of $PM_{2.5}$ and PM_{10} at each sensitive receptor zone are presented in Table 8-11.

The results for the 24-hour maximum scenario indicate that concentrations of $PM_{2.5}$ and PM_{10} exceed the relevant criteria at every sensitive receptor. Notably, however, this exceedance is primarily attributed to the background concentrations of $PM_{2.5}$ and PM_{10} (refer Section 8.3.2, Figure 8-1 and Figure 8-2), with the MRF contributing a marginal proportion of total concentrations. Under the 24-hour maximum scenario the MRF would contribute only 0.5 per cent of the total $PM_{2.5}$ concentrations (noting that the contemporaneous modelling indicated that the maximum incremental MRF contribution to $PM_{2.5}$ and PM_{10} did not coincide with the maximum cumulative 24-hour scenario). Under the MRF 24-hour maximum scenario would only contribute 0.2 per cent of the total PM_{10} concentrations.

Importantly the introduction of the MRF would not result in any additional days per year where background concentrations would exceed the criteria levels. The impacts of the Proposal are therefore minor in nature and are considered to be acceptable.

Dust

The ground level concentrations of TSP and deposited dust levels were predicted using dispersion modelling and combined with the adopted background levels to determine the cumulative air quality impacts of the Proposal. The incremental and cumulative air quality impacts of the Proposal at each sensitive receptor zone are presented in Table 8-11.

As shown, the Proposal is not anticipated to exceed the relevant criteria at any sensitive receptor during operations.

Table 8-11 Predicted 24-hour average and annual average ground level concentrations of PM_{10}, $PM_{2.5}$, TSP and dust deposition at sensitive receptors

Receptor zone	$PM_{2.5}$					PM_{10}					TSP		Dust deposition
	24-hour maximum			Annual average		24-hour maximum			Annual average		Annual average		Annual average
	Incremental	Cumulative[1]	No. of additional exceedance days	Incremental	Cumulative	Incremental	Cumulative[2]	No. of additional exceedance days	Incremental	Cumulative	Incremental	Cumulative	Incremental
Criteria	**25 µg/m³**			**8 µg/m³**		**50 µg/m³**			**50 µg/m³**		**90 µg/m³**		**2 (g/m²/month)**
1	1.23	**37.23**	0	0.04	7.77	2.3	**64.56**	0	0.10	17.27	0.27	35.28	0.033
2	0.94	**37.24**	0	0.04	7.76	1.6	**64.56**	0	0.08	17.25	0.20	35.22	0.024
3	0.47	**37.23**	0	0.03	7.75	0.7	**64.56**	0	0.05	17.22	0.13	35.15	0.015
4	0.29	**37.23**	0	0.02	7.75	0.5	**64.56**	0	0.05	17.22	0.11	35.12	0.012
5	0.19	**37.27**	0	0.02	7.74	0.4	**64.56**	0	0.04	17.21	0.09	35.10	0.009
6	0.16	**37.24**	0	0.01	7.74	0.3	**64.56**	0	0.02	17.20	0.05	35.06	0.005
7	0.26	**37.22**	0	0.02	7.74	0.6	**64.56**	0	0.04	17.21	0.08	35.09	0.007
8	0.32	**37.24**	0	0.03	7.75	0.6	**64.56**	0	0.06	17.23	0.13	35.14	0.011
9	0.37	**37.30**	0	0.04	7.76	0.8	**64.56**	0	0.07	17.25	0.17	35.18	0.015
10	0.54	**37.39**	0	0.05	7.78	1.1	**64.56**	0	0.11	17.28	0.25	35.26	0.023
11	0.73	**37.33**	0	0.07	7.79	1.5	**64.57**	0	0.14	17.31	0.33	35.34	0.031
12	0.39	**37.22**	0	0.04	7.77	0.8	**64.60**	0	0.09	17.26	0.21	35.22	0.021
13	0.30	**37.21**	0	0.03	7.75	0.6	**64.65**	0	0.06	17.24	0.15	35.16	0.018
14	0.16	**37.21**	0	0.02	7.74	0.4	**64.65**	0	0.04	17.21	0.09	35.11	0.012
15	0.11	**37.21**	0	0.01	7.74	0.2	**64.63**	0	0.03	17.20	0.06	35.07	0.008
16	0.42	**37.21**	0	0.02	7.74	0.9	**64.62**	0	0.05	17.22	0.13	35.15	0.023
17	0.47	**37.21**	0	0.02	7.75	1.0	**64.56**	0	0.05	17.23	0.15	35.17	0.026
18	0.35	**37.21**	0	0.02	7.74	0.8	**64.56**	0	0.03	17.20	0.08	35.09	0.012

Note: Exceedances of the applicable criteria are shown in **bold.** All exceedances shown are not associated with the operation of the MRF as the background levels are already in exceedance of the given criteria.

[1] On this day the MRF contributes 0.2% to the total ground-level concentration

[2] On this day the MRF contributes 0.5% to the total ground-level concentration

8.5.2 Exhaust emissions

The ground level concentrations of NO_2, SO_2, CO and VOCs were predicted using dispersion modelling and combined with the adopted background levels to determine the cumulative air quality impacts of the Proposal.

The results from the NO_2, SO_2 and CO assessments show that there are no exceedances of the relevant criteria at any sensitive receptor for all incremental and cumulative scenarios. This demonstrates that the Proposal complies with the relevant air quality assessment criteria and would have a negligible impact on the surrounding airshed. The predicted ground-level concentrations of NO_2, SO_2 and CO at each sensitive receptor zone are presented in Table 8-12.

The results from the assessment of VOCs indicate that all VOCs are below the relevant assessment air quality assessment criteria at all sensitive receptors. This indicates that the Proposal is compliant with the applicable guidelines. The maximum concentration value of each VOC recorded across the 18 sensitive receptor zone is presented in Table 8-13. This table shows the maximum result recorded at one sensitive receptor (i.e. all other results are anticipated to be lower than this value).

Table 8-12 Predicted ground level concentrations of NO_2, SO_2 and CO at sensitive receptors

Receptor zone	NO_2				SO_2								CO					
	1-hour maximum		Annual average		10-minute maximum		1-hour maximum		24-hour maximum		Annual average		15-minute maximum		1-hour maximum		8-hour average	
	Incremental	Cumulative	Incremental	Cumulative	Incremental	Cumulative	Incremental	Cumulative	Incremental	Cumulative	Incremental	Cumulative	Incremental	Cumulative	Incremental	Cumulative	Incremental	Cumulative
Criteria	**246 µg/m³**		**62 µg/m³**		**712 µg/m³**		**570 µg/m³**		**228 µg/m³**		**60 µg/m³**		**100,000 µg/m³**		**30,000 µg/m³**		**10,000 µg/m³**	
1	74.7	218.2	0.26	26.1	0.06	106.5	0.04	74.4	0.006	11.4	0.0002	2.0	34.4	7,622	26.1	5,776	10.3	4,260
2	69.0	212.5	0.25	26.1	0.06	106.5	0.04	74.4	0.005	11.4	0.0001	2.0	31.8	7,619	24.1	5,774	8.5	4,258
3	40.1	183.6	0.19	26.0	0.03	106.5	0.02	74.4	0.002	11.4	0.0001	2.0	18.5	7,606	14.0	5,764	4.4	4,254
4	23.8	167.3	0.15	26.0	0.02	106.5	0.01	74.4	0.002	11.4	0.0001	2.0	11.0	7,598	8.3	5,758	2.7	4,253
5	20.3	163.8	0.14	25.9	0.02	106.5	0.01	74.4	0.001	11.4	0.0001	2.0	9.3	7,596	7.1	5,757	1.4	4,251
6	15.5	159.0	0.08	25.9	0.01	106.5	0.01	74.4	0.001	11.4	0.00005	2.0	7.1	7,594	5.4	5,755	1.1	4,251
7	22.3	165.8	0.13	25.9	0.02	106.5	0.01	74.4	0.001	11.4	0.0001	2.0	10.3	7,597	7.8	5,758	1.7	4,252
8	34.9	178.4	0.19	26.0	0.03	106.5	0.02	74.4	0.001	11.4	0.0001	2.0	16.1	7,603	12.2	5,762	2.4	4,252
9	39.6	183.1	0.25	26.1	0.03	106.5	0.02	74.4	0.002	11.4	0.0001	2.0	18.2	7,605	13.8	5,764	2.5	4,253
10	43.0	186.5	0.37	26.2	0.04	106.5	0.03	74.4	0.002	11.4	0.0002	2.0	19.8	7,607	15.0	5,765	3.9	4,254
11	49.6	193.1	0.46	26.3	0.04	106.5	0.03	74.4	0.003	11.4	0.0003	2.0	22.8	7,610	17.3	5,767	4.4	4,254
12	29.7	173.2	0.29	26.1	0.02	106.5	0.02	74.4	0.002	11.4	0.0002	2.0	13.7	7,601	10.4	5,760	2.4	4,252
13	23.0	166.5	0.20	26.0	0.02	106.5	0.01	74.4	0.001	11.4	0.0001	2.0	10.6	7,598	8.0	5,758	2.0	4,252
14	17.4	160.9	0.13	25.9	0.01	106.5	0.01	74.4	0.001	11.4	0.0001	2.0	8.0	7,595	6.1	5,756	1.2	4,251
15	10.0	153.5	0.09	25.9	0.01	106.5	0.01	74.4	0.0004	11.4	0.0001	2.0	4.6	7,592	3.5	5,753	0.8	4,251
16	26.9	170.4	0.11	25.9	0.02	106.5	0.02	74.4	0.001	11.4	0.0001	2.0	12.4	7,600	9.4	5,759	1.8	4,252
17	30.3	173.8	0.14	25.9	0.03	106.5	0.02	74.4	0.002	11.4	0.0001	2.0	13.9	7,601	10.6	5,761	2.6	4,253
18	22.4	165.9	0.09	25.9	0.02	106.5	0.01	74.4	0.001	11.4	0.0001	2.0	10.3	7,597	7.8	5,758	2.2	4,252

Note: Exceedances of the applicable criteria are shown in **bold.**

Table 8-13 Predicted VOC concentrations

Pollutant	Criteria ($\mu g/m^3$)	Predicted 1-hour maximum concentration ($\mu g/m^3$) as a receptor maximum
1,3 butadiene	**40**	0.005
Benzene	**29**	0.013
Acetaldehyde	**42**	0.046
Formaldehyde	**20**	0.120
PAH	**0.4**	0.020
Toluene	**360**	0.006
Xylene	**190**	0.005
Note: This table summarises the maximum concentration identified across the 18 sensitive receptor zones.		

8.5.3 Odour

The incoming waste received at the Proposal site is not anticipated to be highly odorous and incoming waste would not typically contain putrescible waste. However, it is possible that small amounts of incoming waste may be odorous, depending on the source of the waste, its cleanliness and storage prior to arrival at the MRF.

Using the odour emission rates as described in Section 8.2.2, the predicted ground-level odour concentrations across the receptor zones have been modelled. The results, shown in Table 8-14, show that the operation of the MRF are as follows:

- The highest contribution of odour is predicted to be 0.11 ou at one receptor, which is well below the given criteria of 2 ou
- The MRF is predicted to contribute at most five per cent of the odour criteria to odour concentrations at any sensitive receptor in the vicinity.

These results demonstrate that the ground-level odour concentrations resulting from the Proposal are predicted to comply with the odour criteria at all sensitive receptor zones.

Table 8-14 Predicted ground-level odour concentrations at sensitive receptors due to the MRF

Receptor zone	1-second average, 99th percentile odour concentration due to the MRF
Criteria	**2.0 ou**
1	0.05
2	0.05
3	0.04
4	0.03
5	0.03
6	0.02

Receptor zone	1-second average, 99th percentile odour concentration due to the MRF
7	0.03
8	0.05
9	0.07
10	0.09
11	0.11
12	0.06
13	0.04
14	0.02
15	0.02
16	0.02
17	0.02
18	0.02

8.6 Mitigation Measures

Air quality management features have been included within the proposed design to proactively manage the potential for impacts to the surrounding including:

- Enclosed shed
- Misting system
- Enclosed transfer points
- Sealed haul roads.

These measures were included within the dispersion modelling and therefore the potential impacts in this chapter consider any potential reductions associated with the measures.

Table 8-15 outlines the mitigation measures that will be implemented by SUEZ to further minimise any air quality impacts. Air quality impacts will be managed through the implementation of a site-specific CEMP and OEMP.

Table 8-15 Mitigation measures (air quality)

ID	Mitigation measures	Timing
AQ1	A CEMP, or equivalent, will be prepared for the Proposal to minimise air quality and odour impacts. Where appropriate, mitigation measures to minimise the air quality and odour impacts during construction will be reviewed and considered for incorporation into the CEMP.	Construction
AQ2	An OEMP, or equivalent, will be prepared for the Proposal that will include measures to minimise air quality and odour impacts. Where appropriate, mitigation measures to minimise the air quality and odour impacts during operation will be reviewed and considered for incorporation into the OEMP.	Operation

Conclusion

Air quality impacts associated with the construction and operation of the Proposal have been assessed in accordance with the Approved Methods (NSW EPA, 2016b).
The operational impacts of the Proposal were assessed in regard to $PM_{2.5}$, PM_{10}, NO_2, SO_2, CO, VOCs, dust, and odour. The results demonstrated that the operation of the Proposal would not result in any additional days of exceedance for $PM_{2.5}$ and PM_{10}. The ground level concentrations of NO_2, SO_2, CO and VOCs as well as odour were also found to comply with the relevant criteria.

A range of air quality managed features have been incorporated into the Proposal design and are considered in the assessment of potential impacts.

9 WATER AND HYDROLOGY

Summary

Costin Roe Consulting have prepared a Water and Hydrology Impact assessment to assess the water quality and hydrology impacts associated with the Proposal (Appendix L).

The Water and Hydrology Assessment has identified the potential impact associated with the Proposal as it relates to four key aspects:

- Water quality
- Water quantity (stormwater)
- Flooding
- Water use.

The assessment was undertaken in accordance with the relevant Commonwealth, state and local stormwater engineering and modelling guidelines. These guidelines were used to inform the targets and objectives implemented for each of the above aspects and assess whether the Proposal would meet the relevant requirements.

A number of existing pieces of water and hydrology infrastructure would exist across the Chullora RRP site (being either already in place or proposed as part of the flood mitigation works (DA 366/2020). Further features to manage water and hydrology impacts have been included within the design of the Proposal. These measures have been considered in the water quality and hydrology impact assessment.

Water and hydrology impacts arising from the construction of the Proposal are considered minimal due to the limited duration and intensity of construction activities. Any potential impacts were concluded to have been adequately mitigated by existing and proposed design and management measures.

A Model for Urban Stormwater Improvement Conceptualisation (MUSIC) has been utilised to determine the effectiveness of the existing and proposed water quality controls in relation to a number of pollutants. The modelling indicated that the stormwater treatment measures incorporated into the design of the Proposal would meet all guideline criteria and would result in only a minor increase in pollutant loads entering the receiving waters. Due to this, the potential water quality impacts of the Proposal are considered minimal.

The water quantity (stormwater) assessment found that the Proposal would not result in a significant increase the peak stormwater flows in the Cooks River canal and would not adversely impact surrounding properties. Therefore, the impacts of stormwater from the Proposal are considered minimal.

The Proposal would be constructed on an established earthworks platform 0.5 m above the 1-in-100 year flood level and therefore would have flood immunity. Notwithstanding, the Proposal site is noted to be within a probable maximum flood (PMF) extent which poses a safety risk to staff on site. Flood immune land exists in the north-western corner of the Chullora RRP which can be reached on foot, and egress is possible via Muir Road and Rookwood Road. A Flood Emergency Response Plan will be prepared for the Proposal for the highly unlikely event a PMF event occurs.

A water balance assessment was undertaken to determine the daily water supply and water use demands of the Proposal, incorporating measures to minimise water demand for the Proposal. This assessment estimated that the Proposal would have potable water demands of 1.8 kL per day. Rainwater harvesting would supply approximately 50 per cent of the non-potable water demand.

Measures to further manage water quality and hydrology impacts beyond the measures designed into the Proposal are proposed to be included in the CEMP and OEMP.

9.1 Introduction

Costin Roe Consulting (Costin Roe) have undertaken an assessment of the water and hydrology impacts associated with the Proposal to address the relevant SEARs. The Water and Hydrology

Impact Assessment is included in Appendix L of this EIS. Table 9-1 provides a summary of the relevant SEARs which relate to water and hydrology, and where they have been addressed in this EIS.

Table 9-1 SEARs (water and hydrology)

SEARs	Where Addressed
Soil and Water	
An assessment of potential impacts to soil and water resources, topography, hydrology, groundwater, drainage lines, watercourses and riparian lands on or nearby to the site, including mapping and description of existing background conditions and cumulative impacts	Section 9.3 (background conditions) Section 9.4 and Section 9.5 (assessment of impacts to water, hydrology, drainage lines, watercourses and groundwater) Chapter 10 (impacts to soils) Section 9.3.1 and Chapter 14 (riparian lands on or nearby the site) Appendix L Water and Hydrology Impact Assessment
A detailed site water balance including identification of water requirements for the life of the project, measures that would be implemented to ensure an adequate and secure water supply is available for the proposal and a detailed description of the measures to minimise the water use at the site	Section 9.5.4 Appendix L Water and Hydrology Impact Assessment
Characterisation of water quality at the point of discharge to surface and/or groundwater against the relevant water quality criteria (including details of the contaminants of concern that may leach from the waste into the wastewater and proposed mitigation measures to manage any impacts to receiving waters)	Section 9.2.1 (water quality criteria) Section 9.3.1 (characteristics of water quality) Section 9.5.1 (contaminants of concern and impacts) Appendix L Water and Hydrology Impact Assessment
Details of stormwater / wastewater / leachate management systems including the capacity of onsite detention system/s, onsite sewage management and measures to treat, reuse or dispose of water	Section 4.3.7 (features and systems) Section 9.3 (existing systems) Section 9.4 and Section 9.5 (proposed systems) Appendix L Water and Hydrology Impact Assessment
Detailed flooding assessment	Section 9.5.3 It is noted that flood management and flood planning requirements for this site have been addressed through applications and assessments lodged with Council (namely DA 366/2020). Appendix L Water and Hydrology Impact Assessment
description of erosion and sediment controls	Section 4.3.7, Section 9.3.1 and Section 9.4.1 Appendix L Water and Hydrology Impact Assessment

Further to the above, the Water and EES Groups of DPIE, the EPA, Sydney Water and Council require further details on specific requirements relating to their authority. These requirements are discussed throughout the report as indicated in Table 9-2.

Table 9-2 Other agency requirements and relevant report sections (water and hydrology)

Aspect	Where Addressed
DPIE (Water and NRAR)	
The SEARs should include: The identification of an adequate and secure water supply for the life of the project. This includes confirmation that water can be sourced from an appropriately authorised and reliable supply. This is also to include an assessment of the current market depth where water entitlement is required to be purchased.	Section 9.5.4 Appendix L Water and Hydrology Impact Assessment
A detailed and consolidated site water balance	Section 9.5.4 Appendix L Water and Hydrology Impact Assessment
Assessment of impacts on surface and ground water sources (both quality and quantity), related infrastructure, adjacent licensed water users, basic landholder rights, watercourses, riparian land, and groundwater dependent ecosystems, and measures proposed to reduce and mitigate these impacts	Section 9.4 and Section 9.5 (impacts to water resources) Section 4.3.7 (features and systems) Section 9.3 (existing systems) Section 9.4 and Section 9.5 (proposed systems) Section 9.3.1 and Chapter 14 (riparian lands on or nearby the site) Appendix L Water and Hydrology Impact Assessment
Proposed surface and groundwater monitoring activities and methodologies.	The impact assessment has concluded that the design features incorporated into the Proposal would adequately mitigate any potential surface water and groundwater impacts. Monitoring is therefore not required.
Consideration of relevant legislation, policies and guidelines, including the NSW Aquifer Interference Policy (2012), the Guidelines for Controlled Activities on Waterfront Land (2018) and the relevant Water Sharing Plans (available at https://www.industry.nsw.gov.au/water).	The Proposal would not interact with groundwater. The NSW Department of Primary Industries (DPI) (2012) NSW Aquifer Interference Policy is therefore not considered of relevance to the Proposal. The Proposal would not be considered a controlled activity under the NSW Department of Industry (2018) Guidelines for Controlled Activities on Waterfront Land. No water extraction or sharing activities are proposed as part of the Proposal. Water Sharing Plans are therefore not considered applicable to the Proposal.

Aspect	Where Addressed
DPIE (Environment, Energy and Science)	
10. The EIS must describe background conditions for any water resource likely to be affected by the development, including: a) Existing surface and groundwater	Section 9.3 Appendix L Water and Hydrology Impact Assessment
b) Hydrology, including volume, frequency and quality of discharges at proposed intake and discharge locations.	Section 9.5.2 Appendix L Water and Hydrology Impact Assessment
c) Water Quality Objectives (as endorsed by the NSW Government http://www.environment.nsw.ciov.au/ieo/index.htm) including groundwater as appropriate that represent the community's uses and values for the receiving waters.	Section 9.2.1 Appendix L Water and Hydrology Impact Assessment
d) Indicators and trigger values/criteria for the environmental values identified at (c) in accordance with the ANZECC (2000) Guidelines for Fresh and Marine Water Quality and/or local objectives, criteria or targets endorsed by the NSW Government.	Section 9.2.1 Appendix L Water and Hydrology Impact Assessment
e) Risk-based Framework for Considering Waterway Health Outcomes in Strategic Land-use Planning Decisions http://www.environment.nsw.gov.au/research-andpublications/ publications-search/risk-based-framework-for-considering-waterwayhealth-outcomes-in-strategic-land-use-planning	Section 9.2.1 identifies water quality objectives for the Proposal. A number of design features (existing and proposed) have been incorporated into the Proposal to proactively manage impacts. Section 9.5 describes the impacts from the Proposal identifying that impacts are below the adopted criteria. The above items are considered to align to the Risk-based Framework for Considering Waterway Health Outcomes in Strategic Land-use Planning Decisions (NSW EPA, 2017a).
11. The EIS must assess the impacts of the development on water quality, including: a) The nature and degree of impact on receiving waters for both surface and groundwater, demonstrating how the development protects the Water Quality Objectives where they are currently being achieved, and contributes towards achievement of the Water Quality Objectives over time where they are currently not being achieved. This should include an assessment of the mitigating effects of proposed stormwater and wastewater management during and after construction.	Section 9.2.1 (water quality objectives) Section 9.4 and Section 9.5 (impacts to water quality) Section 9.3 (existing measures to minimise impacts) Section 9.4 and Section 9.5 (proposed measures to minimise impacts) Appendix L Water and Hydrology Impact Assessment
b) Identification of proposed monitoring of water quality	The impact assessment has concluded that the design features incorporated into the Proposal would adequately mitigate any potential surface

Aspect	Where Addressed
	water and groundwater impacts. Monitoring is therefore not required.
c) Consistency with any relevant certified Coastal Management Program (or Coastal Zone Management Plan).	The Proposal site is not located within close proximity to a coastal area. Notwithstanding, the proposed water quality management measures for this development are noted to be consistent with the Botany Bay and Catchment Water Quality Improvement Plan (BBWQIP) (Sydney Metropolitan Catchment Management Authority (CMA), 2011).
12. The EIS must assess the impact of the development on hydrology, including: a) Water balance including quantity, quality and source.	Section 9.5.4 Appendix L Water and Hydrology Impact Assessment
b) Effects to downstream rivers, wetlands, estuaries, marine waters and floodplain areas.	Section 9.4 and Section 9.5 (impact on downstream receiving waters) Chapter 14 (wetlands and estuaries) Appendix L Water and Hydrology Impact Assessment
c) Effects to downstream water-dependent fauna and flora including groundwater dependent ecosystems.	Section 9.4 and Section 9.5 (water quality impacts) Chapter 14 (groundwater dependent ecosystems) Appendix L Water and Hydrology Impact Assessment Discharge is noted to be to an engineered channel (Upper Cooks River drainage channel) and discharge is consistent with discharge from the historic facility located on the site. As such there is no adverse effect on downstream rivers, wetlands, estuaries, marine waters and floodplain areas.
d) Impacts to natural processes and functions within rivers, wetlands, estuaries and floodplains that affect river system and landscape health such as nutrient flow, aquatic connectivity and access to habitat for spawning and refuge (e.g. river benches).	Section 9.4 and Section 9.5 (water quality impacts) Chapter 14 (riparian habitat) Appendix L Water and Hydrology Impact Assessment Discharge is noted to be to an engineered channel (Upper Cooks River drainage channel) and discharge is consistent with discharge from the historic facility located on the site. As such there is no adverse effect on downstream rivers, wetlands, estuaries, marine waters and floodplain areas.
e) Changes to environmental water availability, both regulated/licensed and unregulated/rules-based sources of such water.	Water use would be minimal and supplied via on-site rainwater tanks and mains water.
f) Mitigating effects of proposed stormwater and wastewater management during and after	Section 9.5.2 and Section 9.5.3

Aspect	Where Addressed
construction on hydrological attributes such as volumes, flow rates, management methods and re-use options.	Appendix L Water and Hydrology Impact Assessment
g) Identification of proposed monitoring of hydrological attributes.	No hydrological impacts have been identified for the Proposal. Monitoring is therefore not required.
13. The EIS must map the following features relevant to flooding as described in the Floodplain Development Manual 2005 (NSW Government 2005) including: a) Flood prone land.	Section 9.3.3 and Section 9.5.3 Appendix L Water and Hydrology Impact Assessment
b) Flood planning area, the area below the flood planning level	Section 9.3.3 and Section 9.5.3 Appendix L Water and Hydrology Impact Assessment
c) Hydraulic categorisation (floodways and flood storage areas)	Section 9.3.3 and Section 9.5.3 Appendix L Water and Hydrology Impact Assessment
d) Flood hazard	Section 9.3.3 and Section 9.5.3 Appendix L Water and Hydrology Impact Assessment
14. The EIS must describe flood assessment and modelling undertaken in determining the design flood levels for events, including a minimum of the 5% Annual Exceedance Probability (AEP), 1% AEP, flood levels and the probable maximum flood, or an equivalent extreme event.	Section 9.3.3 and Section 9.5.3 Appendix L Water and Hydrology Impact Assessment
15. The EIS must model the effect of the proposed development (including fill) on the flood behaviour under the following scenarios: a) Current flood behaviour for a range of design events as identified in 14 above. This includes the 0.5% and 0.2% AEP year flood events as proxies for assessing sensitivity to an increase in rainfall intensity of flood producing rainfall events due to climate change.	Section 9.3.3 and Section 9.5.3 Appendix L Water and Hydrology Impact Assessment
16. Modelling in the EIS must consider and document: a) Existing council flood studies in the area and examine consistency to the flood behaviour documented in these studies.	Section 9.3.3 and Section 9.5.3 Appendix L Water and Hydrology Impact Assessment
b) The impact on existing flood behaviour for a full range of flood events including up to the probable maximum flood, or an equivalent extreme flood.	Section 9.3.3 and Section 9.5.3 Appendix L Water and Hydrology Impact Assessment
c) Impacts of the development on flood behaviour resulting in detrimental changes in potential flood affection of other developments or land. This may include redirection of flow, flow velocities, flood levels, hazard categories and hydraulic categories	Section 9.3.3 and Section 9.5.3 Appendix L Water and Hydrology Impact Assessment

Aspect	Where Addressed
d) Relevant provisions of the NSW Floodplain Development Manual 2005.	Section 9.3.3 and Section 9.5.3 Appendix L Water and Hydrology Impact Assessment
17. The EIS must assess the impacts on the proposed development on flood behaviour, including: a) Whether there will be detrimental increases in the potential flood affectation of other properties, assets and infrastructure.	Section 9.3.3 and Section 9.5.3 Appendix L Water and Hydrology Impact Assessment
b) Consistency with Council floodplain risk management plans.	Section 9.3.3 and Section 9.5.3 Appendix L Water and Hydrology Impact Assessment
c) Consistency with any Rural Floodplain Management Plans.	No Rural Floodplain Management Plans apply to the Proposal site.
d) Compatibility with the flood hazard of the land.	Section 9.3.3 and Section 9.5.3 Appendix L Water and Hydrology Impact Assessment
e) Compatibility with the hydraulic functions of flow conveyance in floodways and storage in flood storage areas of the land.	Section 9.3.3 and Section 9.5.3 Appendix L Water and Hydrology Impact Assessment
f) Whether there will be adverse effect to beneficial inundation of the floodplain environment, on, adjacent to or downstream of the site.	Section 9.3.3 and Section 9.5.3 Appendix L Water and Hydrology Impact Assessment
g) Whether there will be direct or indirect increase in erosion, siltation, destruction of riparian vegetation or a reduction in the stability of riverbanks or watercourses.	Section 9.4.1 and Section 9.5.1 Appendix L Water and Hydrology Impact Assessment
h) Any impacts the development may have upon existing community emergency management arrangements for flooding. These matters are to be discussed with the NSWSES and Council.	Section 9.3.3 and Section 9.5.3 Appendix L Water and Hydrology Impact Assessment It is noted that flood management requirements have been approved by Council during consultation.
i) Whether the proposal incorporates specific measures to manage risk to life from flood. These matters are to be discussed with the NSW SES and Council.	Section 9.3.3 and Section 9.5.3 Appendix L Water and Hydrology Impact Assessment It is noted that flood management requirements have been approved by Council during consultation.
j) Emergency management, evacuation and access, and contingency measures for the development considering the full range or flood risk (based upon the probable maximum flood or an equivalent extreme flood event). These matters are to be discussed with and have the support of Council and the NSW SES.	Section 9.3.3 and Section 9.5.3 Appendix L Water and Hydrology Impact Assessment It is noted that flood management requirements have been approved by Council during consultation.

Aspect	Where Addressed
k) Any impacts the development may have on the social and economic costs to the community as consequence of flooding.	The Proposal would not result in any upstream or downstream flood impacts. No social or economic costs would therefore arise due to consequences of flooding from the Proposal.
EPA	
The EPA's key information requirements for the proposal include an adequate assessment of: • Water management including fire water management.	Section 9.4 and Section 9.5 (impacts to water quality) Section 9.3 (existing measures to minimise impacts) Section 9.4 and Section 9.5 (proposed measures to minimise impacts) Appendix L Water and Hydrology Impact Assessment
Sydney Water	
1. The proponent of the development should determine service demands following servicing investigations and demonstrate that satisfactory arrangements for drinking water, wastewater, and if required, recycled water services have been made.	Section 9.5.4 Appendix L Water and Hydrology Impact Assessment
2. The proponent must obtain endorsement and/or approval from Sydney Water to ensure that the proposed development does not adversely impact on any existing water, wastewater or stormwater main, or any other Sydney Water asset, including any easement or property. When determining landscaping options, the proponent should take into account that certain tree species can cause cracking or blockage of Sydney Water pipes and therefore should be avoided.	The Proposal includes the erection of a temporary pedestrian walkway overbridge that would span the Cooks River stormwater canal. The walkway would connect the mezzanine floor of the internal site office within the receival area of the MRF directly to the south-western corner of the existing car park. A lift and stairs would be installed to provide access to the walkway from the car park. The walkway would traverse the Cooks River stormwater canal, and its easement, in its entirety with no piers proposed to be installed within or adjacent to the canal. A building over and adjacent (BOA) works approval will be sought from Sydney Water during the detailed design phase of the Proposal. Further consultation will be undertaken with Sydney Water at this stage. No other works would occur within or above the Sydney Water stormwater canal and its easements.
3. Strict requirements for Sydney Water's stormwater assets (for certain types of development) may apply to this site. The proponent should ensure that satisfactory steps/measures been taken to protect existing stormwater assets, such as avoiding building over and/or adjacent to stormwater assets and building bridges over stormwater assets. The proponent should consider taking measures to minimise or eliminate potential flooding , degradation of water quality, and avoid adverse impacts on any heritage items, and create pipeline easements where required .	The Proposal includes the erection of a temporary pedestrian walkway overbridge that would span the Cooks River stormwater canal. The walkway would connect the mezzanine floor of the internal site office within the receival area of the MRF directly to the south-western corner of the existing car park. A lift and stairs would be installed to provide access to the walkway from the car park. The walkway would traverse the Cooks River stormwater canal, and its easement, in its entirety with no piers proposed to be installed within or adjacent to the canal. A BOA works approval will be sought from Sydney Water during the detailed design phase of the Proposal. Further consultation will be undertaken with Sydney Water at this stage.

Aspect	Where Addressed
	No other works would occur within or above the Sydney Water stormwater canal and its easements.
4. As this development creates trade wastewater, Sydney Water has trade wastewater requirements which need to be met. By law, the property owner must submit an application requesting permission to discharge trade wastewater to Sydney Water's sewerage system. The proponent must obtain Sydney Water approval for this permit before any business activities can commence. Given this development comprises industrial operations, wastewater may discharge into a sewerage area that is subject to wastewater reuse. Please contact Sydney Water's Business Customer Services to send your permit application or to find out more information. They can be contacted at the following email address: businesscustomers@sydneywater.com.au.	The Chullora RRP received consent (no. 21629) to discharge industrial trade wastewater from Sydney Water on 2 May 2017. A new application would be made prior to the commencement of operations to continue this existing agreement.
The proponent should outline any sustainability initiatives that will minimise/reduce the demand for drinking water, including any alternative water supply and end uses of drinking and non-drinking water that may be proposed, and demonstrate water sensitive urban design (principles are used), and any water conservation measures that are likely to be proposed. This will allow Sydney Water to determine the impact of the proposed development on our existing services and required system capacity to service the development.	Section 9.5.4 (alternative water supply and end use assessment) Chapter 23 (sustainability initiatives and WSUD principles) Appendix L Water and Hydrology Impact Assessment
Council	
Any redevelopment of the site would need to revisit the complex issue of managing or potentially relocating the flood storage areas on that part of the site.	Section 9.5.3 (flooding assessment) Appendix L Water and Hydrology Impact Assessment
It is important to ensure that the proposed significant increase in capacity can be adequately serviced by existing or potential road infrastructure, flood works and any other infrastructure required to service the increased intensity.	Section 9.5.3 (flooding assessment) Appendix L Water and Hydrology Impact Assessment
Applications must provide detailed flood investigations, with consideration of the location of the flood storage areas, Sydney Water's easements, impacts on the watercourse and Cooks River, and all other flooding impacts on the subject site and adjoining sites.	Section 9.5.3 (flooding assessment) Appendix L Water and Hydrology Impact Assessment

9.2 Methodology

The water and hydrology assessment has identified the potential impact associated with the Proposal as it relates to four key aspects:

- Water quality
- Water quantity (stormwater)
- Flooding
- Water use.

For each of the above aspects, the following steps were employed to identify the potential impact associated with the proposal:

1. Set objectives and performance targets
2. Review existing site features and water quality and hydrology infrastructure
3. Identify proposed additional controls
4. Assess the impact
5. Identify mitigation measures

Each of the above steps, as it relates to the four key water aspects is described further below.

9.2.1 Objectives and performance targets

The first step to appraising potential water related impacts from the Proposal comprised reviewing applicable guidelines, policy documents and strategic plans to identify appropriate water and hydrology objectives and performance targets for the Proposal for each aspect.

Water quality

The Proposal would have the potential to generate pollutants that may impact water quality. Primarily these pollutants may include:

- Gross Pollutants (including organic matter, leaves and rubbish)
- Total Suspended Solids (TSS) generated from sediment and dust generating activities
- Total Phosphorus (TP) generated from runoff over leaf litter, soil particles and waste, as well as from general atmospheric deposition
- Total Nitrogen (TN) generated from runoff over areas impact by automotive detergents and organic material, as well as from general atmospheric deposition
- Total hydrocarbons generated from atmospheric deposition (from fuel combustion in vehicles) or vehicle losses
- Fire water containing pollutants which are the by-products of combustion and may also contain chemical re-agents commonly used for fire suppression
- Heavy metals including lead, zins, copper, cadmium and chromium. The Proposal would be expected to produce relatively low source loadings of heavy metals which would be expected to be related to particles which are entrained to fine and some course sediments.

Objectives and performance targets have been set to minimise the potential for the above pollutants to impact receiving waterways. Objectives and targets have been derived from a review of the:

- Canterbury Bankstown City Council Development Engineering Guidelines (‘Council’s Engineering Guidelines’) (Council, 2009)
- Botany Bay & Catchment Water Quality Improvement Plan (BBWQIP) (Sydney Metropolitan Catchment Management Authority (Sydney CMA), 2011)
- Australian and New Zealand Environment and Conservation Council (ANZECC) Guidelines (ANZECC, 2000)

The objectives for the management of water quality for the Proposal has centred around the principles of Water Sensitive Urban Design (WSUD) and pollution reduction. The water quality objectives for the Proposal are to:

- Maintain or improve existing water quality within receiving waterways
- Protect the aquatic environment of the downstream waterways
- Prevent bed and bank erosion and instability of waterways
- Provide sufficient flows to support aquatic environments and ecological processes
- Incorporate a WSUD approach into the design of the Proposal

- Ensure appropriate erosion and sedimentation control measures are installed to mitigate potential impacts to the Upper Cooks River (the receiving waterway for the Proposal).

Specific water quality targets applicable to the Proposal are prescribed in both Council's Engineering Guidelines (Council, 2009) and the BBWQIP (Sydney CMA, 2011). The targets in the Water Quality Improvement Plan have been developed specifically for the Botany Bay catchment (which includes the Upper Cooks River) and are more stringent than those prescribed in Council's Engineering Guidelines. These targets are also considered more appropriate than adopting targeted specified in the ANZECC Guidelines as they have been prepared specifically for the relevant catchment; accounting for the existing water quality. The targets presented in Table 9-3 have been adopted for the Proposal. The assessment has been considered conservative as it has adopted targets above those specified by Council.

Table 9-3 Annual percentage pollutant reduction targets for the Proposal

Pollutant	Reduction target
Gross Pollutants	90%
TSS	85%
TP	60%
TN	45%
Total Hydrocarbons	90%

It is noted that although metals are not included in the targets referenced in the BBWQIP, consideration to removal of these pollutants has been included in the assessment.

Water quantity

The Proposal would have the potential to change the quantity of stormwater run-off by changing the impervious surfaces across the Proposal site. Council's Development Engineering Standards (Council, 2009) outlines Council's approach to stormwater management noting that on-site detention (OSD) may be required to ensure runoff is consistent with pre-development levels. However, if an increase in stormwater runoff would not have an adverse impact (in terms of increased local flooding and waterway stability) on the receiving stormwater system, OSD may not be required. The objectives set for water quantity management are therefore:

- To capture and manage surface water so as to maintain natural flow variability and maintain natural rates of change in water levels
- Maintain or improve the volume of stormwater flows to the Upper Cooks River
- Ensure that there would be no adverse impact on downstream drainage systems as a result of changes in stormwater runoff as a result of the Proposal.

Flooding

The Chullora RRP site is located within a 100-year flood zone. This means that during a 1-in-100 year rainfall event, described as a one percent annual exceedance probability (AEP) flood, the site may become inundated. It is noted, however, that the hydraulic hazard for the Chullora RRP site is low. This is because the site would experience a low flood depth over a wide area with low velocity flood waters. Due to the propensity for the Chullora RRP site to flood, the Proposal should consider:

- The impact of a flood on the Proposal
- The impact of the Proposal on flood regimes
- Safety in the event of a flood.

Flooding objectives have been set for the Proposal following a review of:

- NSW Floodplain Development Manual (NSW Government, 2005)
- Development Engineering Standards (Council, 2009)

The objectives set for the Proposal are to:

- Ensure the Proposal has adequate flood immunity by setting any built form 500 mm above the 1% AEP storm event
- Ensure the Proposal has no impact on either upstream, downstream or adjoining properties
- Ensure the safety of onsite personnel and visitors in the event of a flood.

Water use

The Proposal would use water during both the construction and operation phases, primarily from the following sources:

- Construction:
  - Dust suppression
  - To mix concrete
  - Washdown and cleaning
- Operation:
  - Dust suppression (e.g. misting systems)
  - Fire management (e.g. within sprinkler system)
  - Within site amenities (toilet flushing, drinking water etc)

A rainwater harvesting system has been incorporated into the design of the Proposal (refer Section 4.3.6). Through the use of this harvesting system, the water use objective set for the Proposal is to minimise demand on non-potable water.

9.2.2 Existing site features and infrastructure

Section 2.3 describes the history of the Chullora RRP site, noting that SUEZ have recently lodged a DA (DA 366/2020) with Council to complete flood mitigation and site establishment works across the Chullora RRP site. The works include water quality and hydrology infrastructure (described in Section 4.3.5) that would remain in place for the construction and operation of the Proposal; abating potential impacts. This infrastructure, as well as the environmental context of the Chullora RRP site, were reviewed as part of the water and hydrology assessment to determine the existing conditions for the Proposal.

The existing water and hydrology infrastructure that is either onsite already or will be installed as part of DA 366/2020 prior to the commencement of construction of the Proposal has been identified via a review of:

- Civil Engineering and Overland Flow / Flood Report for Early Work Development Applications (Costin Roe, 2020)
- Statement of Environmental Effects: Proposed Works for Flood Mitigation (Willow Tree Planning, 2020)
- Rookwood Road Catchment Flood Study Report (BMT WBM, 2010)
- The flood assessment and stormwater upgrade works completed to support the development (DA-1270/2016) of the PFD facility on the neighbouring lot to the north of the Chullora RRP site
- Site visits and walkovers completed by Costin Roe and Arcadis on various occasions during the preparation of this EIS and previous DAs (namely DA-1270/2016 and DA 366/2020).

The above documents were reviewed to identify the existing environmental context and infrastructure as it relates to water quantity, flooding and water use. While the existing infrastructure relating to water quality could be ascertained from the above, further background information was also required to be reviewed to identify the existing water quality for receiving waters.

The Cooks River stormwater canal that traverses the Chullora RRP site flows into the Upper Cooks River; the receiving surface water body for the Proposal. The Upper Cooks River forms part of the Botany Bay catchment. To identify the existing water quality for the Upper Cooks River a review of the following documents was undertaken:

- Development Engineering Standards ('Council's Engineering Guidelines') (Bankstown City Council (Council), 2009)
- BBWQIP (Sydney CMA, 2011)
- Cooks River Catchment 2013 / 2014 River Health Monitoring Technical Report (CT Environmental, 2015).

A number of geotechnical and soil sampling investigations have been undertaken across the Chullora RRP site over the last decade. These assessments primarily focussed on contamination investigations of the site, however, some also provided an assessment on the local groundwater conditions. These reports have been reviewed to determine the characteristics of the groundwater associated with the Proposal site, and include the following:

- Report on Soil Sampling, Former ELCAR Workshops (Douglas Partners Pty Ltd Douglas Partners), 1996a)
- Stage II Detailed Site Investigation for Lot 2 (DLA Environmental Services (DLA), 2016a)
- 15 Muir Road, Chullora, Site Redevelopment Lot 2 – Geotechnical Investigation (Pells Sullivan Meynink (PSM), 2018)
- Stage 2 Contamination Assessment – 15 Muir Road, Chullora (ERM, 2019).

9.2.3 Proposed additional controls

In addition to the infrastructure that would have been installed as part of DA 366/2020 prior to the commencement of construction of the Proposal, additional water quality and hydrology design measures have been incorporated into the design of the Proposal (refer section 4.3.7) to further manage any potential impacts from the Proposal. Additional controls have been identified and designed in accordance with:

- Managing Urban Stormwater: Treatment Techniques (NSW EPA, 1997)
- Managing Urban Stormwater: Source Control (NSW EPA, 1998)
- Managing Urban Stormwater, Soils and Construction (The Blue Book) – Volume 1 (Landcom, 2004)
- Managing Urban Stormwater, Soils and Construction (The Blue Book): Installation of services – Volume 2A (NSW Department of Environment and Climate Change (DECC), 2008)
- Managing Urban Stormwater: Harvesting and Reuse (NSW Department of Conservation and Environment, 2006).

9.2.4 Impact assessment

Modelling has been carried out to determine the potential water and hydrology impacts from the Proposal. Impacts have been assessed with the existing and proposed additional design controls in place, and have been compared to the objectives and performance targets set (Section 9.2.1) to protect the water quality and quantity values of the Proposal site and the surrounding catchment.

Water quality

A Model for Urban Stormwater Improvement Conceptualisation (MUSIC) has been utilised to determine the effectiveness of the existing and proposed water quality controls and to determine any residual water quality impacts arising from the Proposal. MUSIC was used to simulate the performance of stormwater management systems to determine the pollution reduction achieved for TSS, TP and TN. To simulate the stormwater quality the MUSIC model incorporated:

- Rainfall data (such as annual rainfall and moisture rates)
- Rainfall runoff parameters (such as soil moisture storage properties)
- Pollution concentrations that would be generated on the MRF roof structure and hardstand areas across the Proposal site
- The treatment controls incorporated into the design (existing and proposed).

Hydrocarbon removal cannot be readily modelled with MUSIC software. Consequently, source loads and treatment were analysed individually for hydrocarbons based on average concentrations (as identified by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) for industrial sites as being 10 mg/L) and the treatment options. Similarly, heavy metals are not modelled in MUSIC, however qualitative appraisal of removal efficiencies has been included.

Potential impacts, as they would relate to erosion and sedimentation have been further assessed in Section 10.4 and Section 10.5and 10.5.

Water quantity

A DRAINS model has been utilised to assess the impacts of stormwater flows from the Proposal into the receiving stormwater infrastructure. This model incorporated the following elements:

- Rainfall intensity frequency duration (IFD) data (Bureau of Meteorology (BoM), 2016)
- 2019 Australian Rainfall and Runoff (ARR) guidelines (Geoscience Australia, 2019)
- Development Engineering Standards (Council, 2009).

Flooding

A review of previous flood modelling and flood planning requirements was undertaken to determine the pre-existing conditions of the Chullora RRP site. The following datasets were reviewed:

- Rookwood Road Catchment Flood Study Report (BMT WBM, 2010)
- Previously assessed and approved modelling completed for the PFD Facility (to the north of the Proposal site) within DA 1270/2016 (dated 1 August 2017)
- Surveying results completed on the Chullora RRP site and Muir Road by Boxall Surveyors.

Prior to the flood modelling assessment, consultation was undertaken with Council to discuss the adequacy of the proposed flood mitigation works (in relation to DA 366/2020). The discussions concluded that the proposed flood storage measures in combination with the local site management met the Council's flood management requirements.

Following this, TUFLOW modelling was undertaken to determine:

- The 1% AEP flood design flow levels and validate flows with those included in the Rookwood Flood Study (BMT WBM, 2010)
- The flood impact on upstream, downstream and adjoining properties
- If additional flood mitigation measures were required
- Any safety risks associated with flooding across the Proposal site

The models assessed two scenarios:

- Pre-development – incorporating the site conditions prior to the flood mitigation works (DA 366/2020)
- Post-development – incorporating the site conditions following the completion of the flood mitigation works (DA 366/2020).

This was to ensure that the flood mitigation measures proposed as part of the flood mitigation (366/2020) met the performance criteria outlined in Section 9.2.1 and that no additional flood mitigation was needed for the Proposal.

Water use

A daily water balance assessment was undertaken to determine total water supply and demand anticipated for the operation of the Proposal. This assessment considered:

- Rainfall calculations incorporating historical rainfall data from dry, average and wet rainfall years
- The water harvesting system proposed for the MRF (refer Section 4.3.6)
- The anticipate demand anticipated for the operation of the MRF
- Water supply sources.

9.2.5 Mitigation measures

Further mitigation measures were also identified to mitigate any residual impacts identified through the impact assessment process.

9.3 Existing environment

Section 4.3.5 and Section 4.3.7 provide a description of the existing water and hydrology infrastructure across the Chullora RRP; reiterated below.

9.3.1 Water quality

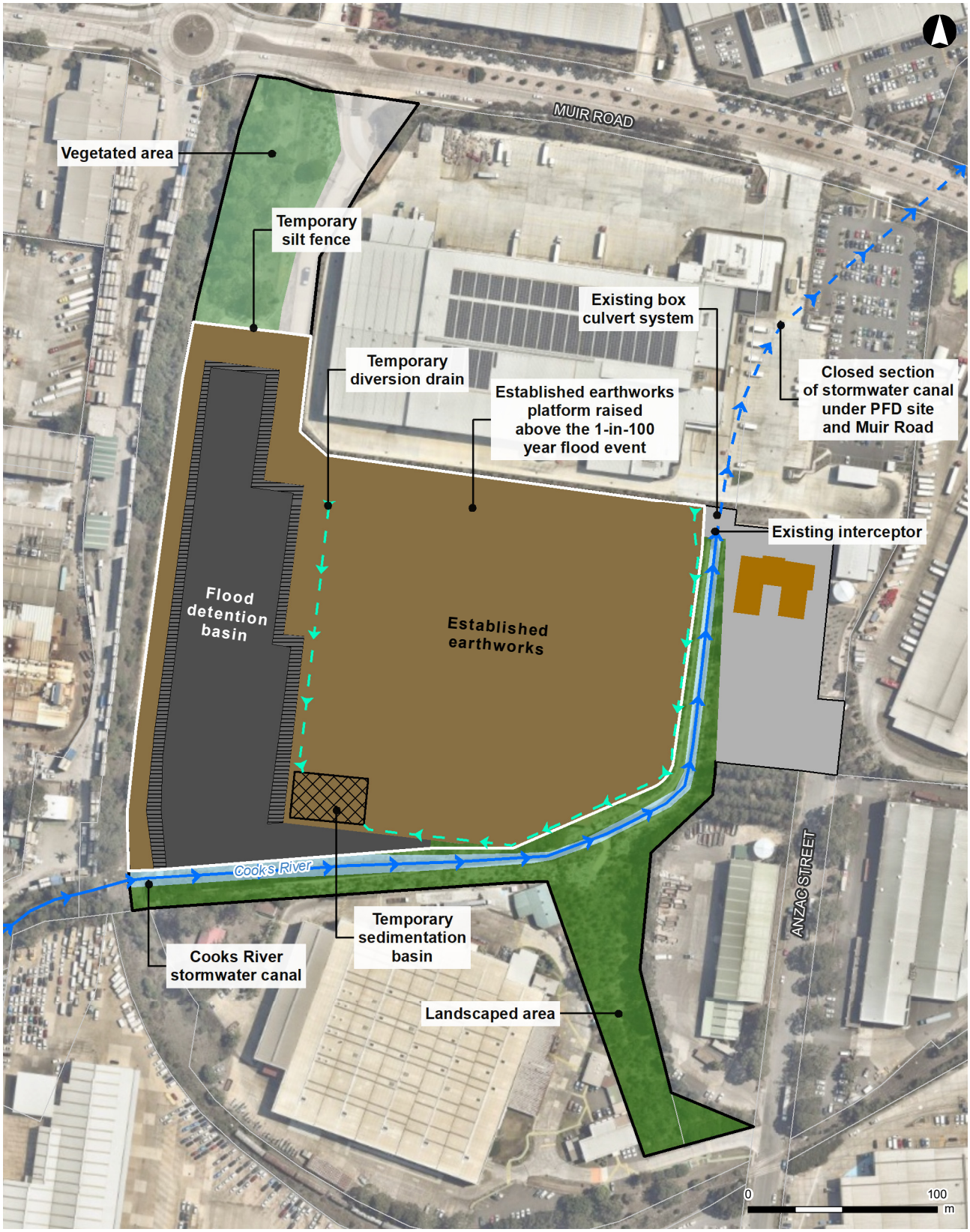
Existing water quality infrastructure

The Chullora RRP contains an existing stormwater drainage system which includes an existing interceptor located on the north-eastern portion of the Chullora RRP at the point where the site discharges from the Cooks River stormwater canal under Muir Road into the Upper Cooks River stormwater channel. Following the completion of flood mitigation works (DA 366/2020), the following additional water quality related infrastructure, including sediment and erosion controls, will have been established on the Chullora RRP site:

- Provision of sediment basins to capture sediment laden run-off from the Proposal site
- Diversion drains to direct the Proposal site runoff into sediment basins
- Highly visible silt fencing to prohibit unnecessary site disturbance and to ensure untreated runoff does not leave site
- Stabilised access points of vehicle access.

The existing water quality control features would largely control erosion and sedimentation to minimise suspended solids entering the receiving waters. Section 10.3.1 provides a description of the erodibility of the soils across the Proposal site.

Figure 9-1 shows the key water and hydrology environmental and infrastructure features associated with the Chullora RRP.



LEGEND

- Chullora RRP site boundary
- Batter
- Flood detention basin
- Property boundary
- Established earthworks
- Existing car parking area
- Existing site office
- Stormwater drainage

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Aerial imagery source: nearmap Jan 2020

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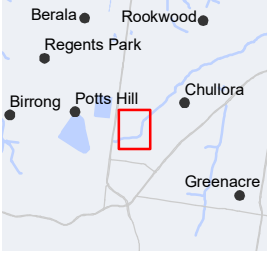


Figure 9-1: Existing water and hydrology infrastructure

Surface water quality

The Proposal is located within the Cooks River catchment, comprising an area of approximately 100 km^2 within the Sydney Basin. The Cooks River stormwater canal, located to the immediate south and east of the Proposal site, flows into the Upper Cooks River - the receiving water for the Proposal. The Cooks River stormwater canal comprises a concrete lined and block walled channel which flows northwest into the Upper Cooks River catchment.

Water quality in the Cooks River is noted to be severely degraded due to historical industrial pollution and modification of its natural flow paths (i.e. development of artificial canals). The Cooks River Catchment 2013 / 2014 River Health Monitoring Technical Report (CT Environmental, 2015) assessed the Upper Cooks River as D+, indicating a degraded waterway. The major water quality issues identified in the report include:

- Riparian vegetation of low complexity and limited habitat value
- Low macroinvertebrate richness and biodiversity
- Frequent flooding and high water velocity flows during high rainfall events
- Elevated nitrogen and phosphorus levels
- Low dissolved oxygen levels.

Sediment sampling undertaken in the Cooks River stormwater canal, adjacent to the Proposal site, during contamination investigations of the Chullora RRC site in 2016 (DLA, 2016b) indicated elevated levels of copper, nickel, lead and zinc (see Section 10.3). DLA (2016b) concluded that up-stream industrial processes and road surface run-off where likely contributing to the degraded water quality within the Cooks River stormwater canal.

Groundwater

DLA (2016a) conducted a review of groundwater bores which indicated that four bores were present within a one km radius of the Proposal site. These bores were located to the northwest of the Proposal site and were installed at depths of 2.5 m – 6 m below ground level (bgl). Groundwater sampling undertaken by DLA (2016a) included sampling within monitoring wells across the Chullora RRP site. Groundwater was found at shallow depths across the Chullora RRP site (0.74 m below top of well). Groundwater is typically present at shallow depths closer to the Cooks River on the south and east of the Proposal site and at greater depths away from the river. Douglas Partners (1996a) concluded that groundwater flow was likely to be to the northeast, towards Cooks River.

Groundwater sampling identified elevated levels of some heavy metals (nickel (Ni) and zinc (Zn)) as well as dichlorodiphenyltrichloroethane (DDT). Groundwater contamination is discussed further in Section 10.3.2.

DLA (2016a) also reviewed the *Salinity Potential in Western Sydney* map, which indicated the site was in an area of moderate salinity potential with high salinity potential also listed within the area (see Section 10.3.1).

Given the industrial and urban nature of the surrounding area, the expected salinity and the wide availability of reticulated water in the area, groundwater was not expected to be abstracted for domestic, stock or irrigation uses.

9.3.2 Water quantity

Stormwater on the Chullora RRP site is currently diverted through a trunk drainage system. This system consists of a concrete drainage channel, unformed irregular open channel and closed box culvert system. The drainage channel forms the upper reaches of the Cooks River and extends through the Chullora RRP site from the south-west to north-east at an average grade of 2.5 per cent. The land to the north and west of the system is relatively flat and drains to low points in the area and into the concrete channel. The discharge to the Upper Cooks River is located at the north-east of the Chullora RRP site. The discharge point comprises a 1,050 mm diameter reinforced concrete pipe and

825 mm diameter reinforced concrete pipe, which discharge directly into a concrete lined portion of the Upper Cooks River drainage channel

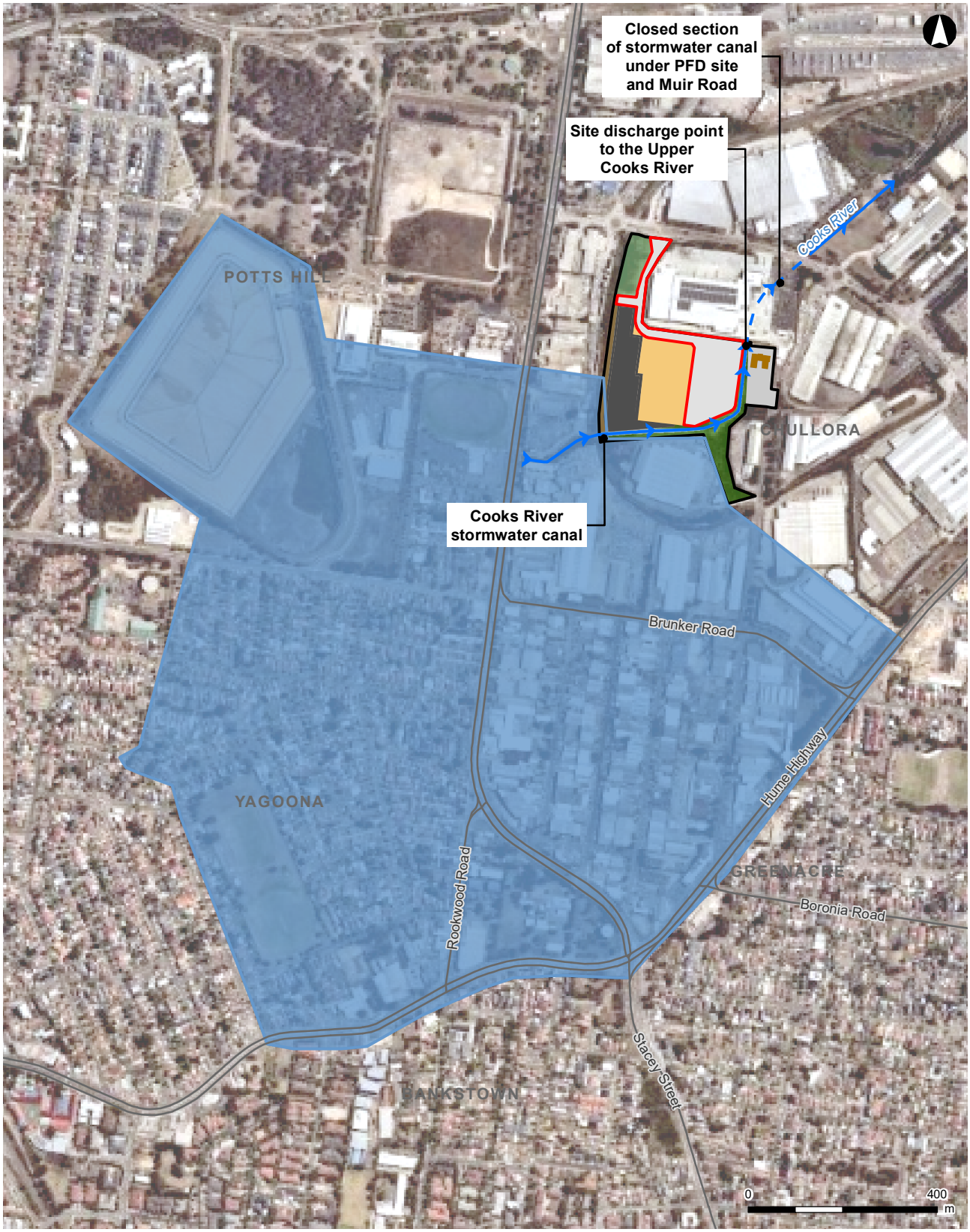
In the upstream portion of the drainage channel, from the railway crossing at the western end of Chullora RRP site to the concrete channel at the south-east of site, is a regular vegetation cross section. Downstream of the channel, toward Muir Road, is a channel approximately 6.1 m wide and 1.2 m deep. This channel has a concrete base and brick walls, with steep vegetated slopes in the overbank areas. Existing crossings of the channel in the form of brick culverts and slab on grade vehicle crossing, are noted to severely restrict flow during flood events.

As noted in Section 2.3, the Chullora RRP site was previously operated as the Chullora RRC for two decades. During this time, the site was covered with an impervious hardstand and buildings, with integrated flood storage and stormwater infrastructure. After the 2017 fire the majority of the site infrastructure was removed however much of the impervious hardstand was retained.

Following the completion of flood mitigation works (subject to DA 366/2020) (refer Section 2.3) the Chullora RRP site will consist largely of stabilised partially pervious earthworks in preparation for the construction of the Proposal. The nature of the site in this state would be temporary as construction of the Proposal is anticipated to commence immediately following the completion of the flood mitigation works. Generally, the Proposal site is considered to have a pre-development status comprising completely of impervious surfaces.

9.3.3 Flooding

As noted above, the Proposal site is located adjacent to a stormwater canal and culvert system which forms the upper reaches of the Cooks River. The upstream contributing catchment is approximately 174 ha and located to the south and southwest of the site, as shown Figure 9-2. The Proposal site is noted to be potentially affected by a probable maximum flood (PMF) extent.



LEGEND

- Chullora RRP site boundary
- Proposal site
- Future stage
- Flood detention basin
- Established earthworks
- Existing car parking area
- Existing site office
- Cooks River stormwater canal
- Landscaping area
- Vegetated area
- Upper Cooks River catchment
- Stormwater drainage

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Figure 9-2: Upper Cooks River catchment

Flood storage and mitigation works would be undertaken prior to the commencement of construction of the Proposal as part of the flood mitigation works (DA 366/2020). These works include raising the eastern portion of the Chullora RRP site to a level 0.5 m above the one per cent AEP flood level (approximately RL (reduced level) 37.5 metres (m) Australian Height Datum (AHD)), providing flood immunity to the Proposal site. In addition, a 22,100 m^3 open flood detention basin will be developed in the western portion of the Chullora RRP site providing flood storage up to, and including, in a one per cent AEP flood event.

The PMF extents are shown in Figure 9-3, noting however that these extents were modelled prior to the completion of the flood mitigation works which would substantially alter the PMF flood depth across the site (potentially raising the Proposal site out of the PMF completely).

TUFLOW flood modelling undertaken for the flood mitigation works (DA-266/2020) (Costin Roe, 2020) indicated that the flood mitigation works would improve the overall flood conditions for the Chullora RRP and the surrounding properties. Peak flood levels prior to the completion of the flood mitigation works were large enough to cause inundation in the southern portion of the Chullora RRP during the one per cent AEP event, overtopping the culverts to the east of the site and overland flows onto Muir Road.

Following completion of the flood mitigation works the modelling demonstrated that there would be an overall reduction in peak flood levels through the southern portion of the Chullora RRP site and an elimination of overland flows onto Muir Road, ensuring that these works would not result an increase in flood impacts to properties upstream or downstream of the site (rather, providing an improved flooding outcome). The existing flooding conditions for the Chullora RRP site, upon commencement of the construction of the Proposal, can therefore be summarised as follows:

- The Proposal site would comprise an established earthworks platform raised 0.5 m above the one per cent AEP flood level with flood immunity up to, and including, this event
- The flood detention basin located in the western portion of the Chullora RRP site would provide sufficient flood storage to prevent any overtopping of the existing culvert and drainage system, overland flow onto Muir Road, or any upstream or downstream property impacts.

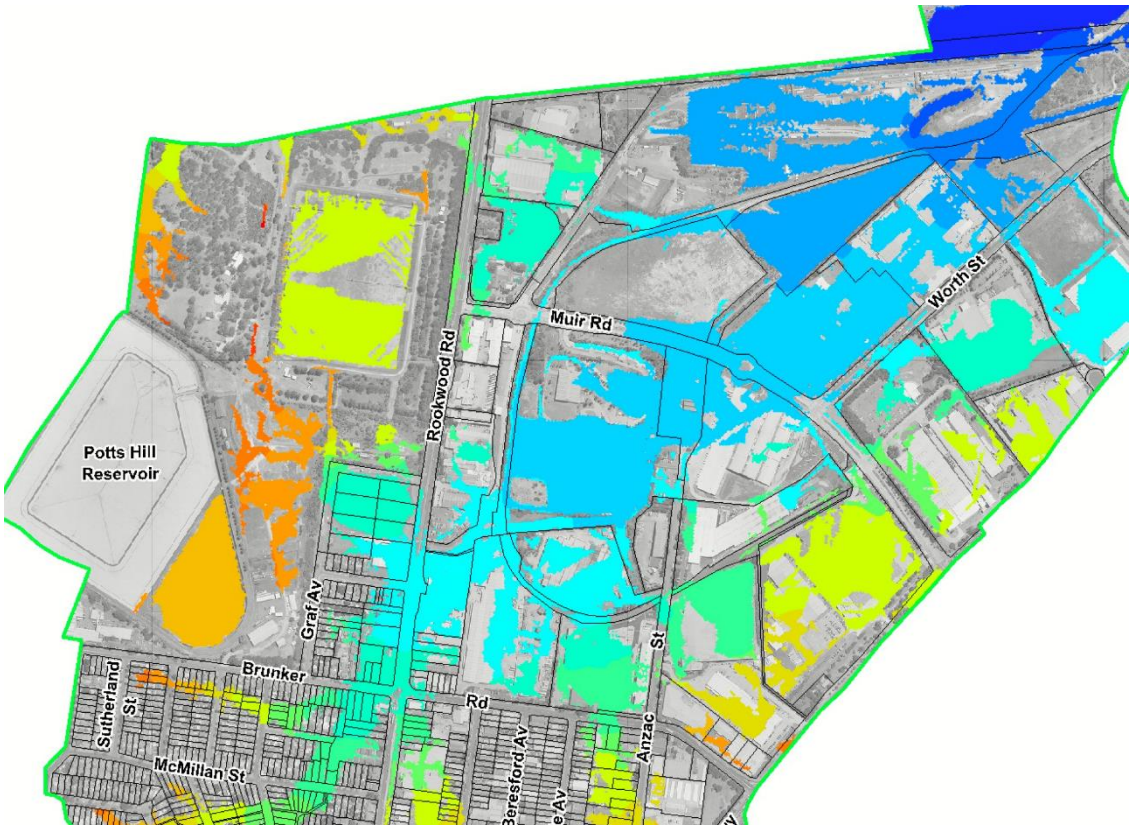


Figure 9-3 PMF Flood Extent and Level (BMT WMB, 2010)

9.3.4 Water Use

The previous Chullora RRC would have had a similar, if not greater, water demand than the Proposal due to the similar operational activities (i.e. MRF operations) and employee amenities requirements. Fire systems were also in use on this facility and would have contributed significantly to the water demand.

Following demolition of the previous Chullora RRC there would have been a minimal water use demand across the Chullora RRP site. Following the completion of the flood mitigation works, there would be no water use demands on the Proposal site.

9.4 Construction impacts

9.4.1 Water quality

Disturbances to soils during construction could result in surface water runoff (e.g. sediment laden “dirty” water) into the downstream receiving waters of the Upper Cooks River. This has the potential to transport pollutants such as sediment, chemicals, oils and grease into the downstream receiving waters which could result in water quality and biodiversity impacts.

In addition to the existing controls already in place across the Chullora RRP (described in 9.3.1) A draft erosion and sediment control plan (ESCP) have been prepared and included in Appendix L. The ESCP and the proposed controls would be established prior to the commencement of construction of the Proposal and would outline measures to protect the downstream drainage system and receiving waters from sediment laden runoff. The erosion and sediment controls outlined in the plan include the following:

- Provision of sediment basins to capture sediment laden run-off from the Proposal site
- Diversion drains to direct the Proposal site runoff into sediment basins
- Highly visible silt fencing to prohibit unnecessary site disturbance and to ensure untreated runoff does not leave site
- Vehicle access would be limited through only stabilised access points
- Water will be used to control dust during windy weather.

Section 10.3.1 describes the risk of soil erodibility across the Chullora RRP site, noting that the soil properties would make the erosion risk high. The soils across the Proposal site, however, would largely comprise crushed aggregate materials and imported fill which would be stabilised as part of the flood mitigation works. This stabilisation, the establishment of erosion and sediment control features and the implementation of the ESCP would minimise the risk of sediment entering and impacting the receiving waters. Further, the Proposal site would only have exposed earthworks for a short period of time, with construction of the hardstand area across the Proposal site proposed to commenced immediately upon completion of the flood mitigation works (subject to the approval and timing of DA 366/2020).

During construction, fuels and chemicals required for construction would be stored on the Proposal site and within construction compounds. Due to this, there is potential for fuels and chemicals to spread to the surrounding environment, including the Cooks River, through spills and leaks. A PIRMP will be prepared for the construction and operation of the Proposal outlining measures to response to incidents, including spills and leaks.

As the Proposal would not require substantial excavation works (beyond minor trenching for the laying of utilities wholly within the fill layer across the Proposal site) and is raised above 38 m AHD, the construction of the Proposal would not intercept groundwater. The controls provided to manage surface water, including erosion and sediment controls and the PIRMP, would minimise the risks of the Proposal impacting groundwater quality.

9.4.2 Water quantity

As the construction of the Proposal involves the development of a permanent hardstand surface, the extent of impervious surfaces would change during the course of the development works. Due to this, the nature of the stormwater flows into the existing stormwater infrastructure would change over time.

However, due to the temporary nature of construction, any impacts would be considered minimal and would be less than during operation (as the operational scenario has been assessed assuming the Proposal site and future stage area in the centre of the Chullora RRP would be fully impervious). Operational stormwater impacts are assessed in Section 9.5.2 and were found to cause a negligible impact on the stormwater drainage network. As such, it is predicted that the existing stormwater culverts would handle any changed stormwater regime.

9.4.3 Flooding

The Proposal would be constructed on a foundation which would be above the one percent AEP flood event level. Given that construction works would be clear of the one percent AEP flood event level construction works would have appropriate flood immunity.

Notwithstanding, it is noted that the Proposal site is within the PMF extent which poses a risk to the safety of construction employees should this event occur. It is possible that the Proposal site would have immunity to the PMF given a 0.5 m freeboard above the one percent AEP has been established to ensure adequate flood immunity for the Proposal site. The egress from the Proposal site would be to areas to the north of the Chullora RRP (via Muir Road and Rockwood Road) which are not affected by PMF flooding. The north-western corner of the Chullora RPP is raised above the PMF level (refer Figure 9-3 and can be easily reached on foot within minutes from the Proposal site.

9.4.4 Water use

The construction of the Proposal would have a limited water demand. Water may be used during the placement of hardstand for dust suppression and to mix concrete for use on site and would be supplied through the existing Sydney Water mains network. Given the short duration and intensity of construction activities (i.e. no earthworks), the total water use during construction is considered minor and could be adequately sources from the surrounding mains network.

9.5 Operation impact

9.5.1 Water quality

Stormwater pollutants

The Proposal has the potential to impact stormwater quality entering the Cooks River stormwater canal due to the presence of pollutants in surface water. As rain falls on the Proposal site, stormwater would have the potential to collect pollutants such as litter, sediments and nutrients. Hydrocarbons (chemicals and oils and greases) could also be collected from the stormwater due to leaking engine sumps and accidental fuel leaks and spills. These pollutants have the potential to degrade the water quality of the surrounding drainage network and adversely impact biodiversity that uses these systems.

In addition to the existing water quality infrastructure (described in Section 9.3.1) a series of stormwater treatment measures have been incorporated in the design of the Proposal to prevent water quality impacts from the Proposal (refer Section 4.3.7). These measures have been developed in accordance with the guidance document *Managing Urban Stormwater: Treatment Techniques* (NSW EPA, 1997) to ensure that all of the objectives above are met.

The proposed treatment system would consist of the following features (refer Figure 9-5):

- Vortech style gross pollutant traps (GPT) (e.g. Rocla CDS or similar)

- Surface drainage systems to divert and distribute stormwater through the treatment system
- Bio-retention filtration systems (e.g. jellyfish device).

Indicative conceptual visualisations of the proposed stormwater treatment systems are shown in Figure 9-4. The existing interceptor described in Section 9.3.1 would also be utilised during the operation of the Proposal.

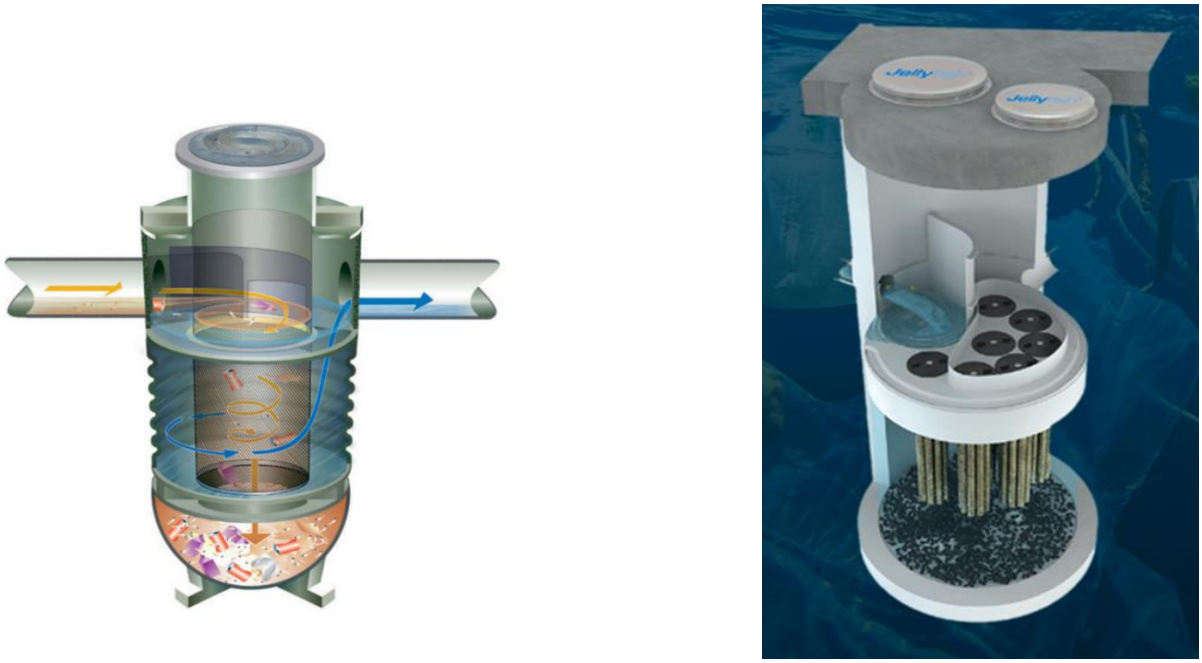
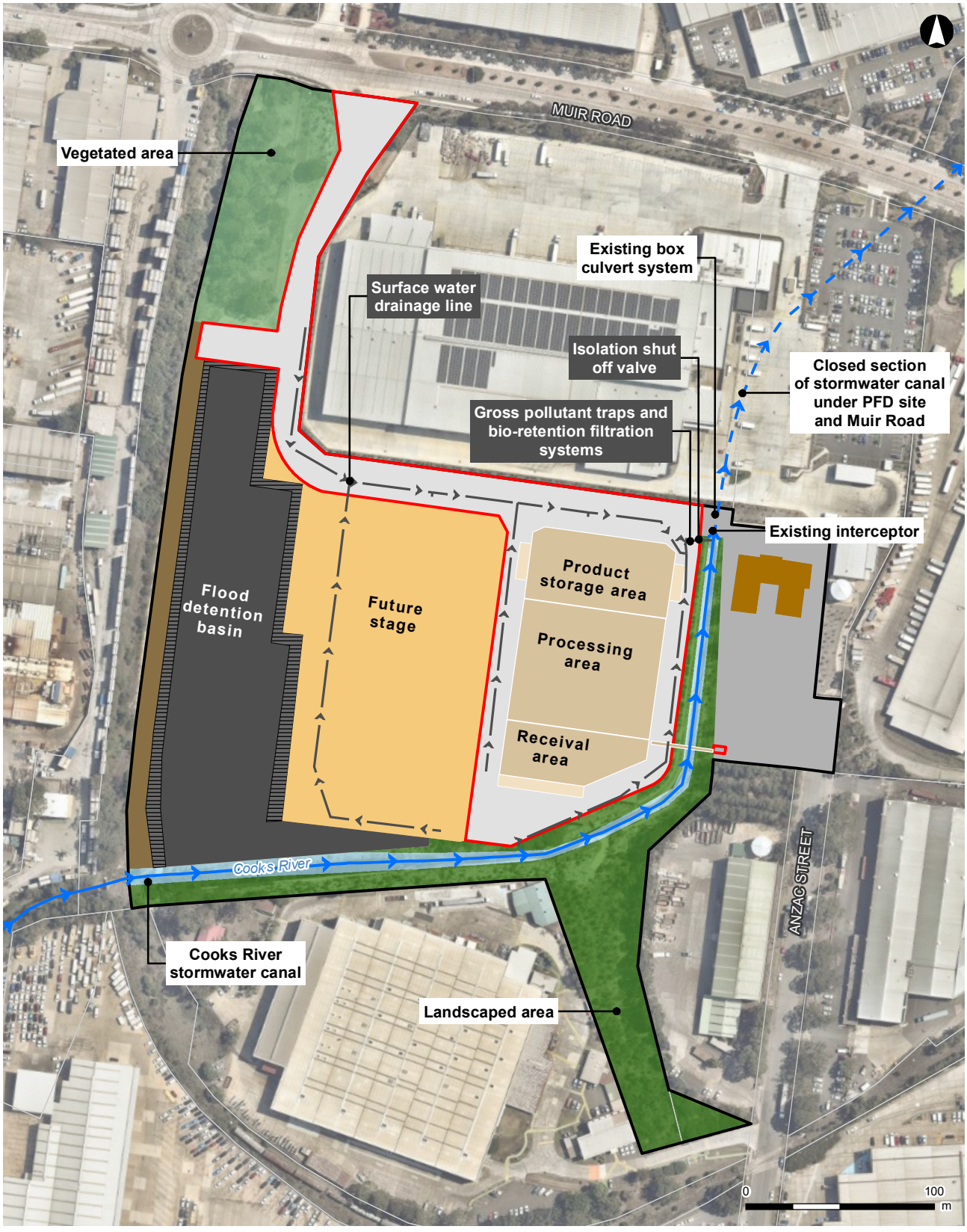


Figure 9-4 Proposed stormwater management features (left: vortech style GPT; right: jellyfish filtration system)



LEGEND

- Chullora RRP site boundary
- Proposal site
- Future stage
- Established earthworks
- Stormwater drainage
- Batter
- Flood detention basin
- Property boundary
- Existing car parking area
- Existing site office

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Figure 9-5: Proposed water and hydrology infrastructure

The stormwater treatment measures included in the design have been accounted for within the stormwater modelling scenarios and therefore the potential impacts presented in this Chapter consider any potential reductions associated with the measures. An exception to this is the existing interceptor located in the north-western corner of the Chullora RRP, which has not been included in the MUSIC model for the Proposal. Water quality modelling is therefore considered conservative, and a higher pollutant reduction level would likely be achieved.

MUSIC modelling was used to assess the effectiveness of the proposed stormwater treatment measures described above. The modelling indicates that through the use of these treatment measures, pollutant load reductions for TSS, TP, TN, total hydrocarbons and gross pollutants will meet the targets identified in Section 9.2.1. Table 9-4 shows the estimated pollutant loads that would be generated on the Proposal site during operation and the anticipated reductions in these loads through the implementation of the stormwater treatment system.

The MRF would be expected to produce relatively low levels of hydrocarbons (limited to leaking engine sumps or accidental fuel spills / leaks). Hydrocarbon removal cannot be readily modelled with MUSIC software. A qualitative review of the proposed stormwater treatment system found that the systems would achieve high level of effectiveness in removal of hydrocarbons (filtration systems have been found to remove 97 per cent of hydrocarbons and GPT treatment is reported to provide between 82-94 per cent reductions). When combining a GPT with a filtration system, a reduction of greater than the targeted 90 per cent reduction of hydrocarbons would therefore be achieved (noting this can be readily achieved by the GPT alone).

Similarly, only minor source loadings of heavy metals are anticipated to be associated with the Proposal. A qualitative review of the proposed stormwater treatment system found that removal of heavy metals in Jellyfish devise has been shown to be highly effective. Further, the vortech type GPT would provide between 80-90% reduction in heavy metals based on treatment of fine sediments. When combining the vortech GPT with a Jellyfish filtration system, a reduction of around 90% of heavy metals could be expected.

Table 9-4 Water quality assessment results

Pollutant	Source	Residual Load (kg/y)	Reduction (%)	Target (%)	Target Met (Y/N)
Estimated Stormwater Flow: 3.07 ML/yr					
TSS	1900 **kg/y**	67	96.5	85	**Y**
TP	3.55 **kg/y**	1.14	67.9	60	**Y**
TN	17.3 **kg/y**	9.08	47.5	45	**Y**
Total hydrocarbons	Assessed qualitatively		≥ 90	90	**Y**
Gross pollutants	82.2 **kg/y**	0	100	90	**Y**
Heavy metals	Assessed qualitatively		≥ 90	None	**N/A**

The MUSIC modelling demonstrates that the Proposal would meet all guideline criteria and would result in only a minor increase in pollutant loads entering the receiving waters. Due to this, the potential water quality impacts of the Proposal are considered minimal.

Leachate and wastewater

Leachate and wastewater quantities that would be generated by the Proposal are expected to be negligible. All waste would be deposited, processed and stored within the fully covered and enclosed MRF building and all product collection and waste drop-off trucks would be covered; eradicating the potential for rainwater to come in contact with waste. The MRF building would be a ‘dry’ facility with no internal taps and cleaning and washdown would be carried out via high pressure air with no water

used. An overhead misting system would be utilised for dust suppression; however, these systems are designed to provide an atomised spray. This means that no moisture would reach the floor of the MRF. Consequently, daily operations would not generate any leachate.

On rare occasions water may be used to clean up spills or leaks. If this water comes into contact with waste minor quantities of leachate may be generated, otherwise this water would be considered wastewater. These quantities would be minor (via hand wash down with buckets) and would not occur on a regular basis. The main source of wastewater would therefore be via toilet flushing which has been quantified in Section 9.5.4. In the rare event that leachate or wastewater is generated within the MRF it would be drained to a sump located in the processing area of the MRF. This potentially sediment laden or oily wastewater would be discharged to sewer through a trade waste agreement which would be sought from Sydney Water prior to the commencement of operations. It should be noted that the Chullora RRP has an active trade waste agreement in place (consent no. 21629).

Fire water

Two inground pits / interceptors would be provided in the receival area to capture any water generated by the sprinkler and deluge system in the event of a fire emergency. In order to assist with the containment fire water runoff, provision of an automated shut off valve would be provided upstream of the proposed discharge point into the Upper Cook River drainage channel. The shut off valve would comprise a keystone or knife-gate valve with an electric actuator which would be triggered by the fire alarm. Water captured within these pits would be pumped and disposed of offsite at an appropriately licensed facility. The two pits would have a total capacity of 1.536 million litres; sized to capture the maximum capacity of the sprinkler and hydrants tanks.

Groundwater

Once operational the Proposal would be operated on a raised fully hardstand area and would not interact with groundwater. Due to the impervious nature of the proposed hardstand the potential for the operation of the Proposal to impact groundwater quality would be minimal and would be limited to any spills or leaks moving beyond the Proposals site boundary that occur within vehicles or machinery outside the MRF. A PIRMP will be prepared for the operation of the Proposal and spill kits will be located within the MRF to ensure appropriate management of skills and leaks in the event of an incident.

9.5.2 Water quantity

Once operational the Proposal site would comprise completely impervious surfaces. The primary impervious surfaces on the Proposal site include a large pitched warehouse roof and paved hardstand area. Two 25 kL rainwater harvesting tanks would be installed on site to capture rainwater from the warehouse roof and would have the potential to reduce stormwater volumes leaving the site. As described in Section 9.3.2 the extent of impervious surfaces would be commensurate with, or less than, the historic extents of impervious surfaces across the Chullora RRP site.

The existing reinforced concrete stormwater discharge pipes in the north-east of the Proposal site would be maintained as part of the Proposal. Stormwater from these pipes flow into an open concrete channel (the Cooks River canal) in the lower end of the Upper Cooks River Catchment.

During storm events it is anticipated that the combined peak stormwater flows (from the local catchment and larger Upper Cooks River catchment) in the Cooks River canal would not increase as a result of the Proposal. Due to this, the impacts of stormwater from the Proposal are considered minimal and would not adversely impact the flooding regimes upstream or downstream of the Proposal site.

Council's Development Engineering Standards (Council, 2009) outlines Council's approach to stormwater quantity management noting that OSD may be required to ensure runoff is consistent with pre-development levels.

An assessment of detention and attenuation requirements was undertaken to assess the need for an OSD on the Proposal site. The assessment indicated that, due to timing of discharge from the

Proposal site combined with the flow from the larger catchment within the Upper Cooks River as well as the proposed flood storage system, the provision of a traditional OSD would result in adverse impacts to the surrounding catchment. Further to this, it was found that the proposed flood detention basin (DA 366/2020) would improve the combined peak stormwater flows in the Upper Cooks River drainage channel compared to the pre-development scenario. As such, and as agreed with Council, no OSD is proposed for the development.

A Draft Stormwater Management Plan has been prepared for the Proposal and is provided in Appendix L to further management stormwater from the Proposal.

9.5.3 Flooding

As a result of the flood mitigation works undertaken under DA 366/2020, including the development of the flood detention basin in the west of the Chullora RRP site, there would be an overall reduction in flood levels through the southern portion of the Chullora RRP site and an elimination of overland flows onto Muir Road when compared to the pre-flood mitigation works conditions. Therefore, the effects of flooding from the Proposal are considered compliant with the Council flood risk management policy and allowances of the engineering standards noted in Section 9.2.

As noted in Section 9.3.3, the Proposal would be constructed on an established earthworks platform 0.5 m above the one per cent AEP flood level and therefore would have flood immunity. Due to this the Proposal would not be adversely impacted by flooding.

It is noted that the Proposal site is within the PMF extent which poses a risk to the safety of employees should this (highly unlikely) event occur. It is possible that the Proposal site would have immunity to the PMF given a 0.5 m freeboard above the one percent AEP has been established to ensure adequate flood immunity for the Proposal site. The egress from the Proposal site would be to areas to the north of the Chullora RRP (via Muir Road and Rockwood Road) which are not affected by PMF flooding. The north western corner of the Chullora RPP is raised above the PMF level (refer Figure 9-3 and can be easily reached on foot within minutes from the Proposal site. A Flood Emergency Response Plan will be developed for the operational phase of the Proposal (refer Section 9.6).

9.5.4 Water Use

The key demand for onsite water relates to the following activities:

- Internal potable water (e.g. employee showers and inside tap use)
- Internal non-potable (e.g. toilet flushing)
- Fire and dust management services (e.g. sprinklers and fire service tanks).

Two above ground 25 kL rainwater tanks would be installed within the product storage area of the MRF and would collect rainwater from roof areas, providing a valuable onsite non-potable water supply for the MRF. There may be opportunity to further use water captured from the Proposal for non-potable uses across the broader Chullora RRP (e.g. for landscaping irrigation). The addition of the rainwater harvesting system would also be of significant benefit in reducing stormwater run-off into the stormwater drainage system.

Any residual water demand would be supplied by the Sydney Water mains network.

Fire services are predicted to require total storage of 3,072 kilolitres (kL). Assuming two annual services of this storage, the total annual demand is estimated to be 6,144 kL which correlates to approximately 16.8 kL per day. This water demand would be supplied wholly by the Sydney Water mains network.

While not comprising part of the Proposal allowance has been made within the water balance model for external irrigation and landscaping, which has been estimated to equate to 1.4 kL per day. This assessment was based on an application regime dependent on yearly climatic variations (i.e. more applications would be made in drier months and less in wetter months).

The total daily water demand for the Proposal site is presented in Table 9-5 below. As shown, the anticipated water requirements of the Proposal are estimated to be 19.74 kL per day or approximately

7.5 ML per year. Of this total, rainwater harvesting would supply approximately 50 per cent on the non-potable water demand.

Table 9-5 Operational water use demand

Area	Daily Demand (kL/ day)	Daily Supply (kL/day)	
	Total	Rainwater harvesting	Mains
Internal (potable)	1.125	0.34	1.46
Internal (non-potable)	0.675		
Irrigation and landscaping	1.4	0.7	0.7
Fire services	16.8	-	16.8
Total		**1.04**	**18.7**

Given the industrial setting of the Proposal site, surrounding industrial land uses and the provision of a rainwater harvesting system, the water demands identified above are not considered to be a significant impact.

9.6 Mitigation measures

The Proposal would not have an adverse impact on water or hydrology, with all aspects found to be complaint with their respective objectives and targets. Table 9-6 outlines the mitigation measures SUEZ will implement to further minimise any water and hydrology impacts.

Table 9-6 Mitigation measures (water and hydrology)

ID	Mitigation measures	Timing
WH1	A CEMP, or equivalent, will be prepared for the Proposal to minimise water and hydrology related impacts and will include the following: • An ESCP prepared in according with the Blue Book (Landcom, 2004) including: – Type and location of erosion and sediment controls – Inspection and maintenance regimes following rainfall events • Construction traffic access points. Construction traffic will be restricted to delineated access tracks, and maintained until construction complete	Construction
WH2	A PIRMP and an Emergency Response Plan will be prepared for the Proposal to outline the procedure to be followed in the event of an incident or emergency during construction and operation. The PIRMP will cover the following types of emergency or incident: • On-site spills or leaks • Off-site discharges • Flooding • Fire. The PIRMP will include:	Construction and operation

ID	Mitigation measures	Timing
	• Training and induction protocols. Induction will be provided to all staff and subcontractors outlining their responsibilities in the event of an emergency or incident • Incident response in the case of a fire, including: – Protocols for the containment and disposal of fire water • Notification requirements and timeframes to applicable authorities in the event of an emergency or incident • The location and content of a spill kit. A spill kit will be present on site at all times Review regimes of the PIRMP. Regular reviews and updates will be made for the PIRMP as required.	
WH3	A OEMP, or equivalent, will be prepared for the Proposal to minimise water and hydrology related impacts and will include the management, maintenance and cleaning schedule to ensure that stormwater management system devices are regularly inspected and cleaned.	Operation
WH4	A Flood Emergency Response Plan (FERP) will be developed for operational phase of the Proposal. The FERP would take into consideration, site flooding and broader flood emergency response plans for the Upper Cooks River catchment. The FERP would also include the following: • Identification of an area of safe refuge within the Proposal site that would allow people to wait until hazardous flows have receded and safe evacuation is possible • Identification of a flood warden and other responsible persons • Procedures for warning staff of potential flood danger. The FERP will be completed in conjunction with Council and NSW State Emergency Service (SES).	Operation

Conclusion

Costin Roe have undertaken a water quality and hydrology assessment in accordance with relevant guidance documents and engineering standards.

The construction related impacts have been assessed as being minimal due to the implementation of erosion and sediment control measures prior to the commencement of construction of the Proposal under the flood mitigation works (DA 366/2020).

Operational water and hydrology impacts were assessed in relation to four aspects: water quality, water quantity (stormwater), flooding and water use. No significant impacts were found to occur against any of these aspects and all aspects were found to be fully compliant with their applicable objectives and targets.

A range of water quality and hydrology features have been incorporated into the Proposal design and are considered in the assessment of potential impacts. Further mitigation measures have been identified to treat any residual impacts.

10 SOILS AND CONTAMINATION

Summary

A desktop review of previous site investigations and available geotechnical and contamination databases was conducted to assess potential risks associated with soil and contamination for the Proposal.

The geology of the Proposal site has been identified as Bringelly Shale comprising claystone, sandstone, shale and siltstone. These soils are characterised by moderately reactive highly plastic subsoil, low fertility and poor soil drainage. Due to these characteristics, the erodibility of these soils is considered high. No known occurrences of acid sulphate soils have been identified on the Proposal site to date and the closest area of known occurrence is located approximately three kilometres west. Salinity risk mapping of the site has indicated that it is a moderate to high risk of salinity (Department of Infrastructure, Planning and Natural Resources (DIPNR), 2003).

Previous contamination assessments undertaken in 1996, 2016, 2018 and 2019 have indicated that elevated concentrations of contaminants were present in several isolated locations in soil, groundwater and sediments on the Chullora RRP site. However, none of these contaminants were identified within the Proposal site boundary and a number of the areas identified would have been subsequently excavated or capped as part of the recent flood mitigation works (DA 366/2020).

This contamination is likely the result of previous industrial activities. The Chullora RRP site was subject to a remediation action plan (RAP) in 2016 following the identification of contamination within soils. Following the validation of these activities, the Proposal site was certified within a Site Audit Report (Enviroview, 2016) and Site Audit Statement (NSW EPA, 2016a) as being suitable for a commercial / industrial land use.

Construction of the Proposal could increase the risk of erosion and sedimentation due to the high erodibility of soils within the Proposal site. However, a number of erosion and sediment controls will have been established as part of the flood mitigation works (DA 366/2020) prior to the construction of the Proposal, minimising any risk of erosion.

During operations, the Proposal site would be capped with permanent hardstand. Due to this, the risk of exposure to existing contaminants is considered low. Accidental spills and leaks may occur during the operation of the Proposal and may have the potential to be transported into the Cooks River and groundwater system if left unmanaged. The highest spill risk would be associated with the operation of the proposed 60 KL diesel storage tank. To minimise the risk of release from the diesel storage tank, the proposed tank would be a self-bunded (double wall) tank compliant with *AS - 1940-2004: The storage and handling of flammable and combustible liquids*.

Construction works will be undertaken under CEMP to manage risks from erosion and sedimentation, prevent contamination, and manage any unexpected finds during works.

In addition, a PIRMP will be implemented during operations to outline procedures to manage spills and leaks and notification procedures in the event of a spill. This would be supported by maintaining a spill kit on site at all times and implementing a refuelling procedure to avoid potential fuel, lubricant or hydraulic fluid spillages.

As stated above, the Proposal site has been certified for the proposed commercial / industrial land use demonstrating that the existing state of the site is suitable for the Proposal development. Should any unexpected contamination be found during the construction or operation of the Proposal, this will be managed under an unexpected finds protocol developed as part of the CEMP and OEMP.

10.1 Introduction

This section includes an assessment of the key soil and contamination related issues identified for the Proposal to address the SEARs issued by DPIE. Table 10-1 provides a summary of the relevant SEARs which relate to soils and contamination, and where these have been addressed in this EIS.

Table 10-1 SEARs (soils and contamination)

SEARs	Where addressed
Soil and water	
An assessment of potential impacts to soil and water resources, topography, hydrology, groundwater, drainage lines, watercourses and riparian lands on or nearby to the site, including mapping and description of existing background conditions and cumulative impacts	Section 10.4 and Section 10.5 (impacts to soil) Chapter 9 (water and hydrology impacts) Appendix L Water and Hydrology Impact Assessment
A description of erosion and sediment controls	Section 4.3.7, Section 9.3.1 and Section 9.4.1 Appendix L Water and Hydrology Impact Assessment
Characterisation of the nature and extent of contamination on the site and a description of proposed management measures	Section 10.3.2

Further to the above, the EES Group require further details on specific requirements relating to their authority. These requirements are discussed throughout the report as indicated in Table 10-2.

Table 10-2 Other agency requirements and relevant report sections (soils and contamination)

Aspect	Where addressed
EES Group	
The EIS must map the following features relevant to water and soils including: • Acid sulfate soils (Class 1, 2, 3 or 4 on the Acid Sulfate Soil Planning Map).	Section 10.3.1

10.2 Methodology

10.2.1 Soils

A review of available information was carried out to identify the soils and geological characteristics of the Proposal site, including:

- The 1:100,000 Soil geological sheet (Chapman and Murphy, 1989) was reviewed to determine the geological setting of the Proposal site
- The *Soil Landscapes of the Sydney 1:100,000* map was reviewed to determine the soil landscape surrounding the Proposal site
- A review of potential acid sulphate soils was conducted by referring to the NSW Department of Land & Water Conservation (DLWC) Acid Sulphate Soil Risk Maps
- A review of salinity risk was conducted by making reference to the NSW Department of Infrastructure, Planning and Natural Resources (DIPNR) Map of Salinity Potential for Western

Sydney – 2002 (DIPNR, 2003) and the Guidelines to Accompany the Map of Salinity Potential for Western Sydney (DIPNR, 2002).

10.2.2 Contamination

A desktop assessment was conducted to understand the potential for contamination associated with the Proposal. The assessment consisted of various desktop database searches and reviews of available information. The databases and information sources consulted included:

- A search of the NSW EPA's Contaminated Land record (NSW EPA, 2020a) and notified sites list (NSW EPA, 2020b). The search was conducted on 25 February 2020
- A review of aerial photographs available for the Proposal site from 1951, 1961, 1970, 1986 and 1994 (provided in Appendix M).

A number of assessments have previously been carried out to determine the nature and presence of contamination across the Chullora RRP site. These assessments included site history reviews, summaries of previous investigations, and soil, groundwater and sediment sampling across the site. Each assessment was comprehensively reviewed to investigate the presence of contamination within the Proposal site and informed the preparation of the following:

- A description of the existing soil characteristics and contamination present onsite
- An assessment of erosion potential at the site and a description of the proposed erosion and sediment controls to be implemented during construction
- An assessment of potential site contamination, salinity and acid sulphate soils, including confirmation that, the Site will be suitable for use as resource recovery facility.

The following historic assessments were reviewed:

- Report on Soil Sampling, Former ELCAR Workshops (Douglas Partners, 1996a)
- Soil Sampling – Former ELCAR Workshops (Douglas Partners, 1996b)
- Detailed Site Investigation (Douglas Partners, 2016)
- Stage II Detailed Site Investigation for Lot 2 (DLA, 2016a)
- Validation Report (DLA, 2016b)
- Remediation Action Plan (DLA, 2016c)

A Site Audit was conducted by Enviroview (2016) to independently review the assessment, remediation and validation activities previously undertaken on the Chullora RRP site. This audit concluded that the site was suitable for commercial / industrial land use and was certified by an accredited NSW EPA site auditor on 19 December 2016 (NSW EPA, 2016a).

In 2018, SUEZ commissioned further investigations to evaluate the presence of soil and groundwater contamination on the Chullora RRP site following the 2017 fire to assess the suitability of the site for further use as an industrial site. These investigations comprise the following reports:

- 15 Muir Road, Chullora, Site Redevelopment Lot 2 – Geotechnical Investigation (PSM, 2018)
- Stage 2 Contamination Assessment – 15 Muir Road, Chullora (ERM, 2019).

The Stage 2 Contamination Assessment (ERM, 2019) report provides the most recent and comprehensive detailed assessment of the soil contamination across the Proposal site and examines the results of previous investigations. However, as groundwater and Cooks River sediment sampling were not included in the 2019 assessment report (ERM, 2019), the Stage 2 Contamination Assessment the Stage II Detailed Site Investigation (DLA, 2016a) provides the most recent data for these parameters.

It is noted the all of the previous contamination investigations applicable to the Chullora RRP site were conducted prior to the completion of recent flood mitigation works (DA 366/2020) proposed by SUEZ across the Chullora RRP (refer Section 2.3). Many of the areas sampled previously have subsequently been excavated and removed or capped as part of the flood mitigation works (or other previous works).

Figure 10-1 and Figure 10-2 present the extent of sampling undertaken during the Stage 2 Contamination Assessment (ERM, 2019) and Stage II Detailed Site Investigation (DLA, 2016a) investigations respectively, noting that these figures show historic aerials of the Chullora RRP prior to the completion of the recently proposed flood mitigation works (DA 366/2020).



Figure 10-1 Test pit and borehole locations (ERM, 2019) (yellow = hand auger; blue = test pits)



Figure 10-2 Groundwater monitoring well and sediment sampling locations (DLA, 2016a)

Assessment guidelines and site investigation levels

The *National Environment Protection (Assessment of Site Contamination) Measure 1999*, as updated 11 April 2013 (the ASC NEPM) is made under the Commonwealth *National Environment Protection Council Act 1994* and is given effect in NSW under section 105 of the CLM Act. The purpose of the ASC NEPM is to establish a nationally consistent approach to the assessment of site contamination and to provide adequate protection of human health and the environment. Considering the proposed land use, a commercial / industrial land use scenario was adopted.

The ASC NEPM establishes health and environmental investigation and screening levels for contaminants in different media, including those contaminants identified as contaminants of potential concern (CoPC) at the site. The guideline values applicable to the Proposal site under the ASC NEPM are outlined in Table 10-3 below.

Table 10-3 ASC NEPM guideline values

Guidelines	Description
Health investigation levels (HILs)	Developed for a broad range of metals and organic substances, including pesticides. The HILs are to be used in the first stage (Tier 1) of assessing human health risk via all relevant pathways of exposure, such as direct ingestion and dermal contact. As the Proposal would use the land for industrial purposes, the HIL guideline values that are generally applicable are the HIL D – Commercial / Industrial.
Health screening levels (HSLs)	Developed for petroleum hydrocarbons dependent on soil physicochemical properties, as these affect vapour movement. HSLs have been developed for different soil types, land uses and depths below ground level. Under the current Proposal, the HSL guideline values that are applicable are HSL D – Commercial / Industrial, Sand
Health screening levels for asbestos contamination in soil	Adopted within the ASC NEPM for bonded asbestos containing material (ACM), friable asbestos and all forms of asbestos. The HSLs for asbestos are prescribed for industrial and commercial sites, based on a percentage weight of asbestos material in the soil.
Ecological investigation levels	Calculated for certain contaminants based on specific soil physicochemical properties (such as % clay, cation exchange capacity, and pH) and land use scenarios and generally apply to the top two metres of soil.
Ecological screening levels	Broadly apply to petroleum hydrocarbons in coarse and fine soils for various land uses.
Groundwater investigation levels (GILs)	GILs are based on Australian water quality guidelines and drinking water guidelines and are applicable for assessing human health risk and ecological risk. GILs are established under the ASC NEPM for fresh water, marine water and drinking water. Freshwater GILs have been adopted as a conservative approach as the receiving water body is considered to be Cooks River, which may support freshwater ecosystems downstream in less industrialised areas. The site is located within the Botany Basin Groundwater Extraction Exclusion area, where the use of groundwater for any purpose is banned. As such, the drinking water GILs have not been adopted
Petroleum hydrocarbon management limits	Applicable to petroleum hydrocarbon compounds only. These management limits applicable as screening levels following evaluation of human health and ecological risks and risks to groundwater resources. They are relevant for assessing risks to subsurface infrastructure and the risk of fire or explosion. The Management Limits adopted for the Proposal are based on the commercial /industrial use of the site and the coarse nature of the soils on site.

Where the ASC NEPM does not provide screening criteria, additional criteria may be adopted, with preference given to Australian criteria over international guidance. ANZECC and Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) introduced toxicant default guideline values (DGV) for sediments. These guidelines values have been developed with the following assumptions:

- The DGV are based on limited sediment toxicity data and are not available for all contaminants
- Low and high DGVs have been developed where sufficient toxicity information is available
- The low DGV represents a level below which effects on biota are rarely seen
- The high DGV represents a concentration where toxicity-related adverse effects may already be observed and is an indicator of potential high-level toxicity problems rather than ensuring the protection of ecosystems as the ASC NEPM guidelines are intended to do.

The adopted criteria, and a summary of exceedances against the criteria, is presented in Section 10.4 and Section 10.5.

10.3 Existing environment

As noted in Section 2.3, through implementation of flood mitigation works of the Chullora RRP (DA 366/2020), new baseline site conditions for the Proposal site will be established, including being cleared of vegetation, raised above the required 1:100 year flood event level, levelled for construction, and with a flood detention basin installed along the western extent of the Chullora RRP.

10.3.1 Soils

Soil type and erodibility

The Proposal site is mapped on the 1:100 000 Sydney geological sheet (Chapman and Murphy, 1989), as being underlain by Triassic-aged Bringelly Shale of the Wianamatta Group. Bringelly Shale typically comprises claystone, finely interlaminated siltstone and sandstone (laminate), shale, medium to fine grained sandstone, and rare coal derived from alluvial and estuarine environments.

A review of the *Soil Landscapes of Sydney 1:100,000* map determined that the Proposal site is located in the Blacktown Landscape Group. The soils within this group are characterised by moderately reactive highly plastic subsoil, low fertility and poor soil drainage. The soil landscape is also characterised by level plain to hummocky terrain which has been extensively disturbed by human activity, with most of the original soil either removed, buried or greatly disturbed. The erodibility of these soil materials is considered to be high, with a potentially very high to extreme erosion hazard.

Geotechnical investigations (PSM, 2018) and the comprehensive soil sampling program undertaken as part of the Stage 2 Contamination Assessment (ERM, 2019) identified the soil profile, below the raised foundation, to be primarily variable fill material comprising ash and slag, clay, sandy clay, silty clay, gravel, sandstone cobbles, sand and crushed orange sandstone. Anthropogenic materials were also observed including fragments of brick, concrete, plastic, metal, glass, ceramic, bitumen, tile and suspected ACM, as well as buried concrete slabs and intermittent layers of solid black tarry material.

Erosion and sediment controls will have been implemented as part of the flood mitigation works (DA 366/2020) prior to the commencement of the construction of the Proposal. The existing controls that will be in place are described in Section 9.3.1 and include:

- Provision of sediment basins to capture sediment laden run-off from the Proposal site
- Diversion drains to direct the Proposal site runoff into sediment basins
- Highly visible silt fencing to prohibit unnecessary site disturbance and to ensure untreated runoff does not leave site
- Stabilised access points of vehicle access.

Acid sulphate soils and salinity

A review of the 1:25,000 'Liverpool Acid Sulphate Soil Map' indicates that there are no known occurrences of acid sulphate soils (ASS) in the vicinity of the Proposal site. The closest mapped area of acid sulphate soils is located approximately three km west of the Proposal site, as shown in Figure 10-3.

A review of the DIPNR Map of Salinity Potential for Western Sydney (DIPNR, 2002) indicates that the Proposal site has a moderate to high salinity potential. Areas of high salinity potential are defined as those places where soil, geology, topography and groundwater conditions predispose a site to salinity, such as lower slopes and streamlines. Areas of moderate salinity potential are those areas where Wianamatta Group shales are found. Groundwater sampling undertaken on the Proposal site by DLA (2016b) indicated that the groundwater on the site was typical of brackish environments, often associated with Wianamatta Group shales. Figure 10-4 shows the salinity potential of the Proposal site.



LEGEND

- Chullora RRP site boundary
- Proposal site
- Future stage
- Flood detention basin
- Major road
- Railway

Acid sulphate soil risk

- High probability of occurrence
- Low probability of occurrence
- No known occurrence

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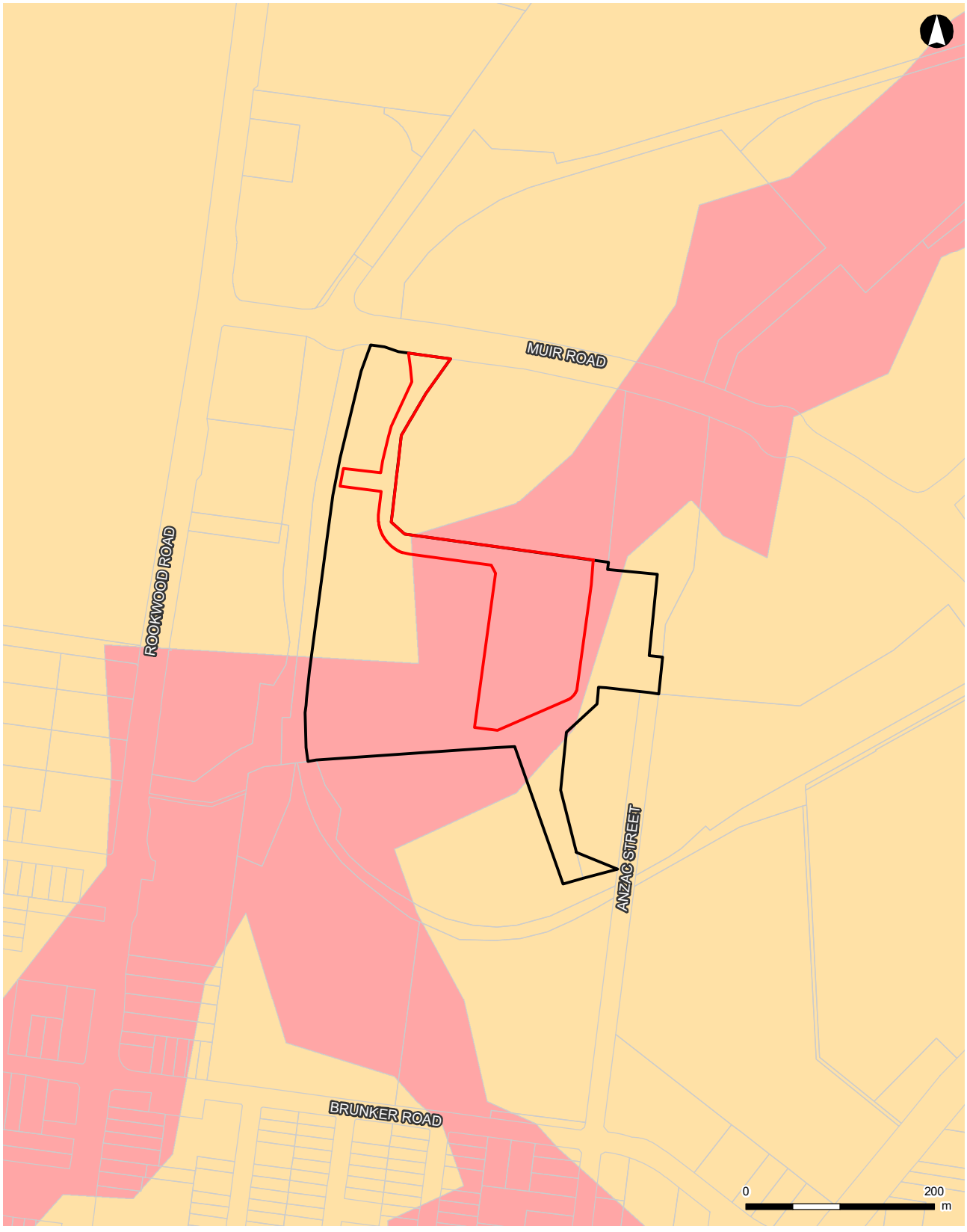
Coordinate System: GDA 1994 MGA Zone 56
Date issued: August 4, 2020
Aerial imagery source: NSW LPI

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Figure 10-3: Area of known acid sulphate soils



LEGEND

Chullora RRP site boundary
Proposal site
Property boundary

Salinity potential
High
Moderate

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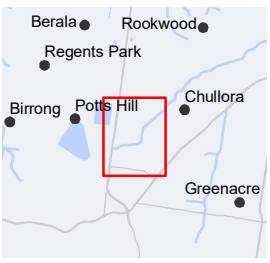


Figure 10-4: Salinity potential of the Proposal site

10.3.2 Contamination

Soils

As outlined in Section 2.3 of this EIS, the Chullora RRP site was used for industrial uses since at least the 1930s. Specifically, the Chullora RRP site was part of the Electric Car (ELCAR) workshops consisting of a main workshop shed, paint shop, compressor building and fuel storage facilities. These workshops remained until 1994 when the Proposal site was redeveloped as the Chullora RRC. The Chullora RRC operated until 2017 when it was subject to a fire that resulted in the demolition of the main warehousing facilities on site as well as the associated hardstand. A review of aerial photographs to determine the history of the Proposal site and surrounding land uses are presented in Table 10-4. These aerial photographs are presented in Appendix M.

Table 10-4 Aerial photograph review

Year	Description of Proposal site	Description of surround land
1951	There appears to be a large workshop facility in the centre of the site surrounded by two smaller warehouses to the north and east.	The land to the north is mostly vacant. The west and south of the site consist of small residential buildings along Rookwood Road. To the south-east of the site is the Chullora Railway and Migrant Camp.
1961	Photo is not clear enough to discern changes to the site.	Continued industrial development to the north-east of the site.
1970	An additional warehouse has been built in the southern part of the site. Rail sidings have been constructed on the western side of the site, adjacent to the main warehouse.	Continued residential development to the west of the site. The Chullora Railway and Migrant Camp has been removed and the area appears to be vacant. A railway terminal appears to the north of the site.
1986	The site remains relatively unchanged.	Large warehouse facilities appear on the land vacated by the Chullora Railway and Migrant Camp to the east and southeast of site. Areas to the west, south and north are relatively unchanged.
1994	The site remains relatively unchanged.	Additional warehouses appear to the north of the site, adjacent to the railway terminal. Continued industrial development has occurred to the west of site.

Based on the previous industrial land uses on the Proposal site, potential sources of contamination and associated CoPC that may have occurred as a result of these activities are outlined in Table 10-5 below.

Table 10-5 Potential sources of contamination

Potential source	Description	CoPC*
Fill material of unknown origin and quality	Importation of potentially contaminated filling soils	Heavy metals, TRH, BTEX, PAH, OC/OP, PCB, asbestos
Demolition of former buildings potentially containing hazardous materials	• Buildings with asbestos present • Substation	Asbestos, lead
Former rail related workshop activities	• Metal casting • Metal fabrication and soldering	Heavy metals, TRH, BTEX, PAH, PCB

Potential source	Description	CoPC*
	• Manufacture/storage of chemicals • Stockpiling of contaminated waste	
Rail sidings	• Metal fabrication and soldering	Asbestos, heavy metals
Fuel storage	• Fuel spills and leakage	TRH, BTEX, lead
Former resource recovery activities (i.e. processing)	• Storage of contaminated waste	Heavy metals, TRH, BTEX, PAH
Adjacent land uses	• PFD Storage Warehouse • BP petrol station • Veolia Transfer Station • BlueScope steel • Galserv Galvanising Services • Nepean Building and Infrastructure	Asbestos, petroleum hydrocarbons, heavy metals

* Heavy Metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn); TRH: Total Recoverable Hydrocarbons; BTEX: Benzene, Toluene, Ethylbenzene, Xylene; PAH: Polycyclic Aromatic Hydrocarbons; OC/OP: Organochlorine / Organophosphorus Pesticides; PCB: Polychlorinated Biphenyls.

The Stage 2 Contamination Assessment (ERM, 2019) investigation identified contamination across the Chullora RRP site present within underlying fill containing foreign materials, including fragments of ACM at four locations in the central and southwestern sections of the Chullora RRP site. Further laboratory analysis of the surface soils also indicated the presence of asbestos fines / friable asbestos (AF/FA) at concentrations above the adopted assessment criteria. In addition to ACM, soil samples also revealed the presence of benzo(a)pyrene toxic equivalence factor (BaP TEQ), and Total Recoverable Hydrocarbons (TRH) which exceeded the applicable guideline criteria.

Table 10-6 provides a summary of guideline exceedances identified within soils across the Chullora RRP site during the 2019 investigation. Figure 10-5 identifies the location of these exceedances. As shown in Figure 10-5 none of the areas where contamination was previously identified within soil samples are located within the Proposal boundary. Further a number of the samples (S1, S2 and S6) are located within areas of the Chullora RRP that will be have been excavated and / or capped as part of the flood mitigation works (DA 366/2020).

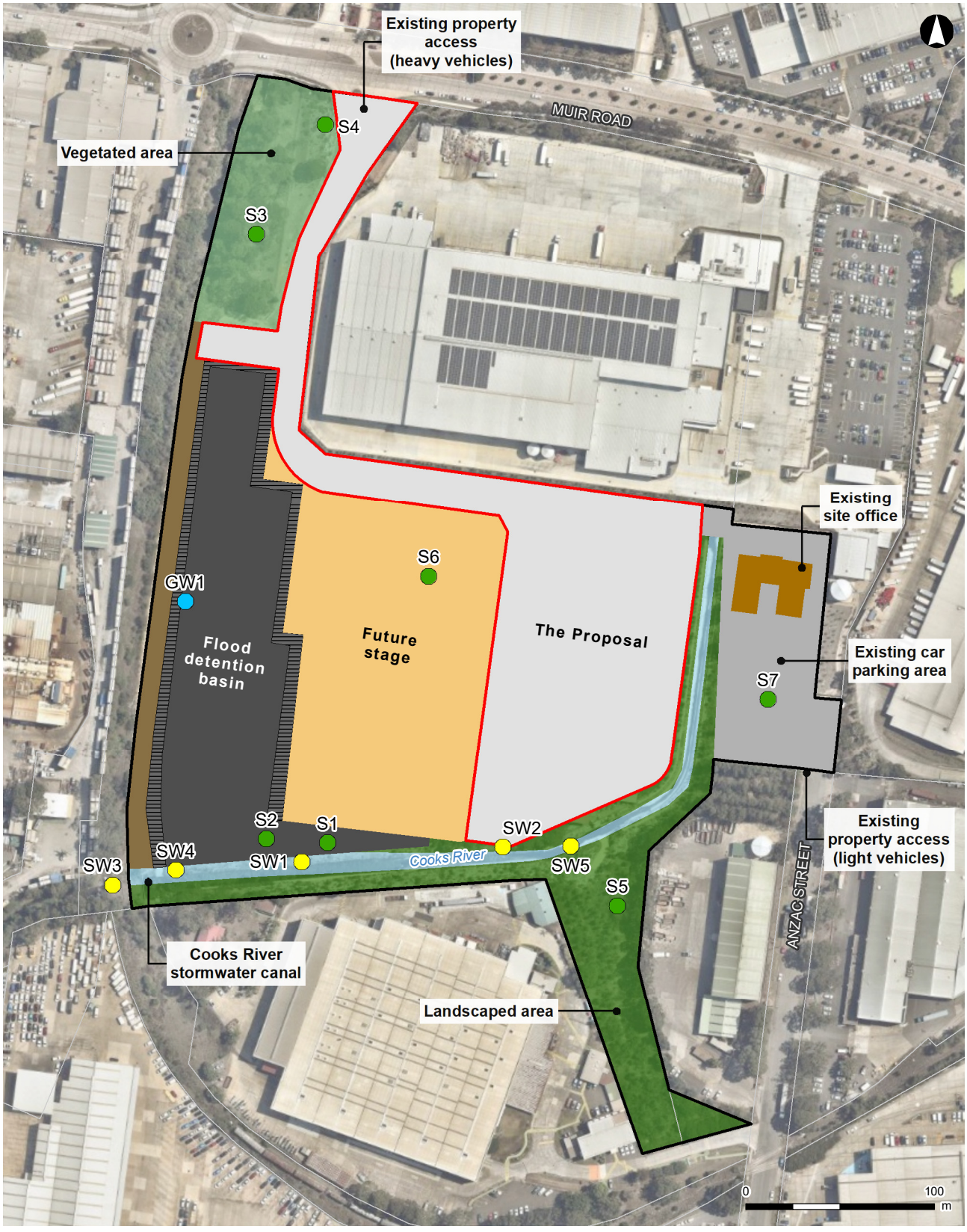
Despite the presence of the soil contamination identified across the broader Chullora RRP site, it has been assessed as being suitable for a commercial / industrial land use as per the Site Audit Statement.

Table 10-6 Soil contamination identified on the Proposal site (ERM, 2019)

Sample ID	Contaminant	Depth (m)	Sample result	Criterion	Guideline
Soil (S) 1	AF/FA	0.5	0.0014 % w/w	0.001 % w/w	Asbestos HSL
S2	AF/FA	1.0	0.0020 % w/w	0.001 % w/w	Asbestos HSL
S3	AF/FA	0.1	0.0953 % w/w	0.001 % w/w	Asbestos HSL
S4	AF/FA	0.5	0.0015 % w/w	0.001 % w/w	Asbestos HSL
S5	AF/FA	0.4	0.0904 % w/w	0.001 % w/w	Asbestos HSL

Sample ID	Contaminant	Depth (m)	Sample result	Criterion	Guideline
S6	BaP TEQ	0.3	210 mg/kg	40 mg/kg	HIL D
S7	TRH (F3)	0.2	3,900 mg/kg	3,500 mg/kg	Management Limit

AF/FA: asbestos fines/friable asbestos; BaP TEQ: benzo(a)pyrene toxic equivalence factor; TRH: Total Recoverable Hydrocarbons: >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4).



LEGEND

- Chullora RRP site boundary
- Proposal site
- Future stage
- Established earthworks
- Batter
- Flood detention basin
- Property boundary
- Groundwater contamination
- Soil contamination
- Surface water and sediment contamination

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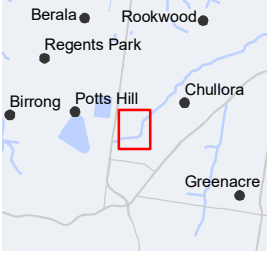


Figure 10-5: Contamination identified within the Chullora RRP site

Groundwater

The groundwater characteristics associated with the Proposal site are detailed in Section 9.3.1. A search of the NSW EPA contaminated land database identified one record for notification of a contaminated site within one km of the Proposal site at Galserv Galvanising Services (117-153 Rookwood Road Yagoona), located approximately 150 m west of the Proposal site. Contamination affecting the property included:

- Groundwater in the eastern part of the property contaminated with high concentrations of metals including zinc (Zn), lead (Pb), cadmium (Ca), copper (Cu), nickel (Ni) and arsenic (As), as well as ammonia (NH_3)
- Some areas of the soil are contaminated by petroleum hydrocarbons and asbestos in the southern portion of the property.

The Galserv site is located hydraulically upgradient of the Proposal site and there is potential that contaminated groundwater may migrate underneath the Proposal site.

The most recent groundwater sampling, undertaken by DLA (2016a), was conducted across three monitoring wells on the Chullora RRP site. Exceedances against the criteria for zinc were identified in one monitoring well in the western portion of the Chullora RRP site described in Table 10-7 and shown in Figure 10-5. DLA (2016a) did not consider the concentrations of heavy metals in the groundwater elevated enough to prevent the site from being suitable for a commercial / industrial land use nor did the Site Auditor who issued an Site Audit Report and Site Audit Statement for the site in December 2016.

Elevated levels of Ni, Zn and dichlorodiphenyltrichloroethane (DDT) were identified within groundwater samples taken on the site directly north of the Proposal (Douglas Partners, 2016). Due to the north-easterly flow direction of the local groundwater aquifer (refer Section 9.3), it is not considered that these contaminants would impact the Proposal site.

Table 10-7 Groundwater contamination identified on the Proposal site (DLA, 2016a)

Sample ID	Contaminant	Depth (m below top of casing)	Sample result	Criterion	Guideline
GW 1	Zinc	0.737	14 µg/L	8 µg/L	Freshwater GIL

Sediment

Sediment samples collected from Upper Cooks River, located to the south of the Proposal boundary, identified elevated concentrations of heavy metals (Cu, Ld, mercury (Hg), Ni and Zn) and detectable concentrations of TRH (DLA, 2016a). Analysis of these samples concluded that, due to the distribution of the contamination present in the river and known values of surface water velocity and sediment load, contamination was likely to be sourced from upstream and surrounding industrial land uses, rather than previous activities occurring on the Proposal site. Further detail on the existing characteristics of the Upper Cooks River is provided in Section 9.3.1.

Table 10-8 provides a summary of the guideline exceedances within the Cooks River, adjacent to the Proposal site. Figure 10-5 identifies the location of these exceedances.

Table 10-8 Cooks River sediment contamination (DLA, 2016a)

Sample ID	Contaminant	Sample result	Criterion	Guideline
Sediment (SW) 1	Cu	260 mg/kg	65 mg/kg	Low DGV
	Pb	240 mg/kg	220 mg/kg	High DGV
	Ni	49 mg/kg	21 mg/kg	Low DGV

Sample ID	Contaminant	Sample result	Criterion	Guideline
	Zn	680 mg/kg	410 mg/kg	High DGV
SW 2	Ni	34 mg/kg	21 mg/kg	Low DGV
	Zn	770 mg/kg	410 mg/kg	High DGV
SW 3	Cu	120 mg/kg	65 mg/kg	Low DGV
	Pb	65 mg/kg	50 mg/kg	Low DGV
	Zn	500 mg/kg	410 mg/kg	High DGV
SW 4	Cu	200 mg/kg	65 mg/kg	Low DGV
	Pb	170 mg/kg	50 mg/kg	Low DGV
	Hg	0.2 mg/kg	0.15 mg/kg	Low DGV
	Ni	37 mg/kg	21 mg/kg	Low DGV
	Zn	1,800 mg/kg	410 mg/kg	High DGV
SW 5	Cu	350 mg/kg	270 mg/kg	High DGV
	Pb	320 mg/kg	220 mg/kg	High DGV
	Ni	46 mg/kg	21 mg/kg	Low DGV
	Zn	780 mg/kg	410 mg/kg	High DGV

On 23 February 2017, a fire occurred at the Proposal site, and uncontrolled fire water was released into the Cooks River, with a fish kill observed downstream on the following day. It was understood that no surface water sampling was undertaken at the time, however ERM (2019) concluded that per-and-polyfluoroalkyl substances (PFAS), a common contaminant following firefighting activities, was unlikely to be present given the timing of the fire and the phasing out of PFAS foams in 2007, prior to this date (FRNSW, 2019b). Further, there is no record within the public record held by NSW EPA of previous fires which required the use of the fire suppression tanks located on-site.

Contamination summary

The Chullora site has undergone remediation and validation as a result of previous contamination present on the site (DLA, 2016b and DLA, 2016c). While there remains areas of in-situ contamination present on the Chullora RRP site, it has been certified by the Site Auditor to be suitable for commercial / industrial land use and is considered to have met the requirements of the *Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (2nd edition)* (Department of Environment and Conservation (DEC), 2006a). In light of this, an additional RAP would not be required as the Site Auditor has certified that the contaminants present on site are at levels unlikely to be of risk for the proposed land use.

10.4 Construction impacts

The Proposal would be constructed on an existing levelled platform above the 1-in-100 year flood event and would not involve any earthworks or clearing. Due to this, there are unlikely to be any significant soil and contamination related impacts associated with the construction of the Proposal.

10.4.1 Soils

Erosion

Section 10.3.1 concludes that the Proposal site has a high potential for erosion and sedimentation due to the highly plastic and poor soil drainage characteristics. A number of erosion and sediment controls will have been established as part of the flood mitigation works (DA 366/2020) prior to the construction of the Proposal, minimising any risk of erosion. Potential construction impacts associated with erosion and sedimentation are assessed in detail in Section 9.4.1.

Acid sulphate soils

Acid sulphate soils are relatively stable when they are not exposed to air. If sulphide bearing or pyritic soils are disturbed by excavation or dewatering, thereby creating an exposure pathway to air, an oxidation process takes place resulting in the generation of sulphuric acid, or acid sulphates. If these acid sulphates accumulate, they can negatively impact the environment and damage infrastructure. Given that construction does not involve any earthworks and that no ASS have been identified as present within the Proposal site, the likelihood of disturbing ASS is considered negligible (refer to Figure 10-3).

Salinity

There is a moderate to high potential for saline soils to occur with the Proposal site however, due to the short construction phase of the Proposal and limited construction activities (i.e. no earthworks) it is unlikely that construction of the Proposal would result in an increase in salinity risk to the site through the migration of groundwater to the surface.

10.4.2 Contamination

Exposure to previously buried contamination can create potential exposure pathways that lead to risks to both human health and the environment. Potential exposure pathways for contamination may include:

- Direct dermal contact with contaminated soil or groundwater
- Inhalation of contaminated dust or vapour
- Ingestion of contaminated dust
- Mobilisation and / or exposure of contaminants in soil or groundwater through construction activities.

The Proposal would be constructed on an existing earthworks foundation established above the 1-in-100 year flood level during the development of the flood mitigation works (DA 366/2020) and would involve minimal disturbance of soils and no interaction with groundwater. Further, no areas of contamination have been identified within the Proposal site boundary. It is therefore considered extremely unlikely that construction activities would pose a risk of contamination exposure.

Some construction activities may pose a risk of causing contamination if not managed appropriately. During construction, fuels and chemicals required for construction would be stored on the Proposal site and within construction compounds. There is potential for fuels and chemicals to spread to the surrounding environment, including the soil and the Cooks River, through spills and leaks.

Any disturbances to soil and groundwater contamination can be appropriately managed via appropriate the site mitigation measures identified in Section 10.6 and Section 9.6.

10.5 Operation impacts

10.5.1 Soils

The Proposal site would minimise sedimentation risks by diverting and distributing stormwater via a management system, as further addressed in Section 9.5.1. Operation of the site would not involve disturbance to soils; operational impacts on Proposal site soils are therefore considered negligible.

10.5.2 Contamination

The Proposal site would be capped with permanent hardstand and the risk of exposure to existing contaminants within the broader Chullora RRP site are considered negligible.

There is a risk of contamination to the Proposal site associated with the storage and handling of oils, fuel, lubricants and other chemical substances stored on the site for the maintenance and operation of vehicles, plant and machinery. Any chemicals would be stored within a designated dangerous goods handling area within the workshop, presenting a minimal risk of contamination. There is a potential risk of contamination during operation associated with the operation of the proposed 60 KL diesel storage tank. To minimise the risk of release from the diesel storage tank, the proposed tank would be a self-bunded diesel tank compliant with AS - 1940-2004 *The storage and handling of flammable and combustible liquids*. Further details on the storage and handling of fuels and chemicals associated with the Proposal are provided in Section 12.5.1.

10.6 Mitigation measures

The contamination present on the Proposal site is not considered a risk during the construction or operation of the Proposal. As stated above, the Chullora RRP site has been certified within the Site Audit Report (Enviroview, 2016) and Site Audit Statement (NSW EPA, 2016a) as being suitable for a commercial / industrial land use, demonstrating that the existing contaminated state of the site is suitable for the Proposal development.

Should any unexpected contamination be found during the construction or operation of the Proposal, this will be managed under an unexpected finds protocol developed as part of the CEMP and OEMP. Details of mitigation measures to be included in these plans are outlined below.

Table 10-9. Mitigation measures (soil and contamination)

ID	Mitigation measures	Timing
SC1	A CEMP, or equivalent, will be prepared for the Proposal to minimise soil and contamination related impacts and will include the following: • Maintenance requirements for erosion and sediment controls established across the Proposal site • A contingency plan for disturbance of unexpected contaminated materials (unexpected finds protocol), such as materials that are odorous, stained or containing anthropogenic materials, that may be encountered during construction • The location and content of a spill kit. A spill kit will be present on site at all times	Construction
SC2	A PIRMP will be prepared for the Proposal to outline the procedure to be followed in the event of a chemical spill or leak during construction and operation. This will include notification requirements and use of absorbent material to contain the spill or leak.	Construction / Operation

ID	Mitigation measures	Timing
SC3	An OEMP, or equivalent, will be prepared for the Proposal to minimise contamination related impacts and will include the following: • A refuelling procedure that will be implemented for all refuelling activities undertaken. Any fuel, lubricant or hydraulic fluid spillages will be collected using absorbent material, and contaminated material would be transported to a licensed waste facility for disposal • The location and content of a spill kit. A spill kit will be present on site at all times	Operation

Conclusion

Previous soil and contamination assessments undertaken in 1996, 2016, 2018 and 2019 have indicated that elevated concentrations of contaminants are present in several isolated locations in soil, groundwater and Cooks River sediments across the Chullora RRP site. However, none of these contaminants were identified within the Proposal site boundary and a number of the identified locations have been subsequently excavated or capped. A Site Auditor has deemed the Chullora RRP site suitable for commercial / industrial use in 2016.

Impacts during the construction of the Proposal are primarily associated with the risk of erosion and sedimentation during hardstand placement and spills and leaks for construction plant and equipment more broadly. These risks were found to be very minor and will be managed under the protocols of the CEMP.

During operation, the Proposal site would be capped with permanent hardstand and the risk of exposure to existing contaminants is considered negligible. Chemicals will be stored on site for the maintenance and operation of vehicles, plant and machinery which could pose a risk of contamination if spills and leaks occur. A PIRMP will be developed for the operation of the Proposal and will specify the procedure to be followed in the event of a spill or leak to minimise impacts to the environment.

11 NOISE AND VIBRATION

Summary

Wilkinson Murray have undertaken a Noise and Vibration impact assessment (NVIA) to assess the noise and vibration associated with the Proposal (Appendix N).

The noise and vibration impacts from the construction and operation of the Proposal were assessed in relation to 18 noise catchment areas (NCAs) and six industrial receivers. A range of noise management levels (NML) and vibration criteria were developed in accordance with the following:

- *Interim Construction Noise Guideline* (ICNG) (DECC, 2009)
- *Assessing Vibration: A Technical Guideline* (DEC, 2006b)
- *Noise Policy for Industry (NPfI)* (NSW EPA, 2017b)
- *Road Noise Policy (*Department of Environment, Climate Change and Water (DECCW), 2011)
- *Construction Noise Strategy* (Transport Construction Authority (TCA), 2012)

Noise impacts associated with the construction of the Proposal were assessed for the three phases of construction. The predicted noise levels are not anticipated to exceed the established NML with the exception of one minor temporary exceedance (by one decibel A-weighted (dBA)) identified at one NCA during one stage of construction. Given the temporary and minor nature of this exceedance the construction impacts are generally considered acceptable. No vibration impacts were identified during construction.

Noise impacts associated with the operation of the Proposal were assessed in relation to a worst-case operational noise scenario involving 24/7 operation of the MRF with all roller doors open, along with peak truck movements. The noise levels at sensitive receivers during this scenario were all predicted to comply with the established NMLs. The road noise impacts associated with the operation of the Proposal demonstrated that the increase in noise from the existing conditions is negligible and complies with the RNP.

Despite no significant noise related impacts being identified, a range of management and mitigation measures will be incorporated into the CEMP and OEMP to minimise the unnecessary generation of noise during construction and operation.

11.1 Introduction

Wilkinson Murray have undertaken an assessment of the noise and vibration related impacts associated with the Proposal to address the SEARs issued by DPIE. The Noise and Vibration Impact Assessment (NVIA) for the Proposal is provided in Appendix N of this EIS. Table 11-1 provides a summary of the relevant SEARs which relate to noise and vibration, and where these have been addressed in this EIS.

Table 11-1 SEARs (noise and vibration)

SEARs	Where Addressed
11.Noise and Vibration	
A quantitative assessment of construction, operational and transport noise and vibration impacts in accordance with relevant Environment Protection Authority guidelines. This is to include the identification of existing and potential future sensitive receivers and consideration of approved and/or proposed developments in the vicinity of the site	Section 11.4 and Section 11.5 Appendix N NVIA
Details and justification of the proposed noise mitigation and monitoring measures	Section 11.6

SEARs	Where Addressed
	Appendix N NVIA
Specified times of operation for all phases of the development and for all noise producing activities	Section 4.4.2 and Section 4.5.9

Further to the above, the EPA require further details on specific requirements relating to their authority. There requirements are discussed throughout this EIS and are provided in Table 11-2 below.

Table 11-2 Other agency requirements and relevant report sections (noise and vibration)

Aspect	Where Addressed
EPA	
Noise including potential impacts and mitigation measures.	Section 11.4 and Section 11.5 (potential impacts) Section 11.6 (mitigation measures) Appendix N NVIA

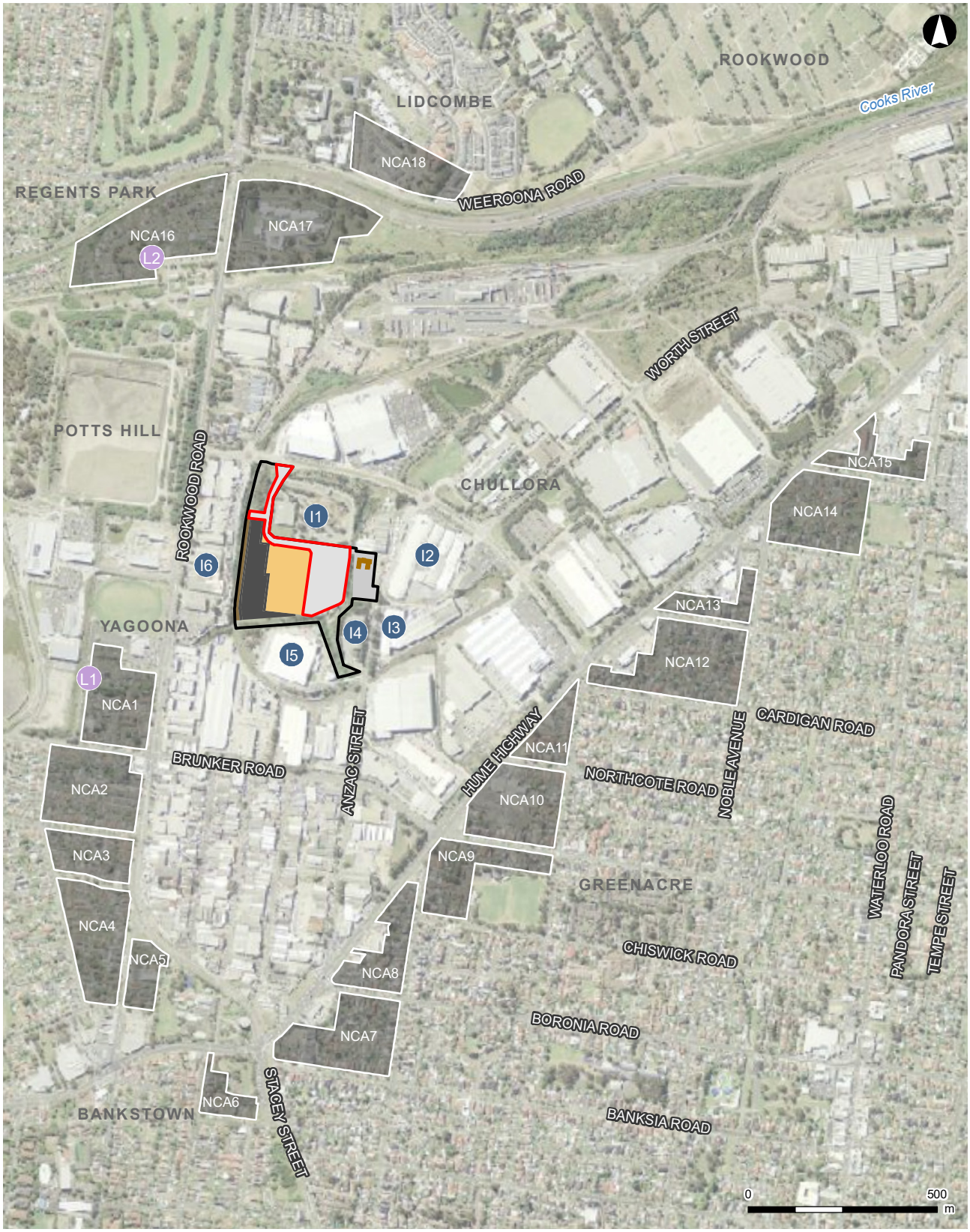
11.2 Methodology

The following steps have been followed to identify the potential noise and vibration impacts from the Proposal:

1. Sensitive and nearby industrial receivers were identified
2. Background noise levels and meteorological conditions were determined
3. Noise and vibration criteria were established (including construction, operational and road noise criteria)
4. Impacts were assessed
5. Mitigation measures were identified

11.2.1 Sensitive receivers

The nearest residential receivers to the Proposal site are located in the nearby suburbs of Yagoona, Greenacre, Lidcombe and Regents Park. Eighteen noise catchment areas (NCAs) and six industrial receivers have been identified for the Proposal and are shown on Figure 11-1. The closest residential receiver (NCA1) is approximately 455 m from the Proposal site in Yagoona.



LEGEND

- Chullora RRP site boundary
- Proposal site
- Future stage
- Flood detention basin
- Established earthworks
- Existing car parking area
- Existing site office
- Residential NCAs
- Industry receiver
- Noise logger

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Date issued: August 4, 2020
Aerial imagery source: NSW LPI

1:15,000 at A4

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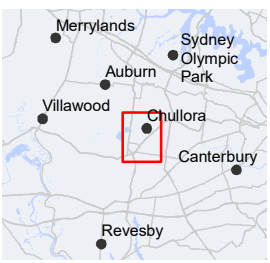


Figure 11-1: Noise monitoring locations and noise catchment areas

11.2.2 Background noise monitoring

Unattended noise monitoring was conducted between 27 November and 5 December 2019 to determine the existing ambient noise levels at the most affected residential receivers in the area surrounding the Proposal. The noise monitoring was undertaken at two locations:

- 14 Graf Avenue, Yagoona (L1) – representative if residential receivers in catchment areas NCA1 – NCA15
- 17 Lewis Street, Regents Park (L2) – representative of receivers in catchment areas NCA16 – NCA18 which are located further from other industrial land uses and major roads.

The location of all NCAs and noise monitoring equipment (noise loggers) in relation to the Proposal site are shown in Figure 11-1.

11.2.3 Meteorological conditions

Certain meteorological conditions may increase noise levels by focusing soundwaves towards a single point. Refraction of sound waves will occur during temperature inversions (where temperature increases with height above ground level) which can vary from hour to hour. Adverse meteorological conditions are to be considered where relevant for an industrial activity. Wind and temperature inversions (during the night-time) under both calm and noise enhancing conditions have been considered within the noise assessment.

11.2.4 Noise and vibration criteria

Construction noise criteria

The Interim Construction Noise Guideline (ICNG) (Department of Environment and Climate Change (DECC, 2009) recommends noise management levels (NML) to reduce the likelihood of noise impacts arising from construction activities. The ICNG NML for residential receivers are shown in Table 11-3 below. The ICNG recommends a noise management level of 75 A-weighted decibels (dBA) for industrial land uses.

Table 11-3 Construction Noise Management Levels

Time of day	Management Level $L_{Aeq,15min}$ (dBA)	How to Apply
Recommended standard hours: • 7 am to 6 pm Monday to Friday • 8 am to 1 pm Saturdays • No work on Sundays or Public Holidays	Noise affected ((RBL) + 10dBA)	The noise affected level represents the point above which there may be some community reaction to noise. Where the predicted or measured LAeq, (15min) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to minimise noise. The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected (75dBA)	The highly noise affected level represents the point above which there may be strong community reaction to noise. Where noise is above this level, the proponent should consider very carefully

Time of day	Management Level $L_{Aeq,15min}$ (dBA)	How to Apply
		if there is any other feasible and reasonable way to reduce noise to below this level. If no quieter work method is feasible and reasonable, and the works proceed, the proponent should communicate with the impacted residents by clearly explaining the duration and noise level of the works, and by describing any respite periods that will be provided.
Outside recommended standard hours (as described above)	Noise affected (RBL + 5 dBA)	A strong justification would typically be required for works outside the recommended standard hours. The proponent should apply all feasible and reasonable work practices to meet the noise affected level. Where all feasible and reasonable practices have been applied and noise is more than 5dBA above the noise affected level, the proponent should negotiate with the community.
Note: RBL = Rating background level, LAeq = Equivalent continuous sound level, dBA = Decibels, A-weighted		

Based on the guideline criteria presented in Table 11-3, NMLs for the NCAs for the construction of the Proposal were developed. It is anticipated that all construction activities would be conducted within standard construction hours. The construction NML for sensitive receivers near the Proposal site are presented in Table 11-4.

Table 11-4 Proposal-specific construction NML

Receiver	Acceptable $LA_{eq,15min}$ noise level (standard daytime construction hours)	Highly noise affected level (dBA)
NCA1-NCA15	48	75
NCA16-NCA18	49	75
I1-I6	75	-
Note: The ICNG recommends an NML of 75 dBA for industrial land uses and therefore there is no highly affected noise level for industrial receivers.		

Construction vibration criteria

The construction vibration assessment was undertaken with consideration of the following factors:

- Human exposure to vibration
- The potential for building damage from vibration.

Human comfort vibration criteria have been used to assess potential vibration impacts from the Proposal. The DEC (2006) *Assessing Vibration: A Technical Guideline* provides guidance for

assessing human exposure to vibration. For simplicity of assessment and monitoring, a peak particle velocity (PPV) goal is preferred. Table 11-5 sets out PPV values for continuous and impulsive vibration as specified by *Assessing Vibration: A Technical Guideline* (DEC, 2006). The impulsive vibration goals are shown in brackets and are the most relevant to activities that create up to three distinct vibration events in an assessment period (e.g. occasional dropping of heavy equipment, occasional loading and unloading).

Table 11-5 Human Comfort Vibration Goals - PPV (mm/s)

Location	Daytime (7.00am-10.00pm) Preferred	Maximum
Residences	0.28 (8.6)	0.56 (17.0)
Offices	0.56 (18.0)	1.1 (36.0)
Workshops	1.1 (18.0)	2.2 (36.0)

There are currently no Australian Standards or guidelines that provide guidance on assessing the potential for building damage from vibration. Given this, the recommended limits for transient vibration were developed on a conservative basis to ensure minimal risk of cosmetic damage to residential and industrial buildings. These guide values are presented in Table 11-6.

Table 11-6 Transient vibration guide values - minimal risk of cosmetic damage

Type of Building	Peak Component Particle Velocity in Frequency Range of Predominant Pulse	
	4 hertz (Hz) to 15 Hz	**15 Hz and above**
• Reinforced or framed structures • Industrial and heavy commercial buildings	50 mm/s at 4 Hz and above	N/A
• Unreinforced or light framed structure • Residential or light commercial type buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

For construction vibration, the dominant frequency of vibration is typically in the range 31.5 – 100 Hz. Because the dominant frequency of vibration cannot be determined with certainty, conservative goals of 20 mm/s for residential buildings and 50 millimetres per second (mm/s) for commercial and industrial buildings have been adopted.

Recommended safe work distances for vibration intensive plant suggested in the Transport Construction Authority's (TCA) *Construction Noise Strategy* (2012) have been adopted in this assessment to evaluate the vibration impacts. Table 11-7 sets out the recommended safe working distances for various vibration intensive plant.

Table 11-7 Recommended Safe Working Distances for Vibration Intensive Plant

Item	Description (kilo newtons (kN))	Safe Working Distance Cosmetic Damage	Human Response
Vibratory Roller	<50 kN (typically 1-2 tonnes)	5 m	15 m to 20 m
	<100 kN (typically 2-4 tonnes)	6 m	20 m
	<200 kN (typically 4-6 tonnes)	12 m	40 m
	<300 kN (typically 7-13 tonnes)	15 m	100 m
	>300 kN (typically 13-18 tonnes)	20 m	100 m
	>300 kN (>18 tonnes)	25 m	100 m

Operational noise criteria

The *Noise Policy for Industry (NPfI)* (NSW EPA, 2017b) provides a framework for assessing environmental noise impacts from industrial premises and industrial development proposals in NSW. The NPfI recommends the development of noise trigger levels, which provide a benchmark for assessing a proposal or site. Noise trigger levels were developed based on the lower value of the intrusiveness noise level and the amenity noise level.

The NPfI stipulates that the intrusiveness noise levels should not be set below 40 dBA during the daytime and 35 dBA in the evening and night-time. Intrusiveness noise level is the noise level 5 dBA above the background noise level for each time period (daytime, evening or night-time) at a sensitive receiver. The intrusiveness noise levels for the Proposal are presented in Table 11-8.

Table 11-8 Operational noise criteria - intrusiveness

Receiver	Time of Day	RBL	Proposal intrusiveness noise level ($L_{Aeq,15min}$)
NCA1-NCA15	Day	38	43
	Evening	40	43
	Night	35	40
NCA16-NCA18	Day	39	44
	Evening	41	44
	Night	37	42
Day = 7:00 am – 6:00 pm; Evening = 6:00 pm – 10:00 pm; Night = 10:00 pm – 7:00 am.			

Amenity noise levels aim to set a limit on the continuing noise level increases from all industrial noise sources within when considered together, to ensure they do not rise above a maximum acceptable level.

To prevent increases in industrial noise due to the cumulative effect of several developments, the amenity noise level for each new source of industrial noise is set at five dBA below the recommended

amenity noise level. Amenity noise levels for sensitive receivers near the Proposal are presented in Table 11-9.

Table 11-9 Proposal amenity noise levels

Receiver	Noise Amenity Area	Time of Day	Recommended Amenity Noise Level ($L_{Aeq,period}$)
Yagoona, South of Boardman Street to Greenacre, North of Como Road	Suburban	Day	55
		Evening	45
		Night	40
Regents Park, South of Amy Street to Lidcombe, South of Main Avenue	Urban	Day	60
		Evening	50
		Night	45
15 Muir Road, Chullora to 153 Rookwood Road, Yagoona	Industrial	When in Use	70

Night-time noise occurring over a short duration have the potential to cause sleep disturbance despite complying with noise trigger levels. Since the Proposal is intended to operate on a 24-hour basis, maximum noise levels need to be considered for potential sleep disturbance.

The NPfI recommends that if the night-time L_{Amax} receiver noise levels from a development exceeds 52 dBA or the RBL plus 15 dBA (whichever is the greater) then a more detailed assessment of potential sleep disturbance impacts is required. Table 11-10 presents the maximum noise trigger levels for the receivers identified in this assessment.

Table 11-10 Maximum noise trigger levels

Receiver	RBL (dBA)	RBL + 15 dBA	Maximum Noise Trigger Level (dBA)
Yagoona, South of Boardman Street to Greenacre, North of Como Road	35	50	52
Regents Park, South of Amy Street to Lidcombe, South of Main Avenue	37	52	52

The Proposal was assessed against a scenario which was developed to represent typical worst-case noise impacts associated with the Proposal. This scenario involves 24/7 operation of the MRF with all roller doors open, along with peak truck movements.

Source sound power levels for road trucks have been taken from previous measurements of similar equipment conducted by Wilkinson Murray on similar sites. Truck noise impacts were modelled with a continuous sound power level of 103 dBA and were assumed to travel at 10 km/hr within the Proposal site.

Road noise criteria

Applicable noise criteria for projects which have the potential to increase traffic on roads are presented in the NSW Road Noise Policy (RNP) (DECCW, 2011). The RNP sets out criteria for assessment of noise from traffic on public roads including assessment criteria for freeways, arterial, sub arterial and local roads. In accordance with the RNP, both Rookwood Road and the Hume Highway are considered arterial roads.

With regard to the permissible increase in road traffic noise from a land use development, the RNP states:

"*For existing residences and other sensitive land uses affected by additional traffic on existing roads generated by land use developments, any increase in the total traffic noise level should be limited to 2 dB above that of the corresponding 'no build option'.*"

The RNP impact assessment criteria for residential land uses impacted by additional traffic on arterial roads are presented in Table 11-11.

Table 11-11 Road Noise Criteria

Road	Category	Assessment Criteria (dBA)	
		Day	Night
Rookwood Road Hume Highway	Arterial	$L_{Aeq, 15\ hour}$ 60 (external)	$L_{Aeq, 9\ hour}$ 55 (external)

11.2.5 Noise modelling

The potential noise emissions for the Proposal were modelled with "CadnaA" noise prediction software which utilised CONCAWE noise prediction algorithms. Factors that were addressed in the noise model include:

- Equipment sound level emissions and location
- Screening effects from barriers
- Receiver locations
- Ground topography
- Noise attenuation due to geometric spreading
- Ground absorption
- Atmospheric absorption.

Noise predictions have been made based on the likely worst-case impacts taking into consideration the anticipated construction activities.

11.3 Existing environment

11.3.1 Existing ambient noise levels

The previous Chullora RRC operated as a consolidated waste facility which would have been a noise generating development, with similar, or greater, noise sources to those associated with the current Proposal. At the time that background noise loggers were deployed the existing activities on the Proposal site were low noise-generating activities (i.e. truck manoeuvring and maintenance works only).

As noted in Section 11.2.1, the land uses immediately surrounding the Proposal site are industrial. The nearest residential receivers are located in the nearby suburbs of Yagoona, Greenacre, Lidcombe and Regents Park, as shown in Figure 11-1.

Based on the background noise monitoring carried out at Yagoona and Regents Park background ambient noise levels were identified for the surrounding areas. The existing ambient noise levels are presented in Table 11-12.

Table 11-12 Existing Ambient Noise Levels

Monitoring Location	Represented Receivers	Time of Day	Noise Levels (dBA)	
			RBL	L_{Aeq}
Yagoona	Yagoona, South of Boardman Street to Greenacre, North of Como Road	Day	38	58
		Evening	40	52
		Night	35	49
Regents Park	Regents Park, South of Amy Street to Lidcombe, South of Main Avenue	Day	39	58
		Evening	41	55
		Night	37	48

11.4 Construction impacts

The main activities and plant and equipment associated with the construction of the Proposal are described in Section 4.4. The typical sound power level (SWL) for each noise generating plant and equipment item are presented in Table 11-13. The table also indicates what phase of construction these tools would be utilised. The activity sound power is considered to represent the typical worst-case level in a given 15-minute period ($L_{Aeq,15min}$). This sound power level is unlikely to be sustained at such a level for the duration of the activity. As a result, many 15-minute periods would be at lower levels.

Table 11-13 Sound power levels for construction plant

Equipment	Equipment SWL (dBA)	Construction stage		
		Stage 1: Establishment of hardstand	Stage 2: Construction of MRF	Stage 3: Construction of ancillary facilities
Cherry pickers	105	✓	✓	
Mobile crane	113	✓		✓
Forklift	100	✓	✓	✓

Equipment	Equipment SWL (dBA)	Construction stage		
		Stage 1: Establishment of hardstand	Stage 2: Construction of MRF	Stage 3: Construction of ancillary facilities
Generators	103	✓	✓	✓
Hand-held tools	98	✓	✓	✓
Concrete agitators	109	✓		
Concrete saw	118	✓		
Overall Activity SWL (dBA)		**120**	**108**	**14**

The predicted $L_{Aeq,15min}$ construction noise levels at sensitive receivers are presented in Table 11-14. As shown, there is one exceedance of the NML by one dBA during Stage 1 at NCA 1. The predicted construction noise levels comply with the NML at all other receivers and no exceedances of the 75 dBA highly affected level are predicted. Stage 1 of construction would be carried out over a maximum of a four month period, minimising the extent and duration of any noise impacts.

Table 11-14 Predicted $L_{Aeq,15min}$ construction noise levels

Receiver	Predicted Noise Level (dBA)			NML	Exceedance
	Stage 1	Stage 2	Stage 3		
NCA1	49	38	43	48	1 dBA
NCA2	41	29	35	48	-
NCA3	43	31	36	48	-
NCA4	41	29	35	48	-
NCA5	39	27	33	48	-
NCA6	32	20	25	48	-
NCA7	33	22	27	48	-
NCA8	37	25	30	48	-
NCA9	41	30	35	48	-
NCA10	37	25	31	48	-
NCA11	36	24	30	48	-
NCA12	36	24	30	48	-
NCA13	32	20	26	48	-
NCA14	24	12	18	48	-
NCA15	23	11	16	48	-

Receiver	Predicted Noise Level (dBA)			NML	Exceedance
	Stage 1	Stage 2	Stage 3		
NCA16	34	22	27	49	-
NCA17	40	28	34	49	-
NCA18	38	27	32	49	-
I1	70	58	64	75	-
I2	63	51	57	75	-
I3	62	51	56	75	-
I4	69	58	63	75	-
I5	68	56	62	75	-
I6	69	57	63	75	-

No vibration intensive plant is expected to be used during the construction of the Proposal. vibration impacts would therefore be negligible.

11.5 Operation impacts

11.5.1 Operational noise impact assessment

The major operational noise sources associated with the Proposal include the various material handling and processing activities occurring within the MRF building, as well as trucks delivering materials to the Proposal site and collecting processed products.

Internal noise levels in different areas within the MRF building would be dictated by the activities occurring within those spaces. These maximum internal noise levels are summarised in Table 11-15.

Table 11-15 Internal noise levels

Building Area	Internal Noise Level
Receival Area	75 dBA
Processing Area	85 dBA
Product Storage Area	75 dBA

The predicted $L_{Aeq,15min}$ noise levels at sensitive receivers associated with the Proposal were assessed for both calm and noise enhancing (NE) meteorological conditions and are presented in Table 11-16. The predicted operational noise levels comply with the established project noise trigger levels at all nearby receivers for all assessment periods.

Table 11-16 Predicted $L_{Aeq,15min}$ operational noise levels

Receiver	Predicted $L_{Aeq, 15min}$ Noise Level (dBA)				Project Noise Trigger Level ($L_{Aeq,15min}$ dBA)			Compliance status
	Day/Evening		Day		Day	Evening	Night	
	Calm	NE	Calm	NE				
NCA1	34	39	34	38	43	43	40	Compliant
NCA2	28	34	28	33	43	43	40	Compliant
NCA3	28	33	28	32	43	43	40	Compliant
NCA4	26	31	26	31	43	43	40	Compliant
NCA5	25	30	25	30	43	43	40	Compliant
NCA6	<20	23	<20	23	43	43	40	Compliant
NCA7	20	25	20	25	43	43	40	Compliant
NCA8	23	29	23	28	43	43	40	Compliant
NCA9	28	33	28	32	43	43	40	Compliant
NCA10	24	29	24	28	43	43	40	Compliant
NCA11	24	29	24	28	43	43	40	Compliant
NCA12	24	29	24	28	43	43	40	Compliant
NCA13	<20	24	<20	23	43	43	40	Compliant
NCA14	<20	<20	<20	<20	43	43	40	Compliant
NCA15	<20	<20	<20	<20	43	43	40	Compliant
NCA16	21	26	21	26	44	44	42	Compliant
NCA17	28	33	28	32	44	44	42	Compliant
NCA18	25	30	25	30	44	44	42	Compliant
I1	61	61	61	61	68	68	68	Compliant
I2	53	55	53	54	68	68	68	Compliant
I3	52	54	52	54	68	68	68	Compliant

Receiver	Predicted $L_{Aeq, 15min}$ Noise Level (dBA)				Project Noise Trigger Level ($L_{Aeq,15min}$ dBA)			Compliance status
	Day/Evening		Day		Day	Evening	Night	
	Calm	NE	Calm	NE				
I4	59	59	59	59	68	68	68	Compliant
I5	54	55	54	55	68	68	68	Compliant
I6	45	49	45	48	68	68	68	Compliant

Notes:

Day = 7.00 am – 6.00 pm; Evening = 6:00 pm – 10:00 pm; Night = 10:00 pm – 7:00 am

Calm = D-class stability, no wind

NE = 3 m/s source to receiver wind during day & evening; F-class stability during night.

11.5.2 Sleep disturbance assessment

During operations, truck pneumatic parking brakes are considered the most likely source of maximum noise levels. The typical L_{Amax} sound power level of pneumatic parking brakes is up to 122 dBA.

The predicted L_{Amax} noise levels at sensitive receivers due to the operation of truck parking brakes on the Proposal site was assessed and provided in Table 11-17. As shown, the predicted operational noise levels of truck parking brakes comply with the maximum noise trigger level at all receivers. As the predicted night-time $L_{Aeq,15min}$ operational noise levels are below 40 dBA at all residential receivers, the Proposal is unlikely to cause sleep disturbance impacts.

Table 11-17 Predicted L_{Amax} noise levels

Receiver	Predicted Level		Maximum Noise Trigger Level	Compliance status
	Calm	NE		
NCA1	45	48	52	Compliant
NCA2	40	43	52	Compliant
NCA3	39	43	52	Compliant
NCA4	37	40	52	Compliant
NCA5	37	40	52	Compliant
NCA6	29	33	52	Compliant
NCA7	32	35	52	Compliant
NCA8	36	39	52	Compliant
NCA9	39	42	52	Compliant
NCA10	35	38	52	Compliant
NCA11	32	36	52	Compliant

Receiver	Predicted Level		Maximum Noise Trigger Level	Compliance status
	Calm	NE		
NCA12	33	37	52	Compliant
NCA13	28	32	52	Compliant
NCA14	18	22	52	Compliant
NCA15	16	20	52	Compliant
NCA16	30	33	52	Compliant
NCA17	41	44	52	Compliant
NCA18	37	41	52	Compliant

Calm = D-class stability

NE = F-class stability

11.5.3 Road noise impact assessment

Given that the Proposal would generate more traffic movements during operations than during construction, the road noise assessment has considered the operational phase of the Proposal to be representative of the worst-case scenario.

It is anticipated that the Proposal would generate additional traffic near residential receivers on Rookwood Road and the Hume Highway compared to the current conditions. However, it is noted that that previous Chullora RRC would have operated with higher traffic volumes than proposed under the current Proposal.

Traffic volume and percent heavy vehicles

During peak operation, the Proposal would generate up to 264 two-way vehicle trips per day with 170 of these movements occurring during the daytime period. To assess a worst-case scenario, it has been conservatively assumed that 100 per cent of the heavy vehicle traffic generated by the Proposal travels along Rookwood Road and the Hume Highway.

Table 11-18 summarises the existing traffic conditions and predicted future traffic volumes associated with the peak operation of the Proposal along Rookwood Road and the Hume Highway. As described in Section 7.2.3, existing traffic flows along Rookwood Road and the Hume Highway were determined by a traffic count survey conducted on 4th -11th December 2019.

Table 11-18 Traffic volume and mix

Road	Time	Existing	Percentage heavy vehicles (mix)	Future (Proposal) Volume	Percentage heavy vehicles (mix)
		Volume		Volume	
Rookwood Road	Day	41,108	18%	41,278	19%
	Night	9,008	19%	9,102	19%
Hume Highway	Day	45,034	17%	45,204	17.%
	Night	11,761	18%	11,855	19%

Using the data traffic volume data presented in Table 11-18, road noise levels at the most affected receivers along Rockwood Road and the Hume Highway have been predicted for the existing traffic conditions and peak operation scenario. The predicted road noise levels are shown in Table 11-19.

Table 11-19 Predicted $L_{Aeq, period}$ road noise levels

Road	Existing		Proposal		RNP Criteria		Difference	
	Day	Night	Day	Night	Day	Night	Day	Night
Rookwood Road	72.2	67.9	72.3	68.0	60	55	0.1	0.1
Hume Highway	73.0	69.6	73.1	69.7	60	55	0.0	0.1

As shown in Table 11-19, the predicted road noise levels at the most affected receivers exceed the RNP impact assessment criteria for both the existing and peak operation scenarios. However, the predicted increase in road noise levels due to the operation of the Proposal is only 0.1 dBA above the existing conditions. As this is below the 2 dBA increase threshold outlined within the RNP, the road noise impacts associated with the operation of the Proposal are considered negligible.

11.6 Mitigation measures

Noise impacts generated by the Proposal during construction and operation would be minor and negligible, respectively. Table 11-18 outlines the mitigation measures that will be implemented by SUEZ to further minimise any noise and vibration impacts.

Table 11-20 Mitigation measures (noise and vibration)

ID	Mitigation measures	Timing
NV1	A CEMP, or equivalent, will be prepared for the Proposal to minimise noise and vibration impacts and will include the following: • Consideration of the selection of plant and processes with reduced noise emissions • A complaint handling process • Induction and training procedures for construction staff. An induction will be provided to relevant staff and sub-contractors outlining their responsibilities with regard to noise • Procedures for approval of any works undertaken outside of standard hours.	Construction
NV2	An OEMP, or equivalent, will be prepared for the Proposal to address noise and vibration impacts. Where appropriate, mitigation measures to minimise the unnecessary generation of noise during operation will be reviewed and considered for incorporation into the OEMP.	Operation

Conclusion

Wilkinson Murray have undertaken an assessment of the noise and vibration impacts associated with the Proposal. The assessment found that the noise impacts during the construction and operation of the Proposal are compliant with the applicable standards and criteria at all sensitive receivers with the exception of a minor (one dBA) temporary exceedance at one NCA during one stage of construction. There are no anticipated vibration impacts associated with the Proposal.

Despite no significant noise related impacts being identified, a range of management and mitigation measures will be incorporated into the CEMP and OEMP to minimise the unnecessary generation of noise during construction and operation.

12 HAZARDS AND RISK

Summary

A hazard and risk screening analysis has been undertaken to identify potential hazards and risks during construction and operation of the Proposal. The risk screening determined that, while chemicals and potentially dangerous goods would be stored within the Proposal site, quantities would not be substantial enough to trigger the requirement for a preliminary hazard analysis (PHA).

As the Proposal would be constructed on a prepared earthworks foundation, raised above the 1-in-100 flood event level, and would involve minimal disturbance to soils and no interaction with groundwater, there are minimal existing hazards to consider.

Potential hazards to the environment and / or public health through construction and operation of the Proposal include spills, fire and explosion, health and respiratory impacts, vehicle movements, and receipt of non-conforming waste that may contain contaminated or asbestos-containing material.

An operational risk assessment was undertaken to identify the measures that will be implemented to minimise hazards and risks during construction and operation, including engineering and administrative controls. The key mitigation measures that will be implemented include the preparation of a CEMP incorporating the standards of the *Work Health and Safety Act 2011 (WHS* Act), and the preparation of an OEMP including a PIRMP which will outline emergency response and incident management strategies, safety equipment to be maintained and provided, and operational protocols.

12.1 Introduction

This section includes an assessment of the hazards and risks associated with the Proposal to address the SEARs issued by DPIE. A preliminary risk screening has been prepared in accordance with the requirements of SEPP 33 and is included below (refer Section 5.4.3. Table 12-1 provides a summary of the relevant SEARs which relate to hazards and risks, and where they have been addressed in this EIS.

Table 12-1 SEARs (hazards and risks)

SEARs	Where addressed
Hazards	
A preliminary risk screening completed in accordance with *State Environmental Planning Policy No. 33 – Hazardous and Offensive Development* and Applying SEPP 33 (Department of Planning (DoP), 2011a), with a clear indication of class, quantity and location of all dangerous goods and hazardous materials associated with the development. Should preliminary screening indicate that the project is "potentially hazardous" a Preliminary Hazard Analysis (PHA) must be prepared in accordance with Hazardous Industry Planning Advisory Paper No. 6 - Guidelines for Hazard Analysis (DoP, 2011b) and Multi-Level Risk Assessment (DoP, 2011c)	Section 12.5

Further to the above, TfNSW and Council require further details on specific requirements relating to their authority. These requirements are discussed throughout this EIS and are provided in Table 12-2.

Table 12-2 Other agency requirements and relevant report sections (hazards and risks)

Aspect	Where addressed
TfNSW	
TfNSW requires an assessment of the likely toxicity levels of loads transported on arterial and local roads to / from the site and, consequently, the preparation of an incident management strategy for crashes involving such loads, if relevant.	Not Applicable. The Proposal would only be transporting dry recyclable waste to and from site and thus would not be transporting any materials classified as dangerous or toxic under the ADG Code (NTC, 2018).
Council	
Due to the nature of the proposal, it is requested that fire safety management measures form part of the future EIS. A detailed fire report by a suitably qualified consultant is recommended to demonstrate that the relevant fire safety requirements are implemented during the design and ongoing management of the facility, including information on emergency evacuation and types of building materials to be used and the fire resistance of these materials.	Section 4.3.5 (fire safety management infrastructure) Section 12.6 (fire safety management) Appendix G (Fire Safety Strategy) Appendix H (Fire Systems Design)

12.2 Methodology

A hazard is identified as anything or any situation with a potential for causing damage to people, property or the biophysical environment (DoP, 2011b). Hazard identification was undertaken based on a review of the existing and proposed features of the Proposal site. In identifying hazards and risks, operational and organisational safeguards designed to prevent or mitigate the effects of hazardous incidents have also been taken into consideration.

12.2.1 Desktop review

A desktop review and investigation of background information relevant to the Proposal was undertaken to identify the existing and future site conditions that may present hazards during construction and operation of the Proposal. This included an examination of existing contamination reports (as summarised in Section 10.2.2), aerial imagery (refer Appendix M) and site investigation data relevant to the Proposal site and surrounds.

The desktop review and investigation of relevant background information was used to effectively apply the risk screening method prescribed in SEPP 33. This included collecting the following information:

- Details and quantities of all dangerous goods and otherwise hazardous materials involved in the proposed development - including raw materials, intermediates, and products
- Dangerous goods classifications (including all subsidiary classes) for all dangerous goods held on site
- Distance from the boundary for each hazardous substance (if applicable)
- Weekly and annual number of deliveries (and the quantities) of dangerous goods and otherwise hazardous materials to and from the facility
- A locality plan showing the nearest sensitive receiver.

12.2.2 Preliminary risk screening

As discussed in Section 5.4.3, SEPP 33 links the permissibility of an industrial development to its safety and environmental performance. Activities involving the handling, storage or processing of a range of materials, which, in the absence of controls may create risk outside the operational borders to people, property or the environment are defined by SEPP 33 as a 'potentially hazardous industry' and / or 'potentially offensive industry'. Under clause 12 of SEPP 33, industries or projects determined to be potentially hazardous require the preparation of a PHA.

To determine if the Proposal is defined as a potentially hazardous industry and / or potentially offensive industry under the provisions of SEPP 33, a preliminary risk screening was undertaken in accordance with Figure 4 of *Applying SEPP 33: Hazardous and Offensive Development Application Guidelines* (Applying SEPP 33) *(*DoP, 2011a*).* This involved:

- Identification of dangerous goods involved in the Proposal, the quantities of these goods and the distance of the storage location relative to the site boundary
- Determination of whether the Proposal would emit a polluting discharge which would cause a significant level of offense, and hence require a licence.

12.2.3 Surrounding land use

Neighbouring land uses identified in Section 2.5 and include the PFD Storage Warehouse immediately to the north. As part of the DA prepared for the PFD warehouse (DA-37/2017) it was identified that dangerous goods would be stored on site. The Statement of Environmental Effects (Willowtree Planning, 2017) prepared for the development included an assessment of the Proposal against SEPP33 to determine if the facility was hazardous or offensive (summarised in Table 12-3), concluding that it was not.

Table 12-3 PFD Storage Warehouse dangerous good classes and maximum quantities stored (Willowtree Planning, 2017)

Class	Description	PG	Quantity	SEPP 33 Threshold
2.1	Aerosols	-	<9,000 kg (LPG)	10 t
	Cylinders	-	<500 kg (LPG)	
2.3 (8)	Anhydrous Ammonia	-	1.5 t	5 t
8	Corrosives	III	<11,500 kg (including 10,000 kg batteries and 1,500 kg ammonia)	50 t

12.3 Existing environment

12.3.1 Proximity of the Proposal site to sensitive receivers

The location of sensitive receivers in the vicinity of the Proposal site are described in detail in Section 2.5 and shown in Figure 2-4. As the Proposal is located within the Chullora Technology Park, most of the surrounding land uses are of an industrial nature, and include:

- PFD Storage Warehouse to the immediate north
- BlueScope Steel warehouse to the immediate south

- Veolia Greenacre Transfer Station to the south-east and the Tip Top Bakery to the east
- BP fuel station and Galintel Steel and Nepean Building & Infrastructure to the immediate west.

The closest residential receivers are located approximately 455 m to south-west of the Proposal site in the suburb of Yagoona.

12.3.2 Existing hazards present on the Proposal site

The Proposal would be constructed on an existing levelled earthwork platform above the 1-in-100 year flood event and would not involve any earthworks, major excavations or clearing of vegetation. In the incredibly unlikely event that a PMF flood event occurs the Proposal site may become inundated representing a possible hazard.

No dangerous goods such as oils, grease, cleaning chemicals, paints and lubricants would be present on the Proposal site.

Previous soil and contamination assessments undertaken in 1996, 2016, 2018 and 2019 have indicated that elevated concentrations of contaminants are present in several isolated locations in soil, groundwater and Cooks River sediments across the Chullora RRP site (refer Chapter 10). However, none of these contaminants were identified within the Proposal site boundary and a number of the identified locations have been (or will be as part of the flood mitigation works (DA 366/2020)) subsequently excavated or capped.

12.4 Construction impacts

Potential hazards to the environment and / or public health identified in relation to the construction of the Proposal are discussed below. Table 12-5 outlines these hazards including the associated risk, proposed mitigation strategy and relevant standard or guidance document that would be used in the development of the procedure or engineered control.

12.4.1 Dangerous goods and hazardous material

During construction, small volumes of fuels and chemicals would be stored on the Proposal site for use by machinery and equipment. There is potential for these substances to spill into the surrounding environment during refuelling activities, transport and delivery if not managed appropriately. Any fuels and chemicals would be appropriately stored during construction. Section 12.6 outlines measures that will be employed during construction to minimise the risk from handling and storing potentially dangerous goods.

12.4.2 Potential hazards

Asbestos

If not removed properly asbestos may have the potential to pose a risk to human health. When asbestos is disturbed, it forms a dust of minute fibres that can easily be inhaled. Asbestos-related diseases, such as lung cancer, are caused by the inhalation or ingestion of these particles of asbestos. Given that no buildings would be demolished as part of the Proposal, it is unlikely that any asbestos-containing material would be uncovered during the construction of the Proposal.

Asbestos would only be encountered if traces were present within imported fill material used to construct the earthworks platform across the Chullora RRP prior to the commencement of construction of the Proposal. However, this is considered highly unlikely; and any asbestos related impacts to human health would be minimal.

If identified, the excavation, movement and disposal of ACM within soil would be undertaken in strict accordance with procedures detailed in the *Work Health and Safety* (*WHS) Regulation 2011*.

Contaminated land

A Site Auditor has deemed the Chullora RRP site suitable for commercial / industrial use (refer Chapter 10). Due to the lack of contamination present on the Proposal site and the existing prepared earthworks platform, it is unlikely that contaminated land poses a hazard or risk. Mitigation measures for contaminated material found during construction are presented in Section 10.6.

Flooding

The Proposal site is above the 1-in-100 year flood event. However, the Proposal site is within the PMF flood zone. The north-western portion of the Proposal site is raised above the PMF extent and could be readily accessed on foot by any construction workers in the highly unlikely event a PMF event occurs. Egress from the Proposal site is available via Muir Road and Rookwood Road to the north during a flood event.

12.5 Operation impacts

12.5.1 Dangerous goods storage

As described in Applying SEPP 33 and in Section 12.2, the first stage of determining the SEPP 33 procedural requirements for the Proposal, and in particular to determine if a PHA is required, is to undertake screening tests, including dangerous good quantity/distance thresholds. Hazardous materials are defined as substances which fall within the classification of the ADG Code (NTC, 2018).

The main sources of hazardous materials at the Proposal site include:

- **Non-conforming waste:** dangerous and / or hazardous goods that may be mixed in the waste stream and transported to site
- **Hazardous materials used on-site**: dangerous goods used for the operation of the Proposal, as well as any polluting discharge that the Proposal may emit. It is likely that chemicals associated with operations, plant and vehicle maintenance would be stored and used on-site.

The dangerous goods likely to be used onsite, and the estimated quantities, are presented in Table 12-4.

Table 12-4 Quantities of dangerous goods assessed against screening thresholds

Chemical/ material	Use	Maximum quantity to be stored onsite (estimated)	Dangerous Goods Class	Storage location and distance from boundary	Threshold
Diesel fuel	Equipment and machinery refuelling	60,000 L	C1 Combustible liquids	Mobile fuel tank	Placard requirement for 10,000 L if in the presence of other Class 3 dangerous goods
Oils and greases	Equipment and machinery	5,000 L	C2 Combustible liquids	Housed within 240 L drums located within the workshop area within the MRF	Not classified as dangerous goods under A*pplying SEPP 33*
LPG	Equipment and machinery	<10 t	Flammable gas	Waste LPG gas canisters would be stored within the	10 t

Chemical/ material	Use	Maximum quantity to be stored onsite (estimated)	Dangerous Goods Class	Storage location and distance from boundary	Threshold
				workshop area within the MRF. Quantities would be kept below the threshold limit	

The volume of dangerous goods proposed to be stored onsite are well below the screening thresholds for their quantities that would trigger the requirement for a PHA. A minimal number of LPG cannisters (below 10 t) would be stored onsite within cages in the workshop area. Waste LPG gas bottles would be stored in cages (up to three to four at any given time). The LPG storage location will be provided in accordance with *Australian Standard 4332-1995: The storage and handling of gases in cylinders*.

As a C1-Combustible liquid the 60 KL of diesel fuel is not considered to be a dangerous good when stored in a separate bund where there are no other flammable materials stored in accordance with *Applying SEPP 33.* A self-bunded diesel tank compliant with *Australian Standard 1940-2004: The storage and handling of flammable and combustible liquids* would be used for the storage of the diesel.

A range of other cleaning product, paint and solvents would be stored on site. All products would be appropriately stored and labelled.

Based on the type and quantities of goods to be stored on site the risk screening concluded that a PHA is not required for the Proposal.

12.5.2 Potential hazards

Operational hazards associated with the Proposal have been identified based on a review of the proposed operational activities, and considering the hazards associated with each of the dangerous goods proposed to be stored within the Proposal site. Potential hazards and risks associated with the operation of the Proposal have been identified, including:

Spills

This includes liquid, gas and solid spills and leaks. Depending on the material and circumstances, spills may result in damage to skin, membranes, airways and physical impact and injury (e.g. falling materials). Spills also have the potential to cause harm to the environment, particularly if liquid spills of toxic and / or hazardous substances enter waterways or groundwater and / or contaminate soil.

Spill kits will be installed within the MRF and a PIRMP will be prepared and included in the OEMP to mitigate risks and impacts in the event of a spill.

Fire or explosion

As described in Section 2.3, the former Chullora RRC, which included a MRF, was subject to a fire in 2017 that eventually led to the demolition of the RRC. This event, as well as recent fires at the Perth MRF and the Lismore Recycling & Recovery Centre in 2019, demonstrate the inherent fire risk in operating a resource recycling facility.

Fire and explosions have the potential to cause human injury and damage to property and equipment. Fire may be caused by a number of factors, including hot waste loads, electrical and chemical causes. There are three potential scenarios by which the Proposal site may be impacted by fire or explosion:

- Fire from adjacent sites, including fires from surrounding industrial uses or bushfires

- Fire from waste trucks entering the Proposal site caused by hot material brought in with waste, or possibly through spontaneous combustion of volatile material in the waste
- Fire or explosion initiated on site, e.g. from a vehicle accident, equipment, by discarded matches or naked flames, by spontaneous combustion of stockpiles or during operations through the baling of materials or the risk of explosion from aerosols.

A Fire Safety Strategy has been prepared for the Proposal (provided in Appendix G) and a broad range of fire management systems have been incorporated into the design of the MRF and broader Chullora RRP (refer Section 4.3.5 and Appendix H). The fire systems design has been prepared in consultation with FRNSW and in accordance with *Fire Safety Guideline: Fire Safety in Waste Facilities* (FRNSW, 2020). A review of the Proposal's alignment with the Fire Safety Guidelines is provided in Appendix G.

Health and respiratory impacts

Airborne emissions associated with the Proposal may impact the local environment within and surrounding the Proposal site and raise potential health concerns, such as asthma and allergies, in the local community. Potential emissions from the Proposal include:

- **Vehicle exhaust:** exhaust fumes consisting of lead, CO, hydrocarbons and NO_2 from increased traffic to and from the Proposal site
- **Dust:** resulting from bulk material handling and equipment / vehicle movements
- **Microbial:** including moulds, microbial spores and pollen within the waste.

The air quality impacts of the Proposal are presented in Section 8.5. The results of this assessment are summarised below:

- Results for the 24-hour maximum scenario indicate that concentrations of $PM_{2.5}$ and PM_{10} exceed the relevant criteria at every sensitive receptor. Notably, however, this exceedance is primarily attributed to the background concentrations of $PM_{2.5}$ and PM_{10} (refer Section 8.3.2), with the MRF contributing a marginal proportion of total concentrations and not leading to any additional days where background levels are exceeded
- Predicted TSP and dust deposition averages were found to comply with the relevant criteria
- The ground level concentrations of NO_2, SO_2, CO and VOCs were also found to comply with the relevant criteria.

The results from the odour assessment outlined in Section 8.5.3 demonstrate that the ground-level odour concentrations resulting from the Proposal are predicted to comply with the odour criteria at all sensitive receivers. Given this, odour impacts in this hazard assessment have not been considered.

Given the distance from the Proposal to the closest sensitive receivers, it is likely that impacts to health associated with the Proposal would be negligible.

Vehicle movements and machinery use

Heavy vehicles, light vehicles, and pedestrian (staff and public) movements on the Proposal site present potential hazards including:

- Incidents between vehicles
- Incidents between vehicles and pedestrians
- Incidents between vehicles and property.

Incidents involving vehicles may result in injury, loss of life or damage to property. A number of features and management measures have been incorporated into the design of the Proposal to minimise the potential for incidents between vehicles, machinery, pedestrians and property, including:

- All vehicles would travel in a forward direction (with the exception of vehicles reversing into the receival area). Incoming and outgoing vehicles would be separated by a raised median preventing

accidental cross over. Cross over and conflict points have been minimised throughout the Proposal site, optimising operational efficiency and reducing collision risk

- Sufficient area has been provided within the MRF for machinery to manoeuvre. All vehicles turning movement shave bene confirmed via swept path analysis (refer Appendix J) to ensure vehicles can safely travel through the Proposal site
- Personnel interaction with vehicles and machinery would be minimised. A series of elevated platforms would be provided within the MRF to limit the need for personnel to interact with machinery at ground level. Access would be provided directly from the car park into the mezzanine floor of the MRF site office, eliminating the need to personnel to traverse trafficked areas.

Non-conforming waste

Non-conforming waste brought on to the Proposal site via truck during operations may present a hazard, as it may contain contaminated material or ACM.

Non-conforming waste will be managed by the measures described in Section 4.5.5. In summary, any waste tipped on the reception floor that is determined to be non-conforming would be manually removed from the waste processing activities and be treated as residual / rejects waste stream. A bunker would be located under the sorting platform for non-conforming waste to be diverted to. Any non-conforming waste would be treated as residual waste, if appropriate, and collected for disposal at landfill on a daily basis. As a result, the hazards and risks associated with non-conforming waste are anticipated to be negligible.

Flooding

The Proposal site is above the 1-in-100 year flood event. However, the Proposal site is within the PMF flood zone. The north-western portion of the Proposal site is raised above the PMF extent and could be readily accessed on foot by any construction workers in the highly unlikely event a PMF event occurs. Egress from the Proposal site is available via Muir Road and Rookwood Road to the north during a flood event. An FERP will be prepared for the operation of the Proposal (refer Section 9.6).

12.5.3 Risk assessment

Based on a review of the key hazards, described above, Table 12-5 outlines the potential hazards identified as part of the risk assessment, the risk associated with the hazard and the proposed mitigation strategy that would be adopted to address the hazard, along with the relevant standard or guidance document that would be used in the development of the procedure or engineered control.

Hierarchy of controls

In identifying hazard mitigation and management measures the following hierarchy of controls (which range from most effective to least effective) were considered:

1. **Eliminate** the hazard altogether
2. **Substitute** the hazard with a safer alternative
3. **Isolate** the hazard from anyone who could be harmed
4. Use **engineering** controls to reduce the risk
5. Use **administrative** controls to reduce the risk
6. Use **personal protective equipment** (PPE).

This hierarchy starts with the most preferable approach to managing hazards. The hazard scenarios, mitigation measures and guidelines that would be implemented to minimise risks, along with the type of control that each mitigation measure or guideline represents, are presented in Table 12-5.

Table 12-5 Hazard scenarios and consequences associated with the Proposal

Potential hazard	Risk	Potential impact	Management standards and guidelines	Stage	Hierarchy of control
Light and heavy vehicle, and equipment movements surrounding the Proposal site	Vehicle accidents, including: • With private vehicles • With Proposal-related light and heavy vehicles • With pedestrians • With structures	• Physical harm • Property damage • Loss of operating time	Elevated walking platforms within the MRF processing shed to be used by all personnel (i.e. minimal personnel movements on the processing shed floor) Provision of a dedicate pedestrian overbridge linking the carpark directly into the MRF, eliminating the need for personnel to traverse trafficked areas.	Operation	Eliminate
			Separation, where practicable, of light and heavy vehicles and equipment (e.g. light vehicles have a separate access point as shown via Anzac Street. There would be no need for light vehicles to interact with heavy vehicles.	Operation	Eliminate
			All vehicles would travel in a forward direction (unless reversing into the receival area). Incoming and outgoing vehicles would be separated by a raised median preventing accidental cross over. Cross over and conflict points have been minimised throughout the Proposal site, optimising operational efficiency and reducing collision risk	Operation	Eliminate
			Heavy vehicle drivers and equipment operators trained, licenced and competent	Construction Operation	Administrative
			Clear signage and road markings (speed limits, directions, no access areas, marked parking bays)	Operation	Administrative
			Operational procedures outlined in the OEMP	Operation	Administrative
			OEMP prepared in accordance with *AS 3745 - 2010 Planning for emergencies in facilities*	Operation	Administrative

Potential hazard	Risk	Potential impact	Management standards and guidelines	Stage	Hierarchy of control
Trucks unloading unsecure or unstable loads	Falling objects, loss of control, vehicle accident, impacts on other vehicles, plant or staff	• Physical harm • Property damage	Elevated walking platforms within the MRF processing shed to be used by all personnel (i.e. minimal personnel movements on the processing shed floor)	Operation	Isolate
			Drivers and operators licenced and competent	Construction Operation	Administrative
			Operational procedures outlined in the OEMP	Operation	Administrative
			Personnel would be required to wear appropriate PPE at all times.	Construction Operation	PPE
			OEMP prepared in accordance with *AS 3745 - 2010 Planning for emergencies in facilities*	Operation	Administrative
Fires or explosion	Bushfire, fire initiated on-site or at adjacent sites, fire initiated from spontaneous combustion of waste stockpiles on-site, fire from waste trucks entering the Proposal site	• Physical harm • Property damage • Loss of operating time • Environmental fines	Fire safety design features including FRL 90 / 90 / 90 fire partitioning within the MRF processing shed, installation of an automated sprinkler system and an extensive range of fire suppression systems (Section 4.3.5)	Operation	Engineering
			Fire safety design features operated in accordance with *AS 1815: Maintenance of Fire Suppression System and Equipment*	Operation	Engineering
			Fire safety design features operated in accordance with *AS 1851-2012 Routine service of fire protection systems and equipment*	Operation	Engineering
			Operational procedures outlined in the OEMP	Operation	Administrative

Potential hazard	Risk	Potential impact	Management standards and guidelines	Stage	Hierarchy of control
			PIRMP and Emergency Response Plan to be included in OEMP and to include a Spill Management Procedure.	Operation	Administrative
Diesel fuel leak or fire due to vehicle collision or faulty storage	Fire or skin contact / inhalation	• Physical harm • Property damage • Loss of operating time	Fire safety design features including FRL 90 / 90 / 90 fire partitioning within the MRF processing shed, installation of an automated sprinkler system and an extensive range of fire suppression systems (Section 4.3.5)	Operation	Engineering
			Storage in a separate bund and within a storage area where no other flammable materials stored.	Construction Operation	Engineering
			Emergency Response Plan to be included in the PIRMP	Operation	Administrative
			Operational procedures outlined in the OEMP	Operation	Administrative
			Appropriate PPE supplied and worn	Construction Operation	PPE
	Release of dangerous goods	Environmental harm	Dangerous goods would be appropriately bunded	Construction	Engineering
			Water quality management infrastructure has been included within the design of the Proposal (refer to Section 4.3.7)	Construction Operation	Engineering
Non-conforming waste (e.g. paints, chemicals, asbestos, putrescible waste)	Spills, exposure to hazardous substances	Physical harm	Operational procedures outlined in the OEMP	Operation	Administrative
			Visual inspection of waste at the weighbridge by staff	Operation	Administrative
		Environmental harm including land contamination	Water quality management quality infrastructure has been included within the design of the Proposal (refer to Section 4.3.7)	Construction Operation	Engineering

Potential hazard	Risk	Potential impact	Management standards and guidelines	Stage	Hierarchy of control
Dust generated from operating equipment, vehicle movements and bulk material handling	Respiratory health impacts, eye and skin irritation	Physical harm	Enclosed areas where practicable, including enclosed working cabins	Operation	Engineering
			Sealed roads	Operation	Engineering
			Covered loads	Construction Operation	Administrative
			Eye protection and dust masks where required	Construction	PPE
Vehicle exhaust generated from movement of trucks and equipment	Respiratory health impacts, eye and skin irritation	Physical harm	Vehicle and equipment maintenance to reduce particulate discharge	Construction Operation	Administrative
			Where practicable, limit vehicle movements within enclosed areas	Operation	Administrative
Natural hazards (e.g. flooding and lightning)	Personal injury or potential fire	Physical harm and property damage	Buildings designed to appropriate standards	Operation	Engineering
			Site drainage and flood immunity above 1:100 ARI flood event	Construction Operation	Engineering
			Operational procedures outlined in the OEMP	Operation	Administrative
			A FERP will outline evacuation procedures	Construction Operation	Administrative

12.6 Mitigation measures

While a number of potential hazards and risks have been identified associated with the Proposal, a comprehensive range of management measures have been identified to minimise risk. A preliminary risk screening assessment did not identify the need for a PHA to be prepared for the Proposal. Table 12-6 outlines the mitigation measures that will be implemented by SUEZ to further minimise any hazard and risk impacts.

Table 12-6. Mitigation measures (hazards and risks)

ID	Mitigation measures	Timing
HR1	A CEMP, or equivalent, will be prepared for the Proposal to minimise hazards and risks and will include the following: • Health and safety requirements for construction. Construction works, including the storage, handling and use of hazardous construction materials will be undertaken in accordance with the provisions of the *Work Health and Safety Act 2011* and *Work Health and Safety Regulation 2011.* • Operational access and egress points for emergency service personnel and workers.	Construction
HR2	A PIRMP and Emergency Response Plan will be prepared for the Proposal to outline the procedure to be followed in the event of an incident or emergency during construction and operation. The PIRMP will be developed collaboratively with the construction contractor and site operator and in consultation with the NSW Police force, NSW Fire Brigade and the Ambulance Service of NSW. Emergency response and incident management protocols will cover the following types of emergency or incident: • Workplace health and safety • On-site spills or leaks • Off-site discharges • Hazardous materials / dangerous goods • Flooding • Road incidents, including incidents involving the transport of dangerous or toxic goods • Fire The PIRMP will include: • Training and induction protocols. Induction will be provided to all staff and subcontractors outlining their responsibilities in the event of an emergency or incident • Incident response in the case of a fire, including: – Measures to prevent fires on site and for the management of hot loads (fires occurring in transfer vehicles) – Treatment of fires as an emergency. The extinguishment of fires will take precedence over normal operations – Protocols for the containment and disposal of fire water – Maintenance requirements for firefighting equipment. All firefighting equipment will be regularly maintained in accordance with the equipment maintenance specification. Equipment will be replaced as necessary	Construction and operation

ID	Mitigation measures	Timing
	• Notification requirements and timeframes to applicable authorities in the event of an emergency or incident • Non-confirming waste protocols • The location and content of a spill kit. A spill kit will be present on site at all times Review regimes of the PIRMP. Regular reviews and updates will be made for the PIRMP as required.	
WH4	A Flood Emergency Response Plan (FERP) will be developed for operational phase of the Proposal. The FERP would take into consideration, site flooding and broader flood emergency response plans for the Upper Cooks River catchment. The FERP would also include the following: • Identification of an area of safe refuge within the Proposal site that would allow people to wait until hazardous flows have receded and safe evacuation is possible • Identification of a flood warden and other responsible persons • Procedures for warning staff of potential flood danger. The FERP will be completed in conjunction with Council and NSW State Emergency Service (SES).	Operation

Conclusion

A hazard and risk screening analysis was undertaken to identify potential hazards and risks during construction and operation of the Proposal.

Construction and operation of the Proposal would require the storage of chemicals, fuels and potentially dangerous goods, including diesel fuel. The volume of dangerous goods proposed to be stored onsite are, where prescribed, is well below the screening thresholds for their quantities that would trigger the requirement for a PHA.

Potential construction and operational hazards include spills, risk of fire and explosion, health and respiratory impacts, vehicle movements and machinery use, floods and receipt of non-conforming waste. These would be managed through the implementation of operational mitigation measures to minimise hazards and risks, including engineering and administrative controls. The key mitigation measures that will be implemented include the preparation of a CEMP incorporating the standards of the *WHS Act 2011*, and the preparation of an OEMP including a PIRMP which outlines emergency response and incident management strategies, safety equipment to be maintained and provided, and operational protocols.

PART C

ASSESSMENT OF OTHER ISSUES



13 SOCIO-ECONOMIC

Summary

Element Environmental have undertaken a Social Impact Assessment (SIA), provided in Appendix O, to address the SEARs as they relate to social impacts associated with the Proposal.

The SIA was prepared in accordance with the comprehensive requirements of the *Social Impact Assessment Guideline* (the SIA Guideline) (DPIE, 2017). The methodology for the assessment included:

- Scoping
- Social baseline analysis
- Impact assessment
- Mitigation.

The SIA Guideline identifies nine potential forms of social impact. Two of these categories were found to be applicable to the Proposal. Within these two categories, six 'social impact matters' were identified as being potentially impacted by the Proposal. The Proposal was assessed against each of these matters using a range of assessment methods selected during the scoping process.

The social baseline analysis found that the population of Chullora is no more or less susceptible to types of social impacts that may be generated by the Proposal and that the Proposal is well-suited to the existing Chullora area in terms of its scale and industrial nature.

Due to the limited duration and intensity of construction only two of the six social impact matters were assessed for the construction of the Proposal. Both potential impacts; road traffic delays and acoustic amenity disturbance; were assessed to be immaterial.

All six social impact matters were assessed for operation with two considered positive and four considered negative impacts. The potential positive impacts; built environment improvement (visual amenity) and community services improvement (advanced recycling capability for the community) were assessed to be of a moderate and high positive impact, respectively. All potential negative impacts: road traffic delays, acoustic amenity disturbance, air quality and odour disturbance and community safety (MRF fire risk) were assessed to be immaterial.

Measures for reducing other environmental aspects (e.g. traffic disturbance, fire risks noise and air quality impacts) and other social impacts will be incorporated into the CEMP and OEMP which will also reduce any associated social impacts.

13.1 Introduction

Element Environmental (Element) have undertaken an assessment of the potential social impacts associated with the Proposal to address the SEARs issued by the DPIE. The Social Impact Assessment (SIA) for the Proposal is provided in Appendix O. Table 13-1 provides a summary of the relevant SEARs, which relate to social impacts, and where these have been addressed in this EIS.

Table 13-1 SEARs (socio-economic)

SEARs	Where addressed
Social impacts	
Including a social impact assessment undertaken by a suitably qualified and experiences persons	Chapter 13 Appendix O SIA

13.2 Methodology

The SIA was prepared in accordance with the *Social Impact Assessment Guideline* (the SIA Guideline) (DPIE, 2017), which outlines the mandatory requirements for SIA in NSW and informed the methodology for this assessment.

The methodology for the assessment included four steps:

1. **Step 1** Scoping
2. **Step 2** Social baseline analysis
3. **Step 3** Impact assessment.
4. **Step 4** Identification of mitigation measures

13.2.1 Scoping

The scoping phase aimed to identify the aspects of the social environment (social impact matters) that are likely to be impacted by the Proposal and the selection of appropriate methods to assess these impacts. The scoping phase was developed using the following methods:

- Completion of literature review
- A scoping meeting with SUEZ
- Consultation with Council
- Completion of the DPIE SIA Guideline Scoping Tool
- Completion of stakeholder identification and analysis
- Identification of the area of social influence (ASI) development.

Key stakeholders

A CSPS has been prepared for the Proposal and is provided in Appendix I (refer Chapter 6). Stakeholders were identified from project meetings, existing consultation and a desktop review. Engagement techniques were then developed for each stakeholder group to establish and foster dialogue for the Proposal. The key stakeholders for the Proposal and associated engagement techniques are identified in Table 13-2 below.

Table 13-2 Key Proposal stakeholders

Stakeholder groups	Project stakeholder		Engagement techniques
Government (state and local)	• DPIE • Council • EPA	• Sydney Water • TfNSW • FRNSW	• Website • Letter correspondence • Provision of draft material • Meetings
Nearby neighbours	• PFD Food Services • Tip Top Bakeries • Western Containers • McWilliams Wines • Veolia Recycling Centre • BlueScope Steel • My Car	• Pacific National • Volvo Bus Australia • Aramex Sydney Chullora Business Park • News Limited • TAFE NSW Chullora • Primo Foods Head Office	• Letter • Flyer • Website • Direct consultation

Stakeholder groups	Project stakeholder		Engagement techniques
	• Nepean Building and Infrastructure • Pickles Chullora • Encompass Business Park • Alpha Precast • UD Trucks	• EWE Group • Australia Post Sydney Parcels Bulk Logistics • Volkswagen Group Australia Head Office • RSPCA • Swiss Deli	

Area of social influence

An ASI is the geographical social footprint of a project which is not exclusively contained in a project boundary. The ASI for the Proposal is the suburb of Chullora and is shown in Figure 13-1. Unlike some of its neighbouring suburbs (e.g. Greenacre) which contain a large volume of residential properties, Chullora is predominantly comprised of industrial and manufacturing properties. The suburb is characterised by “transport, postal and warehousing, and food product manufacturing” with a focus on interstate freight rail transport (Greater Sydney Commission, 2018b).

Social impact assessment scoping tool

The SIA Guideline identifies nine potential forms of social impact. Through the completion of the steps above, the Scoping phase identified which of these impacts would be potentially impacted by the Proposal and therefore should be assessed as part of the SIA. Table 13-3 outlines the results of the scoping process and identifies the social impact matters that were determined as required to be assessed within the SIA.

The scoping phase also identified the methods by which each impact should be assessed in accordance with the SIA Guideline. The methods identified as appropriate for use in the SIA comprised:

- **Media analysis:** A review of articles written between January 2018 and March 2020 from the local newspaper, the *Canterbury Bankstown Express,* was undertaken. Any article which mentioned or suggested an association to the target social impact matter was analysed for its relevance to the Proposal
- **Desktop research:** Reviews of relevant primary and secondary research, qualitative and quantitative data, and appropriate engagement with potentially affected people, to establish a baseline and support predictions
- **Online survey:** A survey was designed to investigate community well-being in the Chullora area. The design involved a series of closed, multiple-choice questions, and one open question where respondents could openly express their opinion on the social matters chosen
- **Direct consultation via telephone:** Representatives of 24 of the Proposal’s neighbouring properties were contacted and provided with the opportunity to submit feedback about any aspect of the Proposal.

Table 13-3 Social impact categories relevant to Proposal

Social impact categories (as per Guideline)	Relevant to Proposal? (Y/N)	Social impact matter	Assessment method (as per Guideline)
Way of life	No	-	-
Community	No	-	-
Access to and use of infrastructure, services and facilities	Yes	Road and rail network	Media analysis
		Built environment (other built assets)	Desktop research
		Community (services and facilities)	Desktop research
Culture	No	-	-
Health and wellbeing	No	-	-
Surroundings	Yes	Amenity (acoustic)	Online survey
		Amenity (odour and air quality)	Online survey
		Community (safety)	Direct consultation via telephone
Personal and property rights	No	-	-
Decision-making systems	No	-	-
Fears and aspirations	No	-	-

13.2.2 Social baseline analysis

A social baseline analysis was completed, describing and analysing the existing socio-economic environment applicable to the Proposal to understand the potentially affected groups or communities. This was based on a desktop review, including review of:

- Census datasets (Australian Bureau of Statistics (ABS), 2018)
- Canterbury-Bankstown Community Strategy (Council, 2018)
- Spatial Services NSW Point of Interest web service (NSW Department of Finance, Services and Innovation, 2018).

13.2.3 Impact assessment

Each of the social impact categories listed in Table 13-3 were assessed in the context of the socio-economic features with the area of social influence for the Proposal. The assessment analysed potential changes and impact to existing socio-economic conditions during construction and operation and of the Proposal, including assessing a risk level. Table 13-4 outlines the social risk matrix developed to assess the relative social impact of the Proposal on the social environment. Analysis of social impacts considered the results of the environmental assessment completed as part of this EIS.

Table 13-4 Social risk matrix

		Consequence level				
		Minimal	**Minor**	**Moderate**	**Major**	**Catastrophic**
Likelihood level	**Almost certain**	High	High	Extreme	Extreme	Extreme
	Likely	Moderate	High	High	Extreme	Extreme
	Possible	Low	Moderate	High	Extreme	Extreme
	Unlikely	Low	Low	Moderate	High	High
	Rare	Low	Low	Moderate	High	High

13.2.4 Identification of mitigation

The final step included recommending mitigation measures to manage the potential negative social impacts and improve the positive benefits of the Proposal.

13.3 Existing environment

13.3.1 Social baseline

The social baseline is the nominated set of social indicators for communities that may be affected by the Proposal. The baseline provides a point of comparison that can be used as reference data against which to measure the impacts of the Proposal as it develops.

Regional context

Canterbury-Bankstown and the Chullora area are integral parts of Greater Sydney's industrial fabric and employment lands. Canterbury-Bankstown contains almost 58 per cent of the industrial and urban services land in the southern district of Greater Sydney. While in recent decades larger scale freight and logistics firms have re-located into the Western Sydney district, a significant freight and logistics presence remains in the Canterbury-Bankstown LGA due to the competitive advantages and efficiencies afforded by proximity to Villawood and Chullora freight intermodal terminals (Greater Sydney Commission, 2018b).

Within Greater Sydney's southern district, Chullora is the second largest industrial precinct after Kurnell. This indicates that the area is of importance to the regional economic and industrial landscape.

Local context

As outlined in Chapter 2, the Proposal site is located within an industrial precinct and therefore has characteristics typical of these areas including a relatively low residential population. Table 13-5 presents the relevant baseline data primarily derived from the 2016[1] Australian Census of Population and Housing (ABS, 2018). This data provides an overview of the social characteristics of the local area likely to be impacted by the Proposal.

[1] Note that these statistics are representative of the local context prior to the emergence of COVID-19. Due to the economic impact of COVID-19, it is likely that key statistics, such as employment and industry, are subject to change.

Table 13-5 Local socio-demographic context[2]

Social measure	Chullora description
Industry and employment	• The majority (65.7%) of the population worked full-time and 20.7% worked part-time • Unemployment in Chullora is considerably low (4.8 per cent) compared to the NSW and Australian averages (6.3% and 6.9%, respectively) • Banking, construction, IT services, building and other industrial cleaning services and clothing retail as being the most prominent industries of employment • Most employed people travelled to work using a car with the second most used method being train.
Income	Strong incomes present in Chullora compared to the equivalent figures for the NSW and Australian populations (e.g. individuals earn at least $115 more per week)
Education	Relative to the NSW average, Chullora has smaller proportions of students in preschool and primary school. This is reversed for secondary school data indicating that there are a larger proportion of older families (i.e. not younger families with young children) living in the area
Housing	• Property in Sydney is generally among the most expensive in Australia and this scenario is reflected by the median mortgage repayments in Chullora ($2,700/week) • About 20% of the Chullora population have housing repayments greater than or equal to 30% of household income indicates that housing stress is generally higher in the area.

13.3.2 Social infrastructure

Social infrastructure refers to the facilities and services that enhance the social capacity of communities and provides a reference point against which the social impacts of the Proposal can be measured. The following essential social infrastructure was identified within the vicinity of the Proposal:

- Parks, reserves and ovals
- Sport facilities
- Education institutions
- Transport infrastructure
- Mary Wade Correctional Centre
- Art and cultural facilities
- Health facilities
- Aged care facilities
- Liberty Hill Christian Centre.

The locations of all identified infrastructure are shown in Figure 13-1.

[2] The Chullora Statistical Area 2 (SA2) census geography was selected as the basis of the analysis because the scale represents a community that interacts socially and economically.



LEGEND

- Chullora RRP site boundary
- Proposal site
- Future stage
- Flood detention basin
- Established earthworks
- Existing car parking area
- Existing site office
- Area of social influence (ASI)

Facility type

- Community
- Education
- Recreation

ARCADIS AUSTRALIA PACIFIC PTY LTD
ABN 76 104 485 289
Level 16, 580 George St | Sydney NSW 2000
P: +61 (0) 2 8907 9000 | F: +61 (0) 2 8907 9001

Coordinate System: GDA 1994 MGA Zone 56
Date issued: August 4, 2020
Aerial imagery source: NSW LPI

1:15,000 at A4

ARCADIS

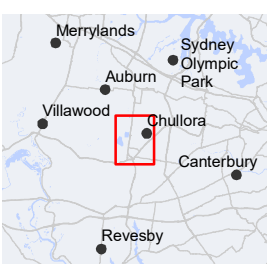


Figure 13-1: Social infrastructure within the vicinity of the Proposal site

13.3.3 Implications

The key implications from the findings of the existing socio-demographic and infrastructure profiles are identified below:

- The population is relatively advantaged, however there could be benefit in increasing the capacity of the local employment market to improve the unemployment rate. The Proposal would present an opportunity to employ people local to the area indicating that there are potential social benefits in terms of job opportunities
- The population is highly vehicle oriented. Disruptions to the road network could potentially impact those road users
- There are no community facilities that are directly adjacent to the Proposal and most are located within the suburbs of Greenacre and Lidcombe. This indicates that it is unlikely that the Proposal would directly impact the functioning of these facilities either temporarily or in the long-term.

Overall, the social profile indicates that the surrounding population is no more or less susceptible to social impacts of the Proposal and that the Proposal is well-suited to the existing Chullora area in terms of its scale and industrial nature.

13.4 Construction impacts

A range of engagement and SIA methods were used to collect and analyse information to predict the potential social impacts of the project. Results of the SIA analysis were considered according to the social impact categories defined in the SIA Guideline.

The overall social impact of construction is considered minor due to the short duration and limited intensity of the works required. Of the six social impact matters identified as applicable to the Proposal during the scoping process (refer to Table 13-3), only two were applicable to construction. Table 13-6 outlines the nature and social risk of these issues occurring for the Proposal during construction.

Table 13-6 Social impact assessment for construction

Social impact matter	Impact	Predicted social risk
Road and rail network	Cumulative social unease about traffic delays and network access issues	**Low** The TIA (refer to Appendix J) indicated that traffic generated during construction of the MRF would be minimal and would have a negligible impact on the surrounding road network. The industrial nature of the ASI and the TIA results indicate that the social impact is considered to be immaterial.
Amenity (acoustic)	Acoustic disturbance to nearby sensitive receivers	**Low** The NVIA (refer to Appendix N) predicted only one very minor noise exceedances of established noise management levels during construction (at only one receiver area for only one stage of construction). Mitigation measures will be employed during construction to further reduce the potential for exceedances. The online survey conducted for this portion of the SIA had no responses, despite all relevant stakeholders being invited to participate and provide feedback on any concerns relating to noise. Due to the lack of survey responses (and interpreted lack of interest) and NVIA results, the SIA predicts that acoustic amenity social impacts would be immaterial.

Social impact matter	Impact	Predicted social risk
Amenity (odour and air quality)	Odour and air quality disturbance to nearby sensitive receivers	**Low** The AQIA (refer to Appendix K) predicted negligible construction related odour and air quality impacts. The online survey conducted for this portion of the SIA had no responses, despite all relevant stakeholders being invited to participate. Due to the lack of survey responses (and interpreted lack of interest) and AQIA results, the SIA predicts that air quality amenity impacts would be immaterial.

13.5 Operation impacts

The potential social impacts from the operation of the Proposal are outlined in Table 13-7 below. The SIA indicated that there would be both positive and negative impacts.

Table 13-7 Social impact assessment for operation

Social impact matter	Impact	Predicted social risk
Built environment (other built assets)	Built environment improvement	**Moderate (positive)** Since the demolition of the previous Chullora RRP, the site has been used for truck parking, bin storage and maintenance activities. The MRF would provide an architecturally designed facility, with purpose-built and enclosed storage and unloading areas rather than the current ad-hoc arrangement on site. Social benefits of the improved visual amenity would be felt by both employees, customers and the passing general public.
Community (services and facilities)	Advanced recycling capability to mitigate regional recycling crisis and satisfy a society demanding waste industry reform	**High (positive)** As discussed in Chapter 3, the Proposal would represent a critical piece of waste infrastructure that would be required to facilitate the export ban on unrefined recycling streams, facilitate circular economy outcomes and build the resilience of the local recycling sector. SUEZ have also been the recipients of two grants under the Major Resource Recovery Infrastructure grant program indicating government support for the development of facilities such as the Proposal. This is considered to have a high social (positive) impact due to the publicity surrounding the recycling issues in NSW and the scale of benefit for the wider community.
Road and rail network	Cumulative social unease about traffic delays and network access issues	**Low** The TIA (refer to Appendix J) indicated that traffic generated during the operation of the MRF would be minor and found the existing road infrastructure has capacity to absorb such minor impacts to the road network. The TIA also noted that road upgrades or other road infrastructure works would not be required for the Proposal. The industrial nature of the ASI, and the TIA results indicate that the impact against this social impact matter is considered to be immaterial.

Social impact matter	Impact	Predicted social risk
Amenity (acoustic)	Acoustic disturbance to nearby sensitive receivers	**Low** The NVIA (refer to Appendix N) predicted no exceedances of established noise management levels during operation. Despite this, mitigation measures will be employed during operation to further reduce the potential for exceedances. The online survey conducted for this portion of the SIA had no responses, despite all relevant stakeholders being invited to participate. Due to the lack of survey responses (and interpreted lack of interest) and NVIA results, the SIA predicts that acoustic amenity impacts would be immaterial.
Amenity (odour and air quality)	Odour and air quality disturbance to nearby sensitive receivers	**Low** The AQIA (refer to Appendix K) predicted that there would be no odour impacts on sensitive receivers. The Proposal would not materially impact air quality in relation to dust, particulate matter or combustion gases. The online survey conducted for this portion of the SIA had no responses, despite all relevant stakeholders being invited to participate. Due to the lack of survey responses (and interpreted lack of interest) and AQIA results, the SIA predicts that air quality amenity impacts would be immaterial.
Community (safety)	Perceived safety risk held by the community in relation to fire at the MRF due to the fire at the previous Chullora RRC (see Section 2.3)	**Low** As detailed in Section 4.3.5 the MRF complies with the Building Codes of Australia (BCA) and Fire Design Guidelines (FRNSW, 2020). To further mitigate the fire risk, the MRF has a number of safety features, including: • Separation of waste stockpiles to the extent possible • Installation of fire-resistant walls between sections of the MRF • Sprinkler systems and fire suppression infrastructure • Fire-water containment system • Placement of hydrants and other fire systems. Of the 24 stakeholders contacted for direct consultation on this issue, only one provided a material response, stating that the Proposal raised no personal concerns regarding the safety of the Proposal. Given the inbuilt measures to mitigate fire risk and the lack of responses from relevant stakeholders, the communities perceived safety risk is considered immaterial.

13.6 Mitigation measures

Where appropriate, mitigation measures to minimise traffic network disturbances, fire risks and noise impacts will be reviewed and considered for incorporation into the CEMP.

In addition, a social monitoring framework will be incorporated into both the CEMP and OEMP to ensure that social issues are managed appropriately. This will include procedures for responding to complaints and engaging with stakeholders to resolve issues. Table 13-6 outlines the mitigation measures that will be implemented by SUEZ to further minimise any social impacts.

Table 13-8. Mitigation measures (Socio-economic)

ID	Mitigation measures	Timing
SE1	A CEMP and OEMP, or equivalent, will be prepared for the Proposal to minimise social impacts and will include the following: • A consultation strategy outlining measures to maintain communication with the community and all relevant stakeholders throughout construction and operation • A complaint handling procedure. A complaints register will be maintained to manage public complaints regarding odours, vermin, litter, dust and noise • Measures to respond to complaints and feedback received during the construction and operation of the Proposal.	Construction and operation

Conclusion

Element have prepared a SIA for the Proposal, accounting for both construction and operation. The assessment found that all negative social impacts are immaterial in nature. The two identified positive impacts: built environment improvement (visual amenity) and community services improvement (advanced recycling capability for the community) were considered to be of moderate and high significance.

Measures for reducing other environmental aspects (e.g. traffic disturbance, fire risks, noise and air quality impacts) and other social impacts will be incorporated into the CEMP and OEMP which will also reduce any associated social impacts.

14 BIODIVERSITY

Summary

Arcadis has undertaken an assessment of the biodiversity related impacts associated with the Proposal. This assessment included:

- Database searches for records of threatened entities as listed by the State and MNES as listed by the Commonwealth, within the Proposal site and surrounds
- Review of relevant literature to identify the existing environment of the Proposal site and provide an understanding of potential biodiversity values
- Field surveys to validate the existing environment and biodiversity values identified during desktop analysis and investigate for the presence of threatened species, threatened species habitat, threatened ecological communities and MNES.

The Proposal site has been extensively disturbed by human activity, including vegetation removal, removal or burial of soil and has been subject to the construction of buildings, railway lines, roads and land modification for water management and levelling. There is no existing vegetation with the Proposal site and a lack of ecological features. The Proposal site does not contain any existing wetlands and the Cooks River stormwater canal, which runs adjacent to the south-eastern boundary, has minimal biodiversity value due to its highly disturbed context. Currently, the Proposal site includes an established levelled earthworks pad and an existing formalised driveway for heavy vehicles.

No biodiversity values were identified within the Proposal site. One patch of the Threatened Ecological Community (TEC) *Cooks River / Castlereagh Ironbark Forest in the Sydney Basin Bioregion* was identified adjacent to the Proposal site in the north-western extent of the Chullora RRP. The design of the Proposal has avoided direct impact to this TEC and therefore there would be no direct impact from development or operation of the Proposal. Indirect impacts to this TEC would be negligible, if any occur, and will be managed through the implementation of mitigation actions mentioned below.

During the construction and operational phases of the Proposal, there is a possibility of low level indirect impacts to biodiversity. These include:

- Inadvertent impacts on adjacent habitat or vegetation
- Reduced viability of adjacent habitat due to edge effects
- Reduced viability of adjacent habitat due to noise, dust or light spill
- Transport of weeds and pathogens from the Proposal site to adjacent vegetation.

The following measures will be implemented to mitigate biodiversity impacts (specifically fauna) during construction and operation of the Proposal:

- Delineation of the Proposal site from the TEC in the north-western corner of the Chullora RRP with fencing to prevent inadvertent damage to the TEC from construction activities.
- Site inductions which include a briefing regarding the local fauna of the Proposal site and protocols to be undertaken if fauna are encountered
- Directional lighting to be used where lighting is required in construction areas.

14.1 Introduction

This section provides an assessment of the biodiversity impacts associated with the Proposal to address the SEARs issued by DPIE. A Biodiversity Development Assessment Report (BDAR) for the Proposal is provided in Appendix P. Table 14-1 provides a summary of the relevant SEARs which relate to biodiversity, and where these have been addressed in this EIS.

Table 14-1 SEARs (biodiversity)

SEARs	Where Addressed
Biodiversity	
Biodiversity - including an assessment of biodiversity impacts in accordance with the Biodiversity Assessment Method and documented in a Biodiversity Development Assessment Report (BDAR).	Appendix P BDAR An assessment of biodiversity within Proposal site has been undertaken. Chapter 14 provides an assessment of the biodiversity value of the Proposal site.

Further to the above, the EES and the Water and the NRAR Groups within the DPIE require further details on specific requirements relating to their authority. These requirements are discussed throughout the report as indicated in Table 14-2.

Table 14-2 Other agency requirements and relevant report sections (biodiversity)

Aspect	Where Addressed
DPIE Environment, Energy and Science Group	
4. Biodiversity impacts related to the proposed development are to be assessed in accordance with Section 7.9 of the Biodiversity Conservation Act 2017, the Biodiversity Assessment Method and documented in a Biodiversity Development Assessment Report (BDAR). The BDAR must include information in the form detailed in the Biodiversity Conservation Act 2016 (s6.12), Biodiversity Conservation Regulation 2017 (s6.8) and Biodiversity Assessment Method, including an assessment of the impacts of the proposal (including an assessment of impacts prescribed by the regulations).	Appendix P BDAR Section 14.4 and Section 14.5 identifies potential indirect impacts which could occur from the Proposal to biodiversity.
5. The BDAR must document the application of the avoid, minimise and offset framework including assessing all direct, indirect and prescribed impacts in accordance with the Biodiversity Assessment Method.	Appendix P BDAR Chapter 14 demonstrates how the design of the Proposal avoids direct impacts to biodiversity.
6. The BDAR must include details of the measures proposed to address the offset obligation as follows; • The total number and classes of biodiversity credits required to be retired for the Proposal; • The number and classes of like-for-like biodiversity credits proposed to be retired; • The number and classes of biodiversity credits proposed to be retired in accordance with the variation rules; • Any proposal to fund a biodiversity conservation action; • Any proposal to conduct ecological rehabilitation (if a mining project); • Any proposal to make a payment to the Biodiversity Conservation Fund.	Appendix P BDAR The Proposal would not require offsets for impacts to biodiversity.
If seeking approval to use the variation rules, the BDAR must contain details of the reasonable steps	Appendix P BDAR

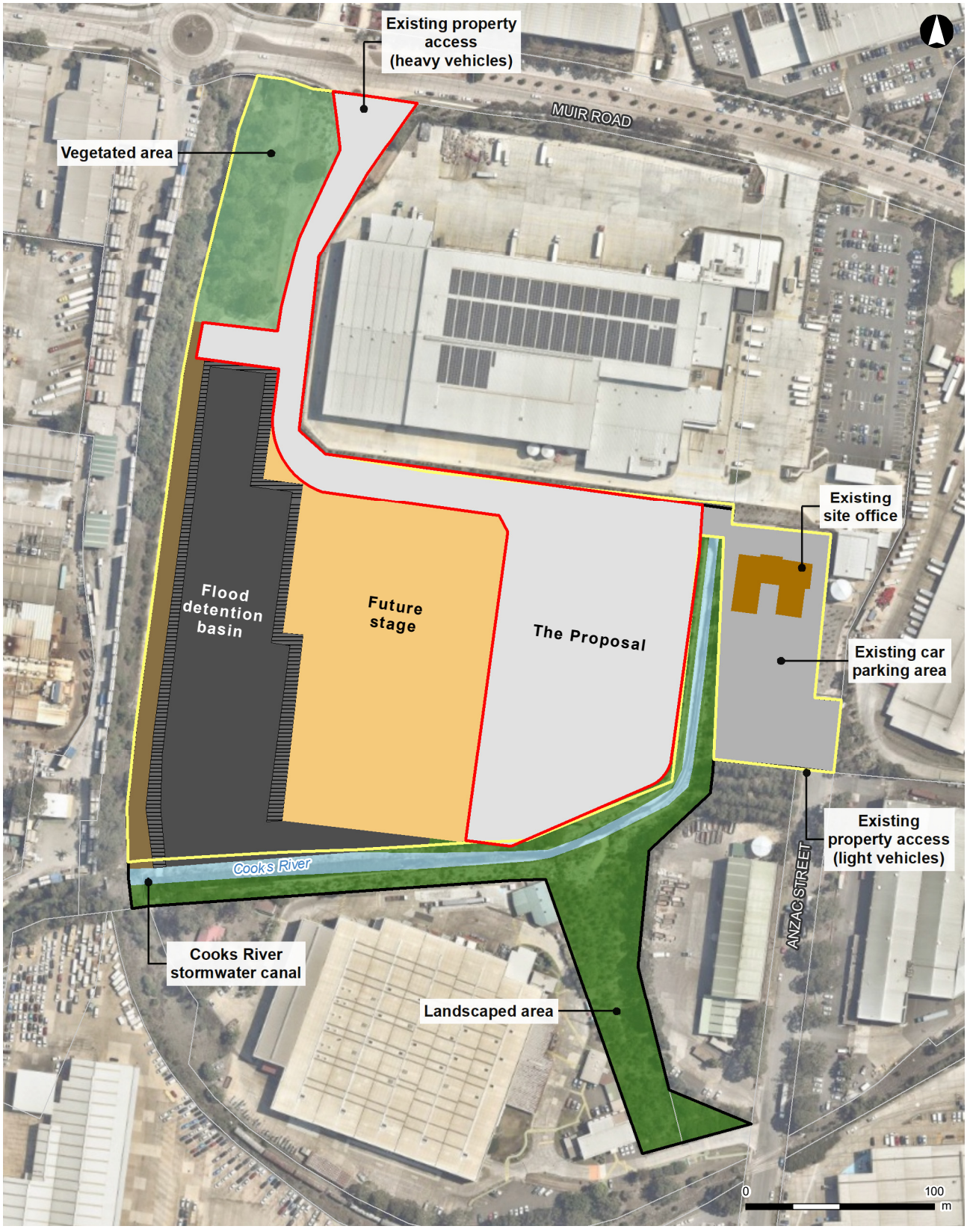
Aspect	Where Addressed
that have been taken to obtain requisite like-for-like biodiversity credits.	
7. The BDAR must be submitted with all spatial data associated with the survey and assessment as per Appendix 11 of the BAM.	Appendix P BDAR
8. The BDAR must be prepared by a person accredited in accordance with the Accreditation Scheme for the Application of the Biodiversity Assessment Method Order 2017 under s6.10 of the Biodiversity Conservation Act 2016	Appendix P BDAR
9. The EIS must map the following features relevant to water and soils including: c. Wetlands as described in s4.2 of the Biodiversity Assessment Method	Figure 14-2
e. Groundwater dependent ecosystems	Figure 14-5
12. The EIS must assess the impact of the development on hydrology, including: c. Effects to downstream water-dependent fauna and flora including groundwater dependent ecosystems	Section 9.5.1 outlines the anticipated impacts of stormwater from the Proposal into the downstream receiving waters. Section 14.3.5
DPIE Water and NRAR	
Assessment of impacts on surface and ground water sources (both quality and quantity), related infrastructure, adjacent licensed water users, basic landholder rights, watercourses, riparian land, and groundwater dependent ecosystems, and measures proposed to reduce and mitigate these impacts	Section 9.5.1 outlines the anticipated impacts of stormwater from the Proposal into the downstream receiving waters. Section 9.6 outlines measures proposed to mitigate water and hydrology impacts on receiving waters. Section 14.3.5

14.2 Methodology

Impacts to biodiversity have been assessed in the BDAR (Appendix P) in accordance with the Biodiversity Assessment Method requirements (BAM) (OEH, 2017a).

A biodiversity assessment was conducted for the Proposal site and wider Chullora RRP and was prepared prior to the completion of the flood mitigation works (DA 366/2020). Figure 14-1 identifies the biodiversity assessment study area investigated by Arcadis' ecologists ('study area') applied in the BDAR. Prior to field surveys, a desktop analysis was conducted for the Proposal site, including database integration and review of relevant literature. Findings made during desktop analysis were used to guide field investigation and inform the attending ecologists of potential biodiversity values which could be encountered.

Field surveys were undertaken prior to the commencement of the flood mitigation works SUEZ have recently applied to develop (DA 366/2020) (refer Section 2.3). Features and areas that were surveyed that would be cleared as part of the flood mitigation works were not considered further in the assessment as any clearing will have been completed prior to the commencement of the construction of the Proposal.



LEGEND

- Chullora RRP site boundary
- Proposal site
- Study area
- Future stage
- Established earthworks
- Batter
- Flood detention basin
- Property boundary

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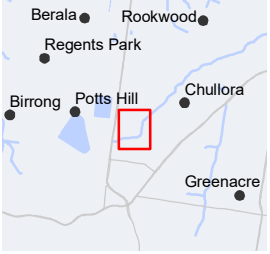


Figure 14-1: Biodiversity investigation area

14.2.1 Database interrogation

Database searches were undertaken in January 2020 to identify records for State and Commonwealth threatened entities that occur, or have the potential to occur, within 10 km of the Proposal site. Databases interrogated for this purpose were as follows:

- NSW BioNet Wildlife Atlas, managed by DPIE
- Protected Matters Search Tool, managed by the Commonwealth Department of Agriculture, Water and the Environment (DoAWE)
- NSW Vegetation Information System (VIS) Classification Database, managed by DPIE
- NSW WeedWise managed by DPIE
- Fisheries Spatial Data Portal, managed by the NSW Department of Primary Industries (DPI)
- Register of critical habitat, managed by NSW DPI.

14.2.2 Literature / mapping review

A review of relevant information was undertaken to identify the existing environment of the Proposal site and provide an understanding of ecological values occurring across the Chullora RRP site and locality. The review focused on ecological reports previously prepared for the Proposal site, as well as property boundaries, vegetation maps, topographic maps, aerial photography and relevant geographic information system (GIS) layers. Relevant literature review included:

- *Chullora Resource Recovery Plan – Tree Removal and Reparation Plan* (Eco Logical Australia, 2016a)
- *Ecological Constraints Assessment – Chullora Resource Recovery Centre Lot 21 and Lot 374* (Eco Logical Australia, 2016b)
- *Geology of the Penrith 1:100,000 Sheet 9039* (Clarke & Jones, 1991)
- *Key Fish Habitat Mapping* (DPI, 1994).
- *Soil landscapes of the Penrith 1:100,000 Sheet 9030* (Hazelton, Bannerman, & Tille, 1989)
- *The Native Vegetation of the Sydney Metropolitan Catchment Management Authority Area* (Office of Environment and Heritage (OEH), 2016)

14.2.3 Field surveys

Field surveys were conducted by Arcadis' ecologists in December 2019 and January 2020 to validate the occurrence of biodiversity value identified during desktop analysis. These surveys also investigated the study area for threatened species, threatened species habitat and threatened ecological communities as listed under the BC Act, and any MNES as listed under the EPBC Act (refer Section 5.2.1).

The methodology applied for the surveys is summarised in Table 14-3.

Table 14-3 Field surveys undertaken at the Proposal site

Survey	Methodology
Vegetation surveys	Rapid assessment vegetation points were conducted to capture variation between areas of native vegetation across the Proposal site as well as the structure of non-native vegetation. Data from these assessment points was utilised to assist in classifying native vegetation within the Proposal site into Plant Community Types (PCTs) and separate vegetation zones based on condition classes. The identification of PCTs and vegetation types in the Proposal study area was predominantly based on: • Structure and species composition consistent with descriptions in the VIS Classification database and other published references • Characteristic tree species present • Previous regional mapping as an equivalent vegetation type • Landscape position. Previous vegetation assessments undertaken by the Sydney Metropolitan Catchment Management Authority (CMA) (OEH, 2016) were ground-truthed during the vegetation surveys.
Fauna surveys	Incidental diurnal fauna surveys were conducted and involved the recording of all fauna species opportunistically seen or heard. Field surveys also included incidental searches for indirect evidence of fauna, such as scats, nests, burrows, tracks, scratches, chewed cones and diggings. General fauna habitat assessments were also conducted across the Proposal site. This involved survey for the following features: • Vegetation type, structure and extent • Wetlands, watercourses, natural and artificial ponds, dams, soaks and drainage channels • Adjacent habitats and barriers (natural or artificial) between the Proposal site and adjacent lands • Hollow-bearing trees species, size of hollows present and signs of fauna occupation • Forage trees including blossom and fruit trees for birds and Grey-headed Flying-fox and feed trees for Koala • Caves and cliffs • Artificial microbat roosts (e.g. culverts, bridges, tunnels and mine audits) • Terrestrial shelter habitat such as coarse woody debris, rock outcrops and artificial shelter (i.e. corrugated iron sheets, building refuse, rubbish) for invertebrates, amphibians, reptiles and small terrestrial mammals.
Threatened species surveys	Targeted threatened species surveys were conducted for one threatened flora species: *Acacia pubescens (*Downy Wattle). This species was identified as having potential to occur due to the presence of multiple recent records nearby and the capacity for this species to survive in open, disturbed areas in association with exotic species (National Parks and Wildlife Service (NPWS), 2003).

14.3 Existing environment

14.3.1 Landscape assessment

The Proposal site is located within the Cumberland sub-region of the Sydney Basin Interim Biogeographic Regionalisation for Australia (IBRA) Bioregion (Figure 14-2). The Cumberland sub-region is situated in a rain shadow area between the Blue Mountains and east coast on low rolling hills and valleys.

The geology is dominated by Triassic Wianamatta groups shales and sandstones with Quaternary alluvium present along the main streams. Vegetation associated with the Cumberland sub-region include woodlands dominated by *Eucalyptus moluccana*, *E. tereticornis* and *E. crebra* on the shale hills and *Angophora subvelutina, E. amplifolia* and *E. tereticornis* with abundant *Casuarina glauca* on river flats (Morgan, 2001).

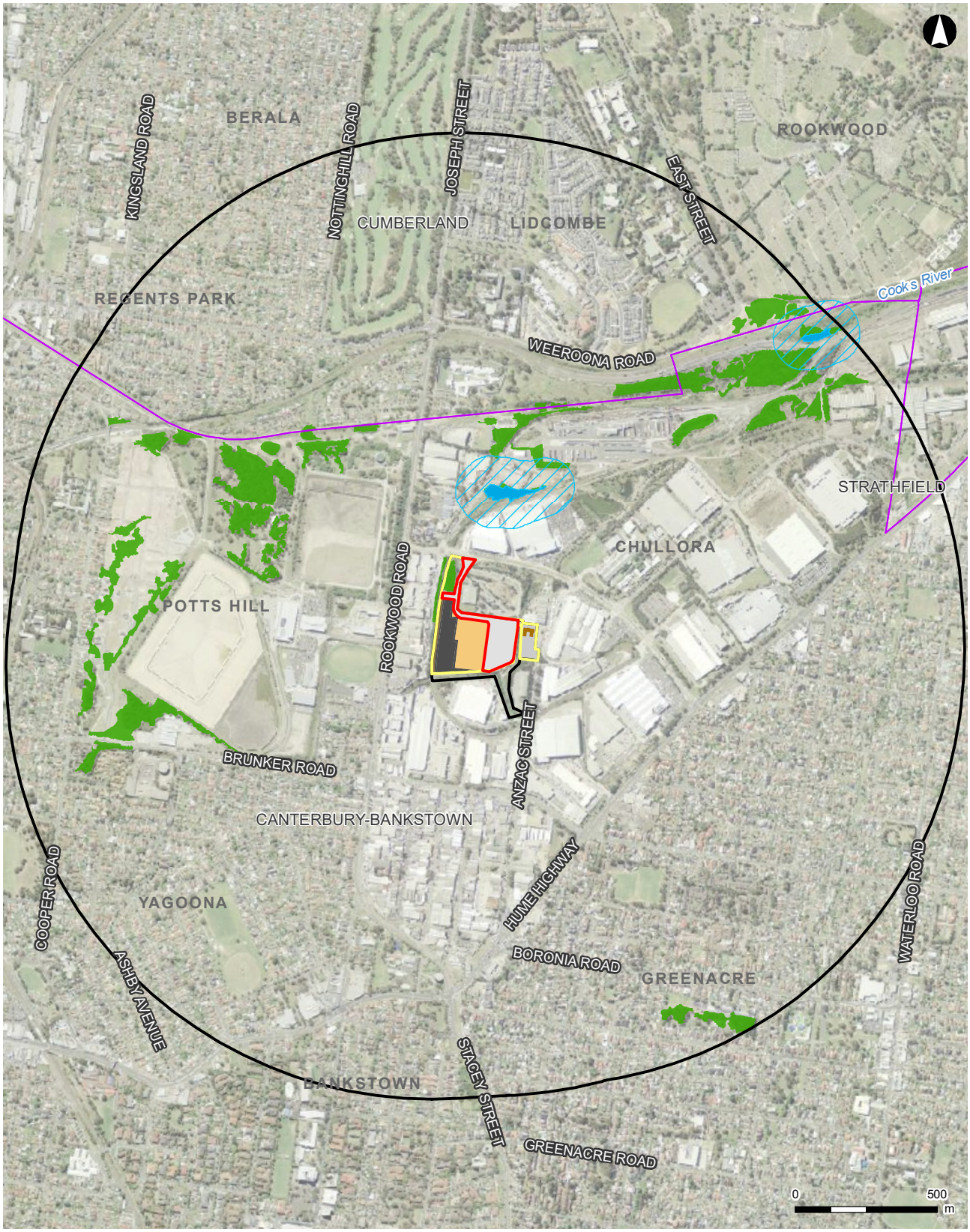
The Proposal site is situated within the Ashfield Plains Mitchell Landscape (DPIE EES, 2016) being an over cleared landscape with 98 per cent of the landscape currently cleared. Vegetation of the Ashfield Plans Mitchell Landscape includes open forests of *Eucalyptus fibrosa* and *Eucalyptus moluccana* with *Leptospermum* spp. along creeks and forests of *Syncarpia glomulifera, Eucalyptus resinifera, Eucalyptus punctata, Eucalyptus saligna* and *Eucalyptus pilularis* with a grassy understorey of *Themeda triandra* on moister sites (DECC, 2002).

Landscape features relevant to the Proposal site are summarised below in Table 14-4.

Table 14-4 Landscape features

Landscape feature	Proposal site
Native vegetation cover in landscape	There is no native vegetation within the Proposal site. Native vegetation cover is limited to the north-western corner of the Chullora RRP site (Figure 14-1) Native vegetation, as mapped by OEH (2016), is relatively sparse across the landscape in the locality of the Proposal site (Figure 14-2)
Cleared areas	The Proposal site is clear of vegetation
Rivers and streams	The Cooks River stormwater canal borders the southern edge and traverses through the eastern section of the Proposal site
Riparian vegetation	The Cooks River stormwater canal largely comprises a formalised concrete drainage channel, with some landscaped plantings located within the canal easement
Wetlands	There are no natural or artificial wetlands within the Proposal site
Connectivity features	The vegetation present in the Chullora RRP site is situated within a landscape of extensive industrial and residential developments. Vegetation in the locality is generally restricted to planted roadside vegetation and small, isolated areas of exotic and remnant native vegetation
Areas of geological significance and soil hazard features	The Proposal site is situated within Disturbed Terrain soil landscape (DPIE, 2020a). This soil landscape is characterised by level plain to hummocky terrain which has been extensively disturbed by human activity, with most of the original soil either removed, buried or generally disturbed. Disturbed Terrain has highly variable erosion hazards, ranging from low to extreme. The landscape is limited by mass movement, slope and erosion hazards as well as seasonal waterlogging, non-cohesive soils and rocky outcrops (DPIE, 2020a) The Proposal site does not contain any Karst, caves, crevices, cliffs or other areas of geological significance

Landscape feature	Proposal site
Areas of outstanding biodiversity value (AOBVs)	Areas of outstanding biodiversity value (AOBVs) are currently limited to areas previously declared as critical habitat under the *Threatened Species Act 1995* (TSC Act). No AOBVs occur within or surrounding the Proposal site



LEGEND

- Chullora RRP site boundary
- Proposal site
- Study area
- 1500m buffer
- Future stage
- Flood detention basin
- Established earthworks
- Existing car parking area
- Existing site office
- Local government area
- Native vegetation

NSW Coastal Management SEPP (2018)

- Coastal Wetlands
- Coastal Wetlands Proximity Area

Note: IBRA region Sydney Basin, subregion Cumberland covers entire study area

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Figure 14-2: Nearby ecological features

14.3.2 Native vegetation

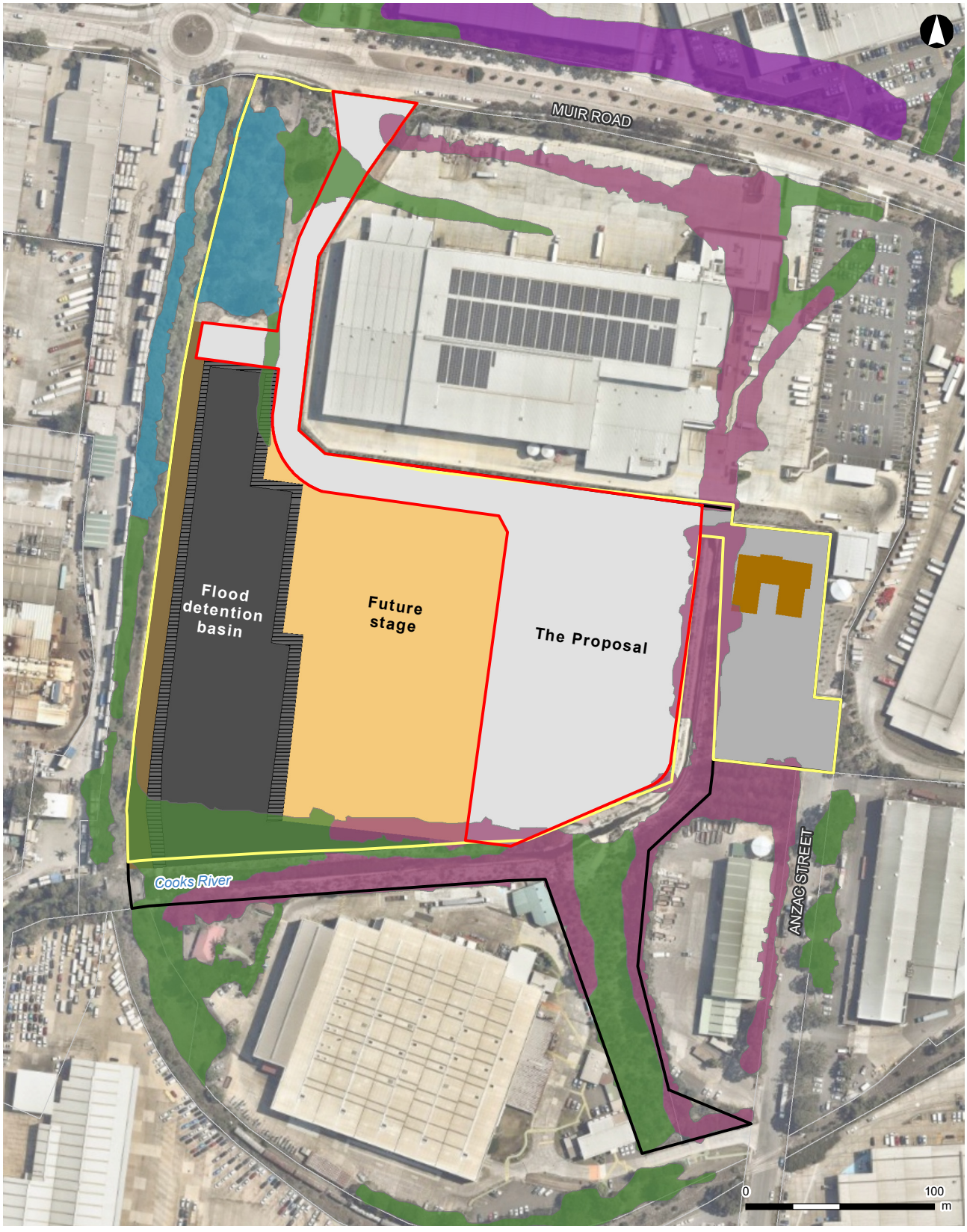
Regional vegetation mapping

OEH (2016) mapped the vegetation of the Sydney Metropolitan CMA Area. The Sydney CMA Area encompasses the eastern portions of the Sydney Metropolis, extending from the coastline to the catchments that flow to the Parramatta, Georges and Hacking River.

Three vegetation types were identified within the study area:

- Castlereagh Ironbark Forest: *Broad-leaved Ironbark - Melaleuca decora shrubby open forest on clay soils of the Cumberland Plain, Sydney Basin Bioregion*
- Urban exotic / native vegetation
- Weeds and exotic plantings.

Figure 14-3 shows the OEH (2017b) vegetation mapping. It is noted that development works (including the recent formalisation of the Cooks River stormwater canal, and the flood mitigation works currently being determined by Council (DA 366/2020)) will have occurred across the Chullora RRP prior to the commencement of the construction of the Proposal, which would alter areas of vegetation across the site.



LEGEND

- Chullora RRP site boundary
- Proposal site
- Study area
- Future stage
- Established earthworks
- Batter
- Flood detention basin
- Car parking area 1
- Existing site office
- Property boundary

Vegetation zone (OEH, 2016)

- Cleared
- Castlereagh Ironbark Forest (S_DSF01)
- Urban Exotic/Native
- Weeds and Exotics

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Figure 14-3: Regional vegetation mapped within the Proposal site

Plant community types

Vegetation within the study area was identified and mapped based on a review of existing regional vegetation spatial datasets, observations made during site inspections, and analysis of data collected during field surveys.

One PCT was identified outside of the Proposal site, in the north-western corner of the Chullora RRP site. This PCT was identified as *Broad-leaved Ironbark - Melaleuca decora shrubby open forest on clay soils of the Cumberland Plain, Sydney Basin Bioregion (PCT 715)* and covers approximately 0.34 ha of land adjacent to the Proposal site (refer Figure 14-4). This vegetation was determined to be of moderate condition.

Table 14-5 PCTs identified within the study area

Plant Community Type	Description	Total area mapped in Proposal study area (ha)	Total area mapped within Proposal site (ha)
Broad-leaved Ironbark - Melaleuca decora shrubby open forest on clay soils of the Cumberland Plain, Sydney Basin Bioregion (PCT 725)	PCT 725 is associated with clay soils derived from Tertiary alluvial deposits, and ranges from a moderately tall open eucalypt forest or woodland to a low dense thicket of paperbarks with low emergent eucalypts.	0.34	0

Weeds

A suite of exotic species were recorded in the study area of which three are listed as Priority weeds (DPIE, 2020b) under the NSW *Biosecurity Act 2015* for the Greater Sydney region, which includes the City of Canterbury Bankstown LGA. Of these, two are also listed as Weeds of National Significance (WoNS) (DotEE, 2019) (see Table 14-6).

Table 14-6 Priority weeds listed under the Biosecurity Act 2015 and WoNS recorded in the Proposal study area

Scientific Name	Common Name	Listed as a WoNS?
Olea europaea subsp. cuspidata	African Olive	NO
Asparagus aethiopicus	Asparagus Fern	YES
Opuntia stricta	Common Prickly Pear	YES

Fauna habitat

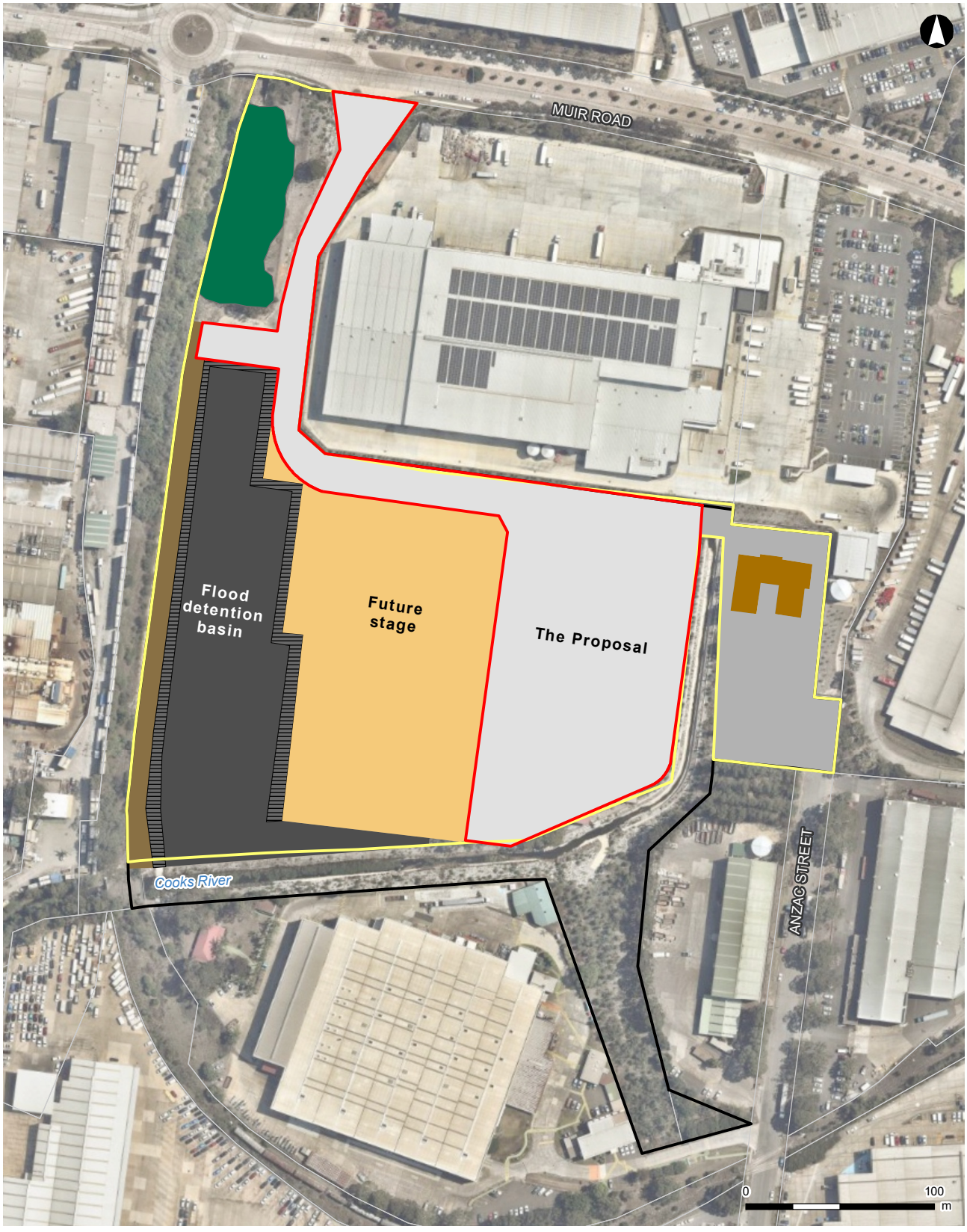
Vegetation identified in the north-western corner of the Chullora RRP site is considered to provide low value habitat for fauna species, due to high levels of disturbance, fragmentation and weed incursion. However, eight common fauna species were recorded during surveys including:

- Australian Raven (*Corvus coronoides)*
- Australian White Ibis (*Threskiornis moluccus*)
- Common Myna (*Acridotheres tristis*).
- Crested Pigeon (*Ocyphaps lophotes*)
- Magpie-lark (*Grallina cyanoleuca*)
- New Holland Honeyeater (*Phylidonyris novaehollandiae*)

- Pacific Black Duck (*Anas superciliosa*)
- Pale-flecked Garden Sunskink (*Lampropholis guichenoti*).

Dense understorey vegetation and associated leaf litter provides suitable foraging and shelter habitat for small terrestrial species such as the Pale-flecked Garden Sunskink (*Lampropholis guichenoti*).

Areas of open grassland, waterways and landfills within the surrounding area attract common urban bird species including the Australian White Ibis (*Threskiornis moluccus*) and Common Myna (*Acridotheres tristis*).



LEGEND

- Chullora RRP site boundary
- Proposal site
- Study area
- Future stage
- Established earthworks
- Batter
- Flood detention basin
- Car parking area 1
- Existing site office
- Property boundary

Plant Community Type

- Broad-leaved Ironbark - Melaleuca decora shrubby open forest on clay soils of the Cumberland Plain, Sydney Basin Bioregion (PCT 725)

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Figure 14-4: Ground truthed vegetation

14.3.3 Threatened ecological communities

The *Cooks River / Castlereagh Ironbark Forest in the Sydney Basin Bioregion* is listed as an endangered ecological community (EEC) under the BC Act, and as critically endangered under the EPBC Act as shown in Table 14-7.

The patch of PCT 725 located in the north-western corner of the Chullora RRP site qualifies for listing as the EEC *Cooks River / Castlereagh Ironbark Forest in the Sydney Basin Bioregion* under the BC Act, however does not meet the condition thresholds to qualify as the EPBC listed EEC. This patch of vegetation is not subject to direct impacts from the Proposal.

Table 14-7 Threatened ecological communities in the Proposal study area

TEC Name (EPBC Act)	EPBC Act Status	BC Act
Cooks River/Castlereagh Ironbark Forest of the Sydney Basin Bioregion	Critically Endangered	Endangered

14.3.4 Threatened Species

Threatened plants

No threatened plants were identified within the Proposal site or broader study area during field investigations.

Due to multiple nearby sightings of the Downy Wattle (*Acacia pubescens*) and for its capacity to exist in a disturbed environment, targeted searches were conducted for the threatened plant within the study area. Despite thorough survey no Downy Wattle were found.

Threatened animals

During field investigations, no threatened animals were sighted, and no signs of occurrence identified. It was also noted that threatened species habitat is not present within the Proposal site. In the patch of PCT 725 located adjacent to the Proposal site suboptimal foraging habitat is present for Grey-headed Flying Fox (*Pteropus poliocephalus*) in flowering eucalypt trees.

14.3.5 Groundwater dependent ecosystems

The BoM's Groundwater Dependent Ecosystems (GDEs) Atlas was reviewed to determine the occurrence of potential GDEs within and surrounding the Proposal site. The results of this review show that there are no potential GDEs within the Proposal site. The nearest GDEs are approximately one km to the west and 1.2 km to the north-east of the Proposal site, as shown in Figure 14-5.



LEGEND

- Chullora RRP site boundary
- Proposal site
- Study area
- Future stage
- Flood detention basin
- Established earthworks
- Existing car parking area
- Existing site office
- Railway
- Watercourse
- High potential
- Moderate potential
- Low potential

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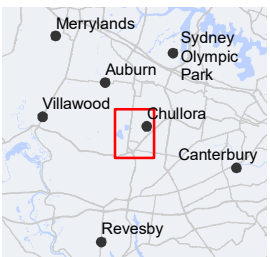


Figure 14-5: Groundwater Dependent Ecosystems (BOM, 2017)

14.4 Construction impacts

No direct impacts are proposed to occur to biodiversity to facilitate the Proposal. Therefore, the Proposal would not have any impacts to threatened species, threatened species habitat, threatened ecological communities or MNES as listed under the BC Act and EPBC Act.

During the construction phase of the Proposal, there is the potential for indirect impacts to be caused to biodiversity including:

- **Inadvertent impacts on adjacent habitat or vegetation** – A patch of *Broad-leaved Ironbark - Melaleuca decora shrubby open forest,* which qualifies as a TEC, occurs in close proximity to Proposal site at its north-western extent. While construction activities in close proximity to this patch of native vegetation represent a risk of inadvertent impacts, the probability of any inadvertent impacts occurring in this area is low based on the implementation of relevant mitigation measures discussed in Section 14.6
- **Reduced viability of adjacent habitat due to edge effects** - The patch of native vegetation adjacent to the Proposal boundary in the north-western extent is already exposed to high levels of edge effects. As there is no connecting vegetation to be removed by the Proposal it is unlikely that these edge effects would be exacerbated
- **Reduced viability of adjacent habitat due to noise, dust or light spill** - As the surrounding area is highly industrialised, with several major roads, train lines and industrial developments, adjacent habitat is already subject to significant noise, dust and light spill. It is considered that any additional potential impacts of dust that can be attributed to the Proposal would be negligible due to the limited nature and timeframe of the construction activities
- **Transport of weeds and pathogens from the site to adjacent vegetation** - Whilst there is a potential risk of spreading exotic species to areas beyond the Proposal boundary, with the implementation of relevant mitigation measures (discussed below) this is considered unlikely.

14.5 Operation impacts

Operational impacts as a result of the Proposal are considered unlikely to occur and would be of minor severity in the event they do occur. These potential operational impacts are limited to the following:

- Inadvertent impacts on adjacent habitat or vegetation
- Reduced viability of adjacent habitat due to edge effects.
- Indirect fauna impacts may result from external night lighting within the Proposal site
- Noise and vibration impacts.

Given the implementation of the mitigation measures presented in Sections 8.6 and Section 11.6 to minimise air quality and noise impacts, and the industrial setting of the Proposal site, these impacts are considered to be minor or negligible and easily managed.

14.6 Mitigation Measures

Avoidance and minimisation measures have been implemented during design of the Proposal to limit impacts to biodiversity including:

- Locating the Proposal completely within cleared lands, devoid of vegetation and other biodiversity values
- Reducing the clearing footprint of the Proposal to the fullest extent possible
- Locating ancillary facilities in areas where there are no biodiversity values including native vegetation, threatened species, threatened species habitat or TECs
- Making provision for the demarcation, ecological restoration, rehabilitation and / or ongoing maintenance of retained native vegetation habitat, specifically for the identified TEC in the north-western portion of the Chullora RRP site.

Construction and operational activities of the Proposal are not proposed to directly impact biodiversity, however there is the potential for minor indirect impacts. The measures in Table 14-8 below will be implemented to mitigate potential indirect biodiversity impacts during construction and operation of the Proposal.

Table 14-8 Measures to be implemented to minimise indirect impacts to biodiversity

Phase	Mitigation measure	Timing
BD1	A CEMP, or equivalent, will be prepared for the Proposal to minimise impacts to biodiversity and will include the following: • Protocols around 'No Go' zones. Prior to commencement of construction, the Proposal site will be delineated from the patch of native vegetation in the north-western corner of the Chullora RRP with fencing to prevent inadvertent damage to the TEC from construction activities. Signage should be attached to the fence identifying the area as a 'No Go Zone' • Environmental constraints maps clearly identifying the locations of threatened ecological communities adjacent to the Proposal boundary • Site induction protocols. Site inductions will include a briefing on local fauna and protocols to be undertaken if fauna are encountered • Requirements for lighting. Where feasible, directional lighting will be used where lighting is required • Consideration of the selection of plant and processes with reduced noise emissions.	Construction
BD2	If any animal is injured, the relevant local wildlife rescue agency (e.g. WIRES) and / or veterinary surgery will be contact as soon as practical. Until the animal can be cared for by a suitably qualified animal handler, if possible, the stress of the animal will be reduced by: • Handling fauna with care and as little as possible • Covering larger animals with a towel or blanket and placing in a large cardboard box • Placing small animals in a cotton bag, tied at the top • Keeping the animal in a quiet, warm, ventilated, and dark location.	Construction and operation

Conclusion

A biodiversity assessment was conducted for the Proposal site to investigate potential impacts to biodiversity values. The assessment included a database investigation for records of threatened entities listed under State and Commonwealth legislation, review of related literature, and a site visit to ground truth and evaluate the presence and quality of onsite biodiversity features.

No native vegetation, threatened species, threatened species habitat or ecological communities are present within the Proposal site. As such, there would be no direct impacts to biodiversity from the construction or operation of the Proposal. A patch of native vegetation, characteristic of the *Cooks River / Castlereagh Ironbark Forest in the Sydney Basin Bioregion* TEC is present at the north-western extent of the Chullora RRP site. This patch of vegetation is outside of the Proposal site and would not be directly impacted by the Proposal.

Construction and operational impacts are limited due to the nature of the Proposal site; however, mitigation measures have been identified to mitigate biodiversity impacts (specifically fauna) during construction and operation.

15 ABORIGINAL HERITAGE

Summary

An Aboriginal heritage due diligence assessment was undertaken by Artefact (Appendix Q) to satisfy the requirements of the *National Parks and Wildlife Act 1974.* A comprehensive review was included in the assessment for the Chullora RRP concerning historical and environmental contexts of the site, ethnohistorical background of the locality, and likelihood examinations for the presence of heritage items.

The Proposal site has been extensively disturbed by human activity, including disturbance, removal, or historical filling and land reclamation activities. Vegetation within the site has been completely cleared and previous wetlands have been filled. The Proposal site is located within 200 m of Cooks River stormwater channel, however, there has been much disturbance to the site through the construction of industrial buildings, railway lines, roads, and land modification for water management and levelling.

Site investigation carried out by Artefact conducted prior to the commencement of the flood mitigation works (subject to DA 366/2020) did not identify Aboriginal objects within the investigation area. Flood mitigation works will substantially alter the landform compared to that inspected during the site investigation, through excavation, filling and capping. It was determined that given the existing low likelihood of Aboriginal objects being present, which would be exacerbated by the subsequent flood mitigation works, the Proposal is considered to have a negligible likelihood of impacting any Aboriginal heritage items.

Further, an AHIMS extensive search was conducted to investigate any previous records of Aboriginal sites within 200 m of the Proposal site. No sites have been recorded.

Under the unlikely scenario unexpected artefacts identified as having Aboriginal heritage significance are exposed either during construction or operation, work would be required to temporarily cease and the EES Group would be informed, to determine the appropriate management strategy. This measure would also be included within the existing CEMP and OEMP for both construction and operation of the Proposal.

15.1 Introduction

Artefact have undertaken a Aboriginal heritage due diligence assessment to determine the likelihood of impact to Aboriginal heritage items or values at the Proposal site and address the SEARs issued by DPIE. The due diligence assessment is provided in Appendix Q of this EIS. Table 15-1 provides a summary of the relevant SEARs which relate to Aboriginal heritage, and where these have been addressed in this EIS.

Table 15-1 SEARs (Aboriginal heritage)

SEARs	Where addressed
Aboriginal Cultural Heritage	
Including an assessment of Aboriginal cultural heritage values that satisfies the due diligence requirement of the *National Parks and Wildlife Act 1974*	Chapter 15 Aboriginal heritage Appendix Q Aboriginal due diligence assessment

Further to the above, the EES Group require further details on specific requirements relating to their authority. These requirements are discussed throughout the report as indicated in Table 15-2.

Table 15-2 Other agency requirements and relevant report sections (Aboriginal heritage)

Aspect	Where addressed
EES Group	
An assessment of the heritage impacts of The Proposal. The assessment shall: Identify and describe the Aboriginal cultural heritage values that exist across the whole area that would be affected by the development and document these in an Aboriginal Cultural Heritage Assessment Report (ACHAR). This may include the need for surface survey and test excavation. The identification of cultural heritage values must be conducted in accordance with the Code of Practice for Archaeological Investigations of Aboriginal Objects in NSW (DECCW, 2010), and guided by the Guide to investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW (OEH, 2011).	An ACHAR has not been prepared for the Proposal. An Aboriginal heritage due diligence assessment (Appendix Q) was conducted for the Proposal site. The site investigations and desktop assessment of the Proposal site's context completed as part of the due diligence assessment confirmed did not identify any Aboriginal artefacts and concluded that there was a low likelihood of any being present across the Chullora RRP site. Further the flood mitigation works (DA 366/2020) recently proposed by SUEZ (refer Section 2.3) will substantially alter the landform of the Chullora RRP, and will include clearing, excavation and filling activities. Given the existing low likelihood of Aboriginal items being presents, which would be exacerbated by the flood mitigation works, the Proposal is considered to have negligible potential of impacting any Aboriginal heritage items. An ACHAR was therefore not considered necessary.
Consultation with Aboriginal people must be undertaken and documented in accordance with the Aboriginal cultural heritage consultation requirements for proponents 2010 (DECCW). The significance of cultural heritage values for Aboriginal people who have a cultural association with the land must be documented in the ACHAR.	
Impacts on Aboriginal cultural heritage values are to be assessed and documented in the ACHAR. The ACHAR must demonstrate attempts to avoid impact upon cultural heritage values and identify any conservation outcomes. Where impacts are unavoidable, the ACHAR must outline measures proposed to mitigate impacts. Any objects recorded as part of the assessment must be documented and notified to OEH. Note that due diligence is not an appropriate assessment, an ACHAR is required.	

15.2 Methodology

An Aboriginal heritage due diligence assessment was undertaken by Artefact Heritage (2020) to determine the potential for the Proposal to impact any Aboriginal heritage items or values. The assessment included a review of the Chullora RRP's history, a summary of the Aboriginal history and context, and examination of the likely presence of any heritage items or places of value.

An Aboriginal Heritage Information Management System (AHIMS) extensive search was conducted on 28 January 2020 with a buffer of 200 m around the Proposal site to identify any Aboriginal sites which may have been previously recorded. DPIE maintains the AHIMS database; a comprehensive register of Aboriginal sites that have been recorded across NSW.

It is noted that all of the heritage investigations completed for the Chullora RRP site were conducted prior to the commencement of recent flood mitigation works (DA 366/2020) proposed by SUEZ across the Chullora RRP (refer Section 2.3). To provide a conservative assessment the due diligence assessment included consideration of the Chullora RRP site context and features prior to the completion of the flood mitigation works. The flood mitigation works would require disturbance, vegetation clearing and earthworks across the entirety of the Proposal site which would substantially alter the context of the site, providing a further level of disturbance than has been identified within this assessment.

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15.3 Existing environment

15.3.1 Historical context

Historical land use records and aerial photography (Appendix Q) indicate that the Proposal site was associated with the former Chullora Railway Workshop complex, which opened in 1923. Development of the Chullora Railway Workshops continued up until the 1940s, where the workshops covered a 200 ha area and comprised of three major branches which included 10 specialist workshops.

During WWII, the Chullora Railway Workshops were utilised as aircraft and military tank production facilities. In 1948, the 18 ha Chullora Railway Workers Camp was established at the corner of The Hume Highway and Brunker Street, to southwest of the Proposal site. This camp was a temporary housing precinct which came to provide housing to the over 2000 post war migrants. The Chullora Rail Workshops continued to operate into the 1990s but was subject to significant surrounding land use change as heavy industrial precincts were moved into the Greater Western Sydney region. The workshop ceased operations in 1994.

Following the decommissioning of the workshop operations, the Proposal site was developed as the previous Chullora RRC which commenced operations in 1997. This facility was subject to a fire in 2017 and subsequently demolished.

Due to the existing high levels of disturbance and subsurface exposure, the Proposal site is not associated with any areas of archaeological sensitivity.

15.3.2 Environmental context

The Proposal site is characterised by disturbed terrain in soil landscape mapping (refer to Section 10.3.1). This terrain has been extensively disturbed by human activity, including vegetation removal, historical filling, land reclamation activities, stormwater channel upgrade works, intrusive site investigations and remediation works. Vegetation within this landscape has been completely cleared and previous wetlands have been filled.

The Proposal site is located within 200 m of the Cooks River stormwater canal, which starts at nearby Yagoona, and runs along the southern boundary of the Proposal site within the Chullora RRP site. The Cooks River has been subject to high levels of disturbance due to the industrial nature of the area and the recent Sydney Water upgrades for water management and levelling. The current position of the Cooks River around the investigation area has been canalised and modified to fit its current landscape and therefore is no longer representative of its original source or form.

15.3.3 Ethnohistorical background

Aboriginal people traditionally lived in small family or clan groups that were associated with particular territories or places. The language spoken across the Sydney region was known as Darug, and this is thought to have extended from Appin in the south to the Hawkesbury River, west of the Georges River, Parramatta, the Lane Cove River and Berowra Creek (Attenbrow, 2010). The Cumberland Plain area (region of the Proposal) was home to several different clan groups.

Early historical accounts of Aboriginal people provide valuable observations of Aboriginal customs and life during the early period of European occupation. Language dialects varied across the Cumberland Plain, although early Europeans recorded observations of interaction and mutual intelligibility between Darug speakers from different regions. There are two possible groups associated with the local area:

- Bediagal or Bidjigal: observed in association with Arrowanelly, an island on the western side of Botany Bay (Attenbrow, 2010)
- Wangal: observed from the southern shore of the Parramatta River from near Darling Harbour to Rose Hill (Attenbrow 2010).

Observations of Aboriginal people living on the Cooks River made early after the British arrival in Australia indicate the importance of these riverine and estuarine environments for Aboriginal people.

Historical records from British marine officers note camps constructed along the Cooks River in 1788 and observed Aboriginal people using canoes for transport across the river in the 1830s.

15.3.4 Archaeological context

Artefact conducted a preliminary Aboriginal and non-Aboriginal Archaeological Assessment of the Proposal site in 2016 (Artefact, 2016). It was determined at the time to have low potential to contain intact archaeological deposits and no further Aboriginal heritage investigation was recommended.

A search of the AHIMS database in January 2020 revealed that there were no recorded Aboriginal sites located within 200 m of the Proposal site.

15.3.5 Site characteristics

The Proposal site will consist of an established levelled earthworks pad; raised above the one in 100-year flood event comprising of imported fill material and an existing formalised access driveway for heavy vehicles. Adjacent to the Proposal site are other components of the Chullora RRP including, but not limited to, a flood detention basin, stormwater infrastructure, a future development area, existing site office and carpark.

15.4 Construction impacts

Based on a review of the findings of the Aboriginal due diligence assessment and consideration of the alteration to site landform that will occurs as a result of flood mitigation works (DA 366/2020) it was determined that there is a very low likelihood of finding any Aboriginal objects or areas of archaeological sensitivity.

The Proposal site would consist of a level earthworks foundation and an existing heavy vehicle access way prior to commencement of construction. No earthworks are proposed during construction of the Proposal. There is a very low likelihood for Aboriginal heritage items or values to be present within the Proposal site or wider Chullora RRP. The land use history of Chullora RRP and the truncated / heavily modified landform context with frequent evidence of historical period disturbance, comprising mostly of fill reduces the likelihood of any intact archaeological items being present.

Any potential to uncover unknown Aboriginal heritage items would be linked to the remote possibility that items have been transferred to the Proposal site within imported fill form an external location.

15.5 Operation impacts

Given the operation of the Proposal site would occur post construction, it is extremely unlikely that items of Aboriginal heritage significance would be found during operation as it is expected they would be found during the construction phase of the Proposal. Operation of the Proposal is therefore not expected to impact on known items of Aboriginal heritage.

15.6 Mitigation measures

As the Proposal site is considered highly disturbed, it is unlikely that items of Aboriginal heritage significance would be found during construction or operation of the proposal. Table 15-3 outlines the mitigation measures that will be implemented by SUEZ should any unexpected Aboriginal heritage items be encountered.

Table 15-3 Mitigation measures (Aboriginal heritage)

ID	Mitigation measures	Timing
AH1	An unexpected finds protocol will be included within the CEMP and OEMP for the Proposal. Should unexpected artefacts be exposed, which are identified as having Aboriginal heritage significance, works would temporarily cease and the EES Group would be informed, to determine the appropriate management strategy. The duration of this 'stop work' would depend on the integrity and significance of the heritage item.	Construction and Operation
AH2	Should items need to be disturbed (exposed, moved, damaged or destroyed), this would not be undertaken until an excavation permit is received under Section 139 of the *Heritage Act 1977 (Heritage Act)*.	Construction and Operation

Conclusion

An Aboriginal due diligence assessment was undertaken by Artefact (2020) to assess the potential for the Proposal to impact on Aboriginal heritage items or values during construction and operation.

A site investigation conducted by Artefact did not identify any Aboriginal objects within the investigation area. The site investigation was undertaken before the flood mitigation works (DA 366/2020) being carried out (subject to approval).The flood mitigation works will substantially alter the landform compared to that inspected during the site investigation, through excavation, filling and capping. It was determined that given the existing low likelihood of Aboriginal items being present, which would be exacerbated by the subsequent flood mitigation works, the Proposal is considered to have a negligible likelihood of impacting any Aboriginal heritage items.

Further, an AHIMS extensive search was conducted to investigate any previous records of Aboriginal sites within 200 m of the Proposal site. No sites were recorded.

In the unlikely circumstance that artefacts of Aboriginal heritage significance are exposed during construction or operation, work will cease and an unexpected finds protocol will be implemented.

16 NON-ABORIGINAL HERITAGE

Summary

A desktop assessment has been carried out to identify the potential for the construction and operation of the Proposal to impact on non-Aboriginal heritage items. This desktop assessment included a review of applicable State and Federal registers and databases.

The Proposal site does not contain any registered items of non-Aboriginal heritage significance. Seven items of non-Aboriginal local and state heritage significance are located within one km of the Proposal site, including one archaeological site and one heritage conservation area. These heritage items are listed below:

- “Carinya” House - located at 50 Rookwood Road, Yagoona
- Chullora Railway Workshops – located at Beaufort Place, Chullora, NSW 2190 (adjacent to Hume Hwy)
- Former Lidcombe Hospital Site (heritage conservation area) – located at Joseph Street, Lidcombe
- Minali Special School (early twentieth century residence) – located at 169 Joseph Street, Lidcombe, NSW
- Potts Hill Reservoirs 1 and 2 and site - located at 146 Rookwood Road, Chullora
- Pressure Tunnel, Shaft No 1 and associated infrastructure - located at 189 Rookwood Road, Chullora
- Site of Royal Arms Inn (archaeological site) – located at 2-2A Hume Highway, Chullora, NSW 2190.

None of these non-Aboriginal heritage items or conservation areas of significance are within close proximity (less than 150 m) of the Proposal site.

Impact to non-Aboriginal heritage items in the vicinity of the Proposal would be limited to potential indirect impacts (visual, noise and vibration) however these impacts are considered negligible.

Should the Proposal interact with undiscovered heritage items of significance it is recommended that construction works or operations cease and the item be assessed by a suitably qualified person. The DPIE would be subsequently notified to determine the appropriate management strategy for the heritage item.

16.1 Introduction

This section provides an assessment of impacts to non-Aboriginal heritage items or sites from the construction and operation of the Proposal. The SEARs do not include specific requirements for the assessment of impacts to items or sites of non-Aboriginal heritage significance, however in order to provide a thorough and robust assessment of the Proposal a desktop assessment has been undertaken to identify, assess and summarise the impacts that the Proposal could cause

16.2 Methodology

A review of applicable State and Federal registers was undertaken on 19 and 21 November 2019 to identify any non-Aboriginal heritage items within the vicinity of the Proposal site.

Items of non-Aboriginal heritage significance are listed in statutory registers, providing them with varying levels of protection. Non-Aboriginal heritage items are listed at a National, State or Local level on the following registers:

- EPBC Act Protected Matters Search Tool (DoAWE 2020b)
- National Heritage Register (DoAWE 2020c)
- NSW State Heritage Register (DPIE, 2020c)

- Section 170 NSW State agency heritage registers (DPIE 2020c)
- *Auburn Local Environmental Plan 2010* (ALEP 2010)
- BLEP 2015.

16.3 Existing environment

As discussed in Section 2.3 historical land use records and aerial photography indicate that the Proposal site was associated with the former Chullora Railway Workshop complex. Development of the Chullora Railway Workshops continued until the 1990s but was subject to significant surrounding land use change as heavy industrial precincts were moved into the Greater Western Sydney region. The Proposal site was developed as the Chullora RRC which commenced operations in 1997. This facility was subject to a fire in 2017 and subsequently demolished.

16.3.1 Environmental context

The Proposal site is characterised by disturbed terrain in soil landscape mapping (refer to Section 10.3.1). This terrain has been extensively disturbed by human activity, including vegetation removal, historical filling, land reclamation activities, stormwater channel upgrades, intrusive site investigations and remediation works. Vegetation within this landscape has been completely cleared and previous wetlands have been filled.

16.3.2 Archaeological context

Artefact conducted a preliminary Aboriginal and non-Aboriginal Archaeological Assessment of the Proposal site in 2016 (Artefact, 2016). Artefact identified the Proposal site as having a low potential to contain intact archaeological deposits and no further investigation was recommended.

Online searches of the NSW State Heritage Register, s.170 State agency heritage registers, ALEP 2010 and BLEP 2015 revealed two non-Aboriginal archaeological sites in the locality of the Proposal site:

- Site of Royal Arms Inn
- Site of Speed the Plough Inn.

Details of these archaeological sites are included in Table 16-1.

16.3.3 Site characteristics

The Proposal site consists of an established levelled earthworks pad; raised above the 1-in-100 year flood event level and an existing formalised access driveway for heavy vehicles. Adjacent to the Proposal site are other components of the Chullora RRP including, but not limited to, a flood detention basin, stormwater infrastructure, a future development area, existing site office and carpark.

Since the most recent investigation (Artefact, 2016) of the Chullora RRP for non-Aboriginal heritage items significant landform alteration works have been conducted within the site, subsequently reducing the likelihood of intact non-Aboriginal heritage items being present.

16.3.4 Non-Aboriginal heritage items and conservation areas

A search of the EPBC Act Protected Matters Search Tool and National Heritage register revealed that there were no items of national heritage significance within a 1.5 km radius of the Proposal site.

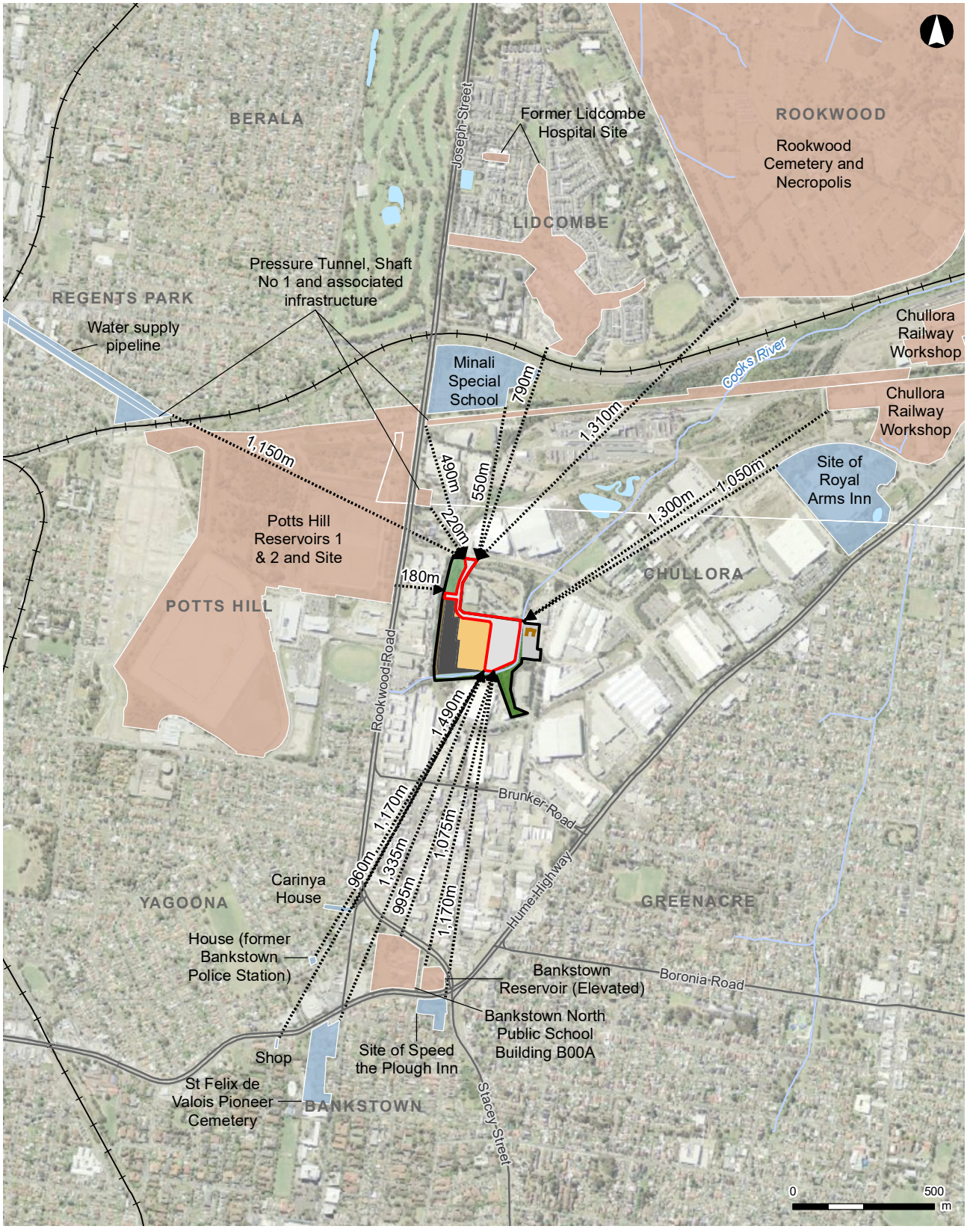
Online searches of the NSW State Heritage Register, s.170 State agency heritage registers, ALEP 2010 and BLEP 2015 revealed several state and locally listed heritage items and conservation areas within the locality of the Proposal site. The details of these non-Aboriginal heritage items and conservation sites are included within Table 16-1 and their locations depicted in Figure 16-1.

No non-aboriginal heritage items were identified within, or immediately adjacent, to the Proposal site.

Table 16-1 Items of state and local heritage significance within one km of the Proposal site

Item Name	Item Number	Address	Property Description	Distance from Proposal site	Significance
Heritage Items					
"Carinya" House	I39	50 Rookwood Road, Yagoona, NSW 2199	Lot C, DP 365541	960 m	Local
Bankstown North Public School Building B00A	N/A	322 Hume Highway, Bankstown, NSW 2200	N/A	995 m	State
Bankstown Reservoir (Elevated)	01316 (State Heritage Register number) 01630 (s. 170 NSW State agency heritage register)	Beresford Avenue, Bankstown, NSW 2200	Lot 1, DP 744542	1075 m	State
Chullora Railway Workshops	4801108	Beaufort Place, Chullora, NSW 2190	-	1300 m	s.170 Register (RailCorp)
House (former Bankstown Police Station)	I38	76 Powell Street, Yagoona, NSW 2199	Lot 5, DP 25154	1170 m	Local
Minali Special School (early twentieth century residence)	I36	169 Joseph Street, Lidcombe, NSW 2141	Lot 4, DP 1046678	550 m	Local
Potts Hill Reservoirs 1 and 2 and site	01333	146 Rookwood Road, Chullora, NSW 2190	Lot 107, DP 1153671	180 m	State
Pressure Tunnel, Shaft No 1 and associated infrastructure	01334 (NSW Heritage Register number) 01630 (LEP and Heritage Register number number)	189 Rookwood Road, Chullora, NSW 2190	Lot 1446, DP 132224	220 m	State
Rookwood Cemetery and Necropolis	00718 (State Heritage Register number)	East Street, Lidcombe, NSW 2141	Lot 7, DP 46563 Lot 490, DP 48319	1310 m	State

Item Name	Item Number	Address	Property Description	Distance from Proposal site	Significance
	A00718 (LEP Register number number)		Lot 492, DP 48441		
Shop (former Brancourt's Garage and Motor Showroom)	I37	401 Hume Highway, Yagoona, NSW 2199	Lot D, DP 392202	1490 m	Local
St Felix de Valois Pioneer Cemetery	I8	347A Hume Highway, Bankstown, NSW 2200	Lot 1, DP 1151149	1335 m	Local
Water supply pipeline	A59	Lidcombe, NSW 2141	N/A	1150 m	Local
Heritage Conservation Area					
Former Lidcombe Hospital Site	C07144	Joseph Street, Lidcombe, NSW 2141	Multiple Lots	790 m	State
Archaeological Sites					
Site of Royal Arms Inn	A2	2-2A Hume Highway, Chullora, NSW 2190	Lot 12, DP 834734; Lot 1, DP 547215	1050 m	Local
Site of Speed the Plough Inn	A1	321 Hume Highway, Bankstown, NSW	N/A	1170 m	Local



LEGEND

- Chullora RRP site boundary
- Proposal site
- Future stage
- Flood detention basin
- Established earthworks
- Existing car parking area
- Existing site office
- Cooks River stormwater canal
- Landscaping area
- Vegetated area
- Major road
- Railway
- Watercourse
- Local heritage item
- State heritage item

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Coordinate System: GDA 1994 MGA Zone 56
Date issued: August 4, 2020
Aerial imagery source: NSW LPI

1:20,000 at A4

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Figure 16-1: Non-Aboriginal heritage items within 1500m of the Proposal site

16.4 Construction impacts

No direct construction impacts would occur as a result of the Proposal. Possible indirect impacts could include:

- **Visual impacts:** Due to the topography of the Proposal site and surrounding area, and the intervening land uses it is considered highly unlikely that any construction activities associated with the Proposal would be visible from any non-Aboriginal heritage items. The erection of the MRF building would require the use of cranes / cherry pickers which would extend vertically from the site and may be temporarily visible from neighbouring areas.

  The closest non-Aboriginal heritage item, the *Potts Hill Reservoirs 1 and 2 and site*, however, it would be highly unlikely to have view lines to the Proposal site due to the topography and intervening land uses. Namely, between the *Potts Hill Reservoirs 1 and 2 and site* and the Proposal site is a petrol station and fuel container storage depot. The depot has fuel tanks stored in stacks up to four high, screening the Proposal site from the *Potts Hill Reservoirs 1 and 2 and site*. Visual screening is also provided within the boundary of the *Potts Hill Reservoirs 1 and 2 and site* in the form of a vegetated bund located between the site and Rockwood Road. Visual impacts would be negligible.

- **Noise and vibration impacts:** Section 11.4 notes that no vibratory plant and equipment would be used during the construction of the Proposal. Further the closes non-Aboriginal heritage item is located 180 m away from the Proposal site making vibration impacts highly unlikely. The *Potts Hill Reservoirs 1 and 2* is located within the road network identified for the Proposal (refer 7.3.1). The road noise impact assessment completed for the Proposal (described in Section 11.5.3) concluded that the Proposal would have a negligible impact on road noise levels in construction and operations.

16.5 Operation impacts

No direct operation impacts would occur as a result of the Proposal. Possible indirect impacts could include:

- **Visual impacts:** Based on the Proposal site topography, height of the MRF building (refer Section 4.3.1) and location of surrounding industrial buildings, it is not anticipated that the Proposal would be visible from any of the non-Aboriginal heritage items identified in Section 16.3.4.

  As noted above the closest non-Aboriginal heritage item, and the item with the greatest potential to have visibility of the Proposal site, would be the *Potts Hill Reservoirs 1 and 2 and site* located approximately 180 m to the west of the Proposal site. The eastern boundary of the Potts Hill Reservoirs is characterised by a raised earthen bund shielding the property from Rockwood Road (both from noise and visual impacts). Industrial properties are located between the Proposal site and the Potts Hill Reservoirs, including a petrol station and other warehouse buildings. Based on the topography and intervening land uses, the MRF would not be visible from the *Potts Hill Reservoirs 1 and 2 and site*.

- **Noise impacts:** The *Potts Hill Reservoirs 1 and 2* is located within the road network identified for the Proposal (refer 7.3.1). The road noise impact assessment completed for the Proposal (described in Section 11.5.3) concluded that the Proposal would have a negligible impact on road noise levels in construction and operations.

Clause 5.10 of the BLEP 2015 outlines the objectives for heritage conservation within the Canterbury-Bankstown LGA. The majority of the requirements under Clause 5.10 are related to development that would likely have a direct or significant impact on a heritage item and are therefore not applicable to the Proposal. An assessment of the Proposal's compliance with the objectives of Clause 5.1 is provide in Table 16-2.

Table 16-2 Proposal's consistency with Clause 5.10 of the BLEP 2015

Objective	Proposal's consistency with the objective
(1) **Objectives** The objectives of this clause are as follows: a. To conserve the environmental heritage of Bankstown	The Proposal would have no direct impact to any known environmental heritage items
b. To conserve the heritage significance of heritage items and heritage conservation areas, including associated fabric, settings and views	The Proposal site would not be visible from any heritage items or heritage conservation areas Any indirect impacts to heritage items associated with the Proposal are considered likely to be negligible
c. To conserve archaeological sites	The Chullora RRP site has a long history of land disturbance and industrial use dating back to the 1920s. The Chullora RRP site has been redeveloped on multiple occasions making the likelihood of archaeological sites remaining onsite very low. Notwithstanding mitigation measures in the case on unexpected finds of significant archaeological sites have been presented in Section 16.6.
d. To conserve Aboriginal objects and Aboriginal places of heritage significance	An assessment of the potential impact of the Proposal on Aboriginal heritage items is presented in Chapter 15 and Appendix Qo f this EIS

16.6 Mitigation measures

No direct impacts are proposed to non-Aboriginal heritage items or sites of significance. Indirect impacts (visual, noise and vibration) on any items or sites would be negligible. Mitigation measures that will be implemented to minimise impacts to unexpected non-Aboriginal heritage items finds are presented in Table 16-3 .

Table 16-3 Mitigation measures (non-Aboriginal heritage items and sites of significance)

ID	Mitigation measures	Timing
NAH1	An unexpected finds protocol will be prepared and included in the CEMP and OEMP. This protocol will outline the procedure for managing the identification of items of potential non-Aboriginal heritage significance during construction and operation. This protocol will include the following requirements: • Works in the vicinity of the item will be required to cease • EES Group will be immediately informed to determine the appropriate management strategy • Should items need to be disturbed (exposed, moved, damaged or destroyed), this will not be undertaken until an excavation permit is received under Section 139 of the *Heritage Act 1977.*	Construction and operation

ID	Mitigation measures	Timing
	The duration of this will depend on the integrity and significance of the heritage item.	

Conclusion

An assessment has been carried out to identify the potential for the construction and operation of the Proposal to impact on non-Aboriginal heritage items identified on State and Federal registers and databases.

The Proposal site does not contain any registered items of non-Aboriginal heritage significance and no direct impacts are anticipated as a result of the Proposal. Seven items of non-Aboriginal local and state heritage significance are located within one km of the Proposal site; however, none are within close proximity (less than 150 m) of the Proposal site, making indirect impact (visual, noise and vibration) negligible.

Should the Proposal interact with undiscovered heritage items of significance it is recommended that construction works, or operations cease and the item be assessed by a suitably qualified person. The DPIE would be subsequently notified to determine the appropriate management strategy for the heritage item.

17 GREENHOUSE GAS EMISSIONS

Summary

Katestone have prepared a Greenhouse Gas (GHG) Impact assessment to assess the greenhouse gas (GHG) impacts associated with the Proposal (Appendix R). The GHG Assessment has been prepared in accordance with the following guidelines and regulations:

- The National Greenhouse Accounts, August 2019 (Commonwealth of Australia, 2019a)
- *National Greenhouse and Energy Reporting Regulations 2008*
- *National Greenhouse and Energy Reporting (Measurement) Determination 2008*
- The Greenhouse Gas Protocol (World Resources Institute/World Business Council for Sustainable Development, 2004).

GHG emissions that would be generated by the Proposal have been assessed as either Scope 1 (direct) or Scope 2 (indirect) emissions and quantified in relation to carbon dioxide (CO_2) and other non-CO_2 GHG emissions (reported together as carbon dioxide equivalents (CO_2-e)).

Emissions associated with construction of the MRF are primarily associated with the use of diesel fuel within construction plant and equipment. Due to the limited duration and intensity of construction, these emissions are considered negligible.

The operation of the Proposal would generate emissions from:

- Diesel use:
  - Transport of incoming and outgoing materials
  - Haulage of processed materials / products
  - Materials handling equipment (e.g. forklifts).
- Electricity use associated with the operation of the MRF.

The operation of the Proposal would generate approximately 4,644 tCO_2-e, with 93.7 per cent of these emissions attributed to the electricity requirements of the MRF. In total, the Proposal would contribute approximately 0.0008 per cent to Australia's GHG emissions inventory total and 0.032 per cent to NSW's GHG emissions inventory total annual emissions. This does not represent a significant impact on a state or national scale.

While the estimated emissions associated with the Proposal are not considered significant, mitigation measures will be employed where possible to minimise the emission of GHG where feasible.

17.1 Introduction

Katestone have undertaken an assessment of the potential greenhouse gas (GHG) emissions that would be produced by the Proposal to address the SEARs issued by DPIE. The GHG Assessment for the Proposal is provided in Appendix R of this EIS. Table 17-1 provides a summary of the relevant SEARs which relate to traffic and access, and where these have been addressed in this EIS.

Table 17-1 SEARs (greenhouse gas)

SEARs	Where addressed
Air Quality and odour	
A greenhouse gas assessment	Chapter 17 Appendix R GHG Assessment

17.2 Methodology

The scoping and quantification of GHG emissions for the Proposal have been based on the following guidelines and regulations:

- The National Greenhouse Accounts, August 2019 (Commonwealth of Australia, 2019a)
- *National Greenhouse and Energy Reporting Regulations 2008*
- *National Greenhouse and Energy Reporting (Measurement) Determination 2008*
- The GHG Protocol (World Resources Institute/World Business Council for Sustainable Development, 2004)

Under the GHG Protocol, a Proposal's direct and indirect emissions sources can be delineated into Scope 1, Scope 2 and Scope 3 emissions. Scope 3 emissions are not reportable under the *National Greenhouse and Energy Reporting Act 2007* (NGER Act) and have not been considered within this assessment. The scope GHGs assessed for the Proposal, and their definition therefore comprise:

- **Scope 1 emissions:** being those GHG emissions released into the atmosphere as a direct result of an activity associated with the Proposal (e.g. fuel combustion within onsite plant and equipment)
- **Scope 2 emissions:** being those GHG emissions released into the atmosphere as a direct result of one or more activities that generate electricity, heating, cooling or steam that is consumed by the facility but that do not form part of the facility (e.g. electricity consumed within the MRF).

Quantification of potential emissions from the Proposal has been undertaken in relation to carbon dioxide (CO_2) and other non-CO_2 GHG emissions, including methane (CH_4), and nitrous oxide (N_2O). All emissions are reported as carbon dioxide equivalents (CO_2-e).

17.3 Existing environment

Under the NGER Act, SUEZ has been required to submit a National Greenhouse and Energy Report (NGER report) annually. Based on recent reporting periods, SUEZ will have ongoing reporting obligations under the NGER scheme that will need to include GHG emissions associated with Proposal related activities.

GHG emissions from SUEZ' controlled facilities contribute to State and National GHG inventories. A summary of NSW' and Australia's most recently published GHG emissions inventories including GHG emission categories relevant to the Proposal are provided in Table 17-2Table 17-2 Summary of GHG emissions for Australia and New South Wales – 2017 (Commonwealth of Australia, 2019b).

Table 17-2 Summary of GHG emissions for Australia and New South Wales – 2017

Category	Australia	New South Wales	
	Emissions ($MtCO_2$-e)	Emissions ($MtCO_2$-e)	Contribution to national emissions
Inventory Total	554.1	144.1	26.0%

17.4 Construction impacts

The construction phase of the Proposal is anticipated to occur over a 12 month period. GHG emissions during construction would be primarily related to the combustion of diesel fuel for construction equipment and the haulage of construction materials for the construction of the MRF (refer Section4.4). Due to the limited nature of construction, these emissions are considered minor and insignificant.

17.5 Operation impacts

The operation of the Proposal would generate Scope 1 and Scope 2 emissions from the following activities:

- Diesel use:
  - Transport of incoming waste
  - Haulage of processed materials/products
  - Materials handling equipment (e.g. forklifts).
- Electricity use for the operation of the MRF (e.g. associated with use of lighting, ventilation and fixed plant).

Emissions from diesel use have been estimated for the ongoing operation of mobile plant and equipment (refer Section 4.5.2). Diesel would also be consumed by heavy vehicles accessing the Proposal site to drop off or collect materials. These vehicles would predominantly be owned and operated by SUEZ and are considered likely to already be accounted for in SUEZ' annual NGER. Consequently, diesel combustion by heavy vehicles has only been assessed for the duration that they are directly within the RRP boundary.

A summary of estimated annual GHG emissions, alongside energy consumption associated with the operations phase of the Proposal, is provided in Table 17-3 below. The Proposal would consume electricity to operate fixed plant and machinery, as well as to power the MRF building (e.g. lighting, ventilation and air conditioning within the office). The annual electricity requirements for the MRF are estimated to be 5,371,184 kilowatt hours per year (kWh/y). The operation of the MRF would generate approximately 4,644 tCO_2-e. The vast majority of these annual GHG emissions are attributed to the electricity requirements of the MRF (93.7 per cent).

Table 17-3 GHG emissions generated from operation of the Proposal (tCO_2-e per annum)

Emissions source	Energy use (GJ)	Scope	Emissions (tCO_2-e)
Diesel use	4,160 (18.0%)	1	293 (6.3%)
Electricity	19,336 (82%)	2	4,351 (93.7%)
TOTAL	**23,496**	**1 + 2**	**4,644**

The Proposal would contribute approximately 0.0008 per cent to Australia's annual GHG emissions inventory total and 0.032 per cent to NSW's annual GHG emissions inventory total. This does not represent a significant impact on a state or national scale.

The maximum annual GHG emissions and energy use associated with the Proposal does not meet the NGER program facility thresholds of 25 $ktCO_2$-e or 100 terajoules (TJ) of energy. SUEZ would be required to report annual GHG emissions and energy use for the Proposal as a component of its annual corporate NGER obligations. While not quantified in this EIS, the Proposal would contribute to the abatement of emissions through the diversion of waste from landfill and promotion of a circular economy.

17.6 Mitigation measures

GHG emissions produced by the Proposal are anticipated to be minor. Mitigation measures that will be implemented to minimise impacts to further minimise GHG impacts are presented in Table 17-4.

Table 17-4 Mitigation measures (greenhouse gas emissions)

ID	Mitigation measures	Timing
GG1	A CEMP and OEMP, or equivalent, will be prepared for the Proposal to minimise GHG emissions impacts and will include the following: • Inclusion of energy efficiency design aspects, where practicable, in order to reduce energy and fuel consumption • Machinery selection considerations. Fuel efficiency of the construction plant and equipment will be assessed prior to selection, and where practical, equipment with the highest fuel efficiency and which uses lower GHG intensive fuel (e.g. biodiesel) will be used • Factors for considerations for the use of energy-efficient lighting and energy-efficient appliances.	Construction and operation

Conclusion

Katestone have undertaken an assessment of the GHG emissions associated with the Proposal. Impacts during construction are expected to be minimal due to the short construction timeframe and limited nature of the works (e.g. no earthworks). Impacts during the operation of the Proposal would be primarily generated from the electricity requirements of the MRF and the combustion of diesel fuel from plant and equipment within the Proposal site boundary.

The assessment found that the estimated annual GHG emissions from the Proposal is 4,644 tCO_2-e, which is not considered significant either in the context of NSW or Australia's emissions profiles.

18 VISUAL AMENITY

Summary

In accordance with the SEARs, a visual impact assessment was undertaken to assess the potential visual amenity impacts of the Proposal during both construction and operation.

The visual impact assessment included the following steps:

1. Viewpoint identification
2. Site inspection
3. Assessment of visual impact.

The Proposal site is set within an established industrial landscape which is bounded by the residential communities of Yagoona to the south-west and Greenacre to the south and east. Rookwood Road and the Hume Highway separate the residential communities from the industrial precinct. Potts Park, west of the Proposal site, is the only recreational area in the vicinity of the Proposal site.

Eight potential viewpoints were identified and photographs from each of these locations were captured during a site inspection undertaken on 14 January 2020. The visual impact of the Proposal at the eight identified viewpoints was assessed against three criteria:

- Visual sensitivity - susceptibility of a view to accommodate change without losing valued attributes
- Magnitude – extent of change experienced by visual receivers
- Visual impact - result of the magnitude and the visual sensitivity rating.

During construction, there is potential for some construction equipment to be visible from five viewpoint, none of which are from residential areas. Due to the temporary nature of the construction works and the surrounding industrial land uses, it is unlikely that visual impacts would be overly intrusive.

During operation of the Proposal, there is potential for the site elements to be visible from viewpoints 6 and 7 which are located along Muir Road and would therefore provide transient viewpoints. However, due to the industrial character of the area any introduction of industrial elements to the Proposal site would not result in a material change to the visual amenity in this area. The material and finishes used on the structures of the Proposal would ensure that the Proposal would blend into the surrounding landscape. The Proposal was assessed as having a 'negligible impact' at all viewpoints.

Mitigation measures will be implemented during construction and operation of the Proposal to minimise any potential visual amenity related impacts.

18.1 Introduction

This section includes an assessment of the key visual impact-related issues identified for the Proposal, including construction and operation impacts to address the SEARS issued by DPIE. Table 18-1 provides a summary of the relevant SEARs which relate to visual amenity, and where these have been addressed in this EIS.

Table 18-1 SEARs (visual)

SEARs	Where addressed
Visual	
The EIS must address the following specific matters: • **Visual** - Including an assessment of the potential impacts of the development on the amenity of the surrounding area. The assessment should include	Sections 18.4 and 18.5 Architecturals are provided in Appendix E which provide a visual representation of the MRF.

SEARs	Where addressed
images and photomontages of the proposed MRF building, and details of the height, colours, scale, building materials and finishes, signage and lighting	

18.2 Methodology

The visual impact of the Proposal was assessed via the following key steps:

1. **Viewpoint identification:** A review of the applicable guidelines and a desktop analysis of the surrounding area was undertaken to identify areas that would be potentially subject to visual impacts as a result of the Proposal. Based on this assessment, viewpoints were selected and are identified further in Table 18-4 and Figure 18-1.
2. **Site inspection:** Through a site inspection, the relevance of the locations identified in the previous step could be validated. Photographs were taken from key viewpoints and are presented in Table 18-4.
3. **Assessment of visual impact:** The visual impact from the key viewpoints was then assessed qualitatively on the basis prescribed assessment criteria. This included identification of the sensitivity of the viewer and the magnitude of the modification to the view created by the Proposal.

The visual impact of the Proposal was assessed using a range of criteria against which the relative importance of each observer location was determined, including:

- Context and visual setting
- Site elements
- Site character
- Adjacent development and surrounding land use
- Distance to view (foreground, middle-ground and background)
- Visual prominence of the development
- Potential changes to the view setting
- Category of viewer (e.g. resident, works, shopper, open space user)
- Importance of the view including consideration of perceived cultural and historical values.

For each viewpoint, these criteria were addressed under three categories, described in Table 18-2 below.

Table 18-2 Visual impact assessment criteria

Criteria	Description
Visual sensitivity	Visual sensitivity refers to the susceptibility of a view to accommodate change without losing valued attributes. The values of a view refer to any aspect of landscape or views people consider to be important. Visual sensitivity depends on the distance between the viewer and a development, the category of the viewer (e.g. resident, worker, open space user) and the importance of the view (e.g. is it a view people deliberately seek out). In general views can be classified as: • High sensitivity – views considered of high importance (e.g. public look-out spots) with a sustained duration of view and close proximity or high prominence of view • Moderate sensitivity – views considered of moderate importance, but the duration of views, number of viewers and proximity to view are lower than the surrounding area (residential communities with direct view) • Low sensitivity – views of low significance or with low duration of and large distance to viewpoint (e.g. motorists focussed on driving) • Negligible sensitivity – views of no significance and are isolated and not utilised by many viewers (e.g. industrial areas with employees focussed on work).

Criteria	Description
Magnitude	The magnitude of visual change refers to the scale of the project and the extent and proximity of the view to it. The four levels of magnitude used in the assessment are as follows: • High magnitude – considerable or uncharacteristic modification to the visual setting • Moderate magnitude – prominent but not substantially uncharacteristic modification to the visual setting • Low magnitude – minimal alteration and modification consistent with the existing visual setting • Negligible magnitude – no discernible change to the existing visual setting.
Visual impact	The visual impact is a result of the visual modification and the visual sensitivity and is summarised on a qualitative basis. The resulting overall visual impact rating for each viewpoint was then determined using the assessment matrix presented in Table 18-3 below.

Table 18-3 Overall impact rating as a combination of visual sensitivity and visual adaption

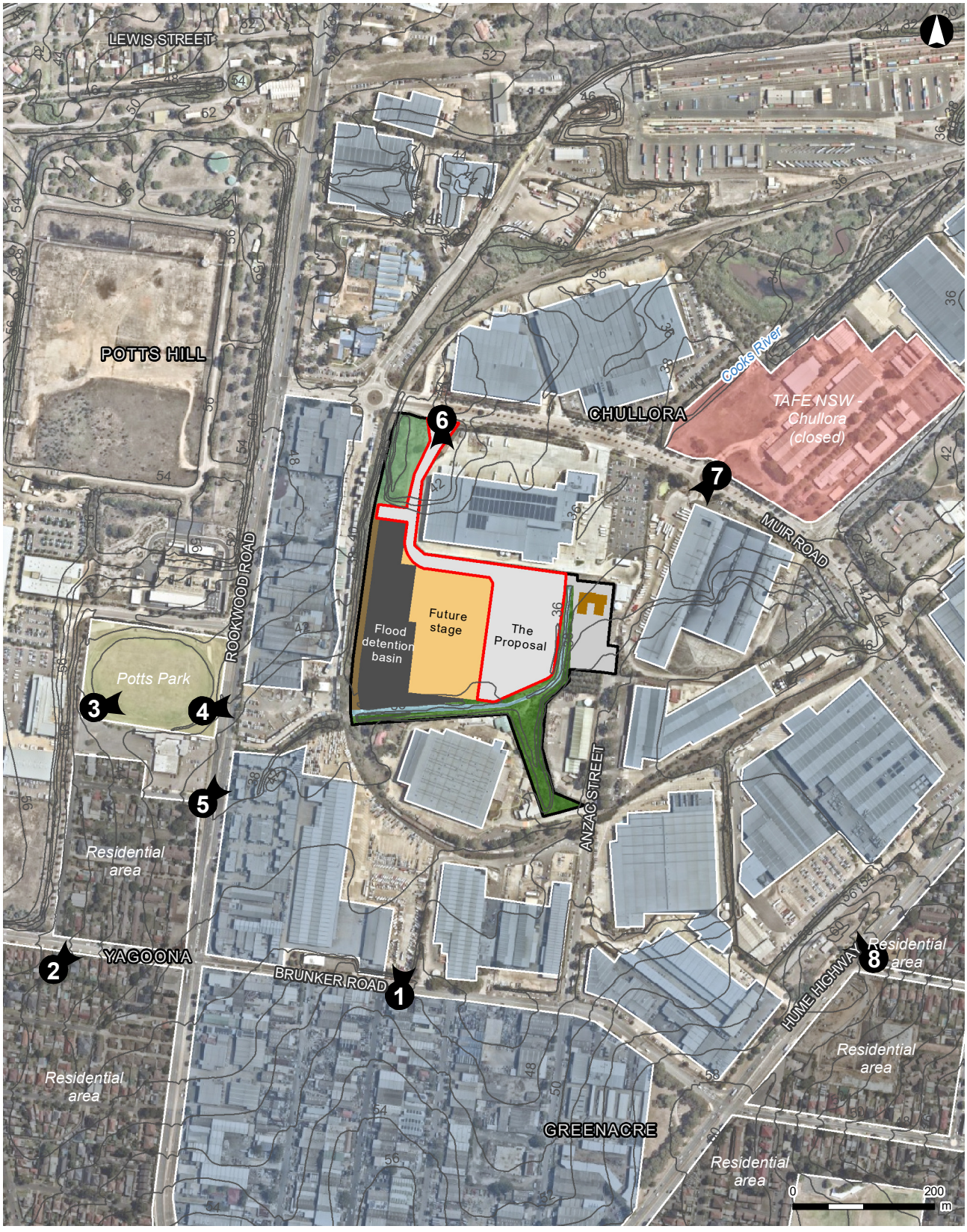
		Magnitude			
		High	Moderate	Low	Negligible
Visual sensitivity	High	High	High-moderate	Moderate	Negligible
	Moderate	High-moderate	Moderate	Moderate-low	Negligible
	Low	Moderate	Moderate-low	Low	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

The viewpoint locations selected for the visual impact assessment are identified in Table 18-4 and displayed in Figure 18-1.

Table 18-4 Viewpoint locations

Viewpoint ID	Location	Type
View 01	South of site, corner of Beresford Avenue and Brunker Road, Yagoona	Industrial/Residential
View 02	Southwest of site, Corner of Powell Street and Brunker Road, Greenacre	Residential
View 03	West of site, Potts Park	Public Space
View 04	West of site, Potts Park (adjacent to Rookwood Road)	Public Space
View 05	South-west of site, corner of Boardman Road and Rookwood Road, Yagoona	Residential
View 06	Site entrance, Muir Road	Industrial
View 07	North-east of site. entrance to Chullora TAFE, Muir Road	Public Road/Industrial

Viewpoint ID	Location	Type
View 08	South east of site, corner of Northcote Road and Hume Highway (adjacent to 225-241 Hume Highway – Eden Greenacre, a mixed use development under construction)	Public Road/Residential



LEGEND

- Chullora RRP site boundary
- Proposal site
- Future stage
- Flood detention basin
- Established earthworks
- Education facility
- Industrial receiver
- Recreational area
- Sensitive residential receiver
- Existing car parking area
- Existing site office
- Cooks River stormwater canal
- Landscaping area
- Vegetated area

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Coordinate System: GDA 1994 MGA Zone 56
Date issued: August 4, 2020
Aerial imagery source: nearmap Jan 2020

1:8,000 at A4

ARCADIS

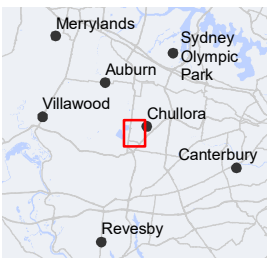


Figure 18-1: Viewpoint locations

18.3 Existing Environment

The Proposal site is situated within the Chullora RRP site, located in the suburb of Chullora, approximately 18 km west of the Sydney CBD and 10 km east of the Parramatta CBD within the Cooks River Catchment area.

The Proposal site is set within an undulating landscape, adjacent to the Cooks River which runs along the southern and eastern boundary (refer to Figure 18-1) and comprises a 2.5 ha developable area for the construction and operation of the proposed MRF; internal roads; and supporting infrastructure.

The Proposal site is located within the Chullora Technology Park, an established industrial precinct, that includes:

- Food storage facilities
- Freight and logistics operations
- Resource recovery transfer stations
- Steel and sheet metal manufacturers
- Offices and business park developments
- Fuel stations.

Buildings within the vicinity of the Proposal site are approximately 10-15 m in height, with large development footprints and wide access points for heavy vehicles, particularly along Muir Road. The surrounding road network includes the Hume Highway, located approximately one km east of the site via Muir Road, and Rookwood Road, located approximately 200 m west of the site via Muir Road. These roads are key arterial connections to areas within the Greater Sydney area and are heavily utilised by both heavy and light vehicles.

The Sydney Freight Terminal operated by Pacific National and associated rail infrastructure is located approximately 700 m north of the Proposal site. The disused rail siding, which is located approximately 150 m west of the Proposal site, links into this terminal facility and into the greater freight rail network. Adjacent to this site is the RSPCA Sydney Veterinary Hospital.

The area to the south of Brunker Road located approximately 380 m south of the Proposal site is a light industrial precinct consisting of small warehousing facilities and mechanical repair workshops.

A number of residential suburbs are located in proximity to the Proposal site. The approximate distances of these suburbs to the Proposal site are provided in Table 18-5 below.

Table 18-5 Distance of residential suburbs to the Proposal site

Suburb	Distance from Proposal site
Regents Park	600 m northwest
Greenacre	600 m east
Bankstown	1100 m south
Yagoona	455 m southwest
Potts Hill	960 m west

Potts Park is located approximately 350 m west of the Proposal site and is used for recreational activities including greyhound racing. Immediately adjacent to Potts Park is the Sydney Water Field Operations Facility and Potts Hill Reservoirs (listed on the State Heritage Register – refer Section 16.3.4).

The character of the area is strongly influenced by the surrounding industrial precinct, residential areas and the major arterial roads and rail networks. The residential suburbs of Yagoona and Greenacre are separated from the industrial precinct by Rookwood Road and the Hume Highway, respectively.

Based on the surrounding landforms and land uses, the key potential areas where the Proposal may be visible from are:

- Areas within the Chullora Technology Park
- Residential areas in Yagoona to the south-west of the Proposal site
- Residential areas in Greenacre to the south and east of the Proposal site
- The Potts Park area to the west of the Proposal site.

18.4 Construction impacts

Construction works may be visible from surrounding viewpoints. The most visible elements would likely be equipment such as cranes, cherry pickers and forklifts used during the erection of the MRF. These have the potential to be visible at viewpoints 1, 3, 4, 6 and 7 – none of which are located within residential area. Given the low-rise nature of construction works and surrounding industrial land uses, it is unlikely that these works would be overly intrusive and visual impacts would be localised and temporary in nature.

The visual impact assessment for both construction and operation of the Proposal is presented in Table 18-7. The Proposal has been assessed as having an 'negligible impact' at all viewpoints.

18.5 Operation impacts

The industrial precinct and general pattern of industrial type development surrounding the Proposal site effectively screens the Proposal site from much of the nearby residential and recreational areas. Vegetation located along Muir Road, Brunker Road and Rookwood Road provide further screening for the surrounding sensitive areas. Further, the proposed MRF would be of a similar size and scale to the MRF that formed part of the previous Chullora RRC prior to its demolition in 2017. Any views to the MRF would therefore likely be commensurate with those experienced by receivers dating back to the mid-1990s.

Potential views would occur along viewing corridors on Muir Road (viewpoints 6 and 7) where the heavy vehicle site access is located. These viewpoints allow for potential visibility of the top of the MRF building, operational equipment and operational area at the west of site. However, due to the industrial character of the area any introduction of industrial elements, and the transient nature of these viewpoints (i.e. they are experienced by moving motorists), associated with the Proposal would not change the visual amenity in this area. The MRF will be designed to a high quality to blend into the surrounding industrial environment. Architectural designs are provided in Appendix E, and a visualisation of the MRF from the eastern perspective is shown in Figure 18-2. Table 18-6 provides an indicative list of the materials and finishes that will be used on these structures.

Table 18-6 Materials and finishes

Infrastructure	Item	Indicative materials	Indicative colour palate
MRF building	Roof	Metal sheeting	Mix of navy blue and grey Colorbond cladding with painted charcoal concrete tilt up walls
	Wall	Cladding	

Infrastructure	Item	Indicative materials	Indicative colour palate
Site entrances	Site entrance gate / wall	Timber appearance	Brown
Muir Road and Anzac Street entrances	Signage	Metal	White with SUEZ logo
	Landscaping	Native trees and shrubs	-



Figure 18-2 Visualisation of MRF

The visual impact assessment for the Proposal site for both construction and operation of the Proposal is presented in Table 18-7 below. The Proposal has been assessed as having a ‘negligible impact’ at all viewpoints.

Table 18-7 Visual impact assessment

Viewpoint	View
Viewpoint 1	
Negligible sensitivity This viewpoint includes an industrial streetscape, defined by large screened security fences and storage warehouse facilities (apparent below the sightline of the fence). The four lane Brunker Road includes wide access and egress points to accommodate large trucks and machinery. Most users of the area would be travelling through an established industrial precinct, only being exposed for a short period of time. **Negligible magnitude** The character of the construction activity would be largely absorbed into the surrounding industrial character of the Chullora Technology Park. This would result in no perceived change in the amenity of this view. The MRF facility would not be visible due to the intervening warehouse facilities and viewing distance. Any inclusion of visible industrial elements would not be likely to change the existing landscape amenity. **Negligible impact** The Proposal would not be likely to be visible at this location. Any introduction of additional industrial elements to the Proposed site would not change the visual amenity in this area.	

Figure 18-3 Viewpoint 1

Viewpoint	View
Viewpoint 2	
Low sensitivity The viewpoint is located within the suburb of Yagoona which consists primarily of residential dwellings. The location is significantly elevated providing easterly views over the Chullora industrial area. The vegetation planted on the boundary of the Potts Hill Reservoir site provides visual separation between the industrial area and the Yagoona community. The viewpoint has been considered of low sensitivity given the significant distance to the industrial area and intervening obstructing vegetation and industrial uses	
Negligible magnitude The Proposal site would not be visible during both construction and operational phases due to the viewing distance and intervening vegetation.	
Negligible impact Despite the significant elevation of this viewpoint the Proposal site would not be visible from this location due to the screening provided by existing vegetation along Brunker Road	

Figure 18-4 Viewpoint 2

Viewpoint	View
Viewpoint 3	
Moderate sensitivity The view across Potts Park provides easterly views toward the Proposal site. This viewpoint is also located approximately 6 m higher than the Proposal site. The Park is of moderate sensitivity as it is a publicly accessible recreational area surrounded by mostly industrial land uses. **Negligible magnitude** The tops of construction equipment including cranes may be visible during construction. However, these would be temporary in nature and not highly intrusive. It is unlikely that the Proposal site would be visible from this viewpoint during operations due to the viewing distance and the intervening petrol station. The stacking of diesel tanks on the western boundary of the petrol station prevents any direct sightlines to the Proposal site. **Negligible impact** The Proposal site is not likely to be visible from this viewpoint and would not change the visual amenity in this area.	

Figure 18-5 Viewpoint 3

Viewpoint	View
Viewpoint 4	
Moderate sensitivity Potts Park is a publicly accessible recreational area within a largely industrial landscape. The existing infrastructure in the background lowers the visual sensitivity. Motorists would mostly focus on driving and would have a lower sensitivity, resulting in an overall moderate sensitivity rating for viewers. **Negligible magnitude** The tops of construction equipment including cranes could be visible during construction. However, these would be temporary in nature and not highly intrusive. It is unlikely that the Proposal would be visible from this viewpoint due to the height of the intervening diesel tanks and the low elevation of the Proposal site. **Negligible impact** The Proposal site is not likely to be visible from this viewpoint and would not change the visual amenity in this area.	

Figure 18-6 Viewpoint 4

Viewpoint	View
Viewpoint 5	
Negligible sensitivity This view is from the residential community of Yagoona toward the commercial precinct on the eastern side of Rookwood Road. This precinct includes a medical centre and solar panel wholesaler. The buildings in this precinct obstruct the views to the Proposal site from this location. **Negligible magnitude** During construction and operation, views to the Proposal site would be obstructed by the existing building elements. **Negligible impact** The Proposal would not be visible from this location. Therefore, there would be a negligible visual impact.	

Figure 18-7 Viewpoint 5

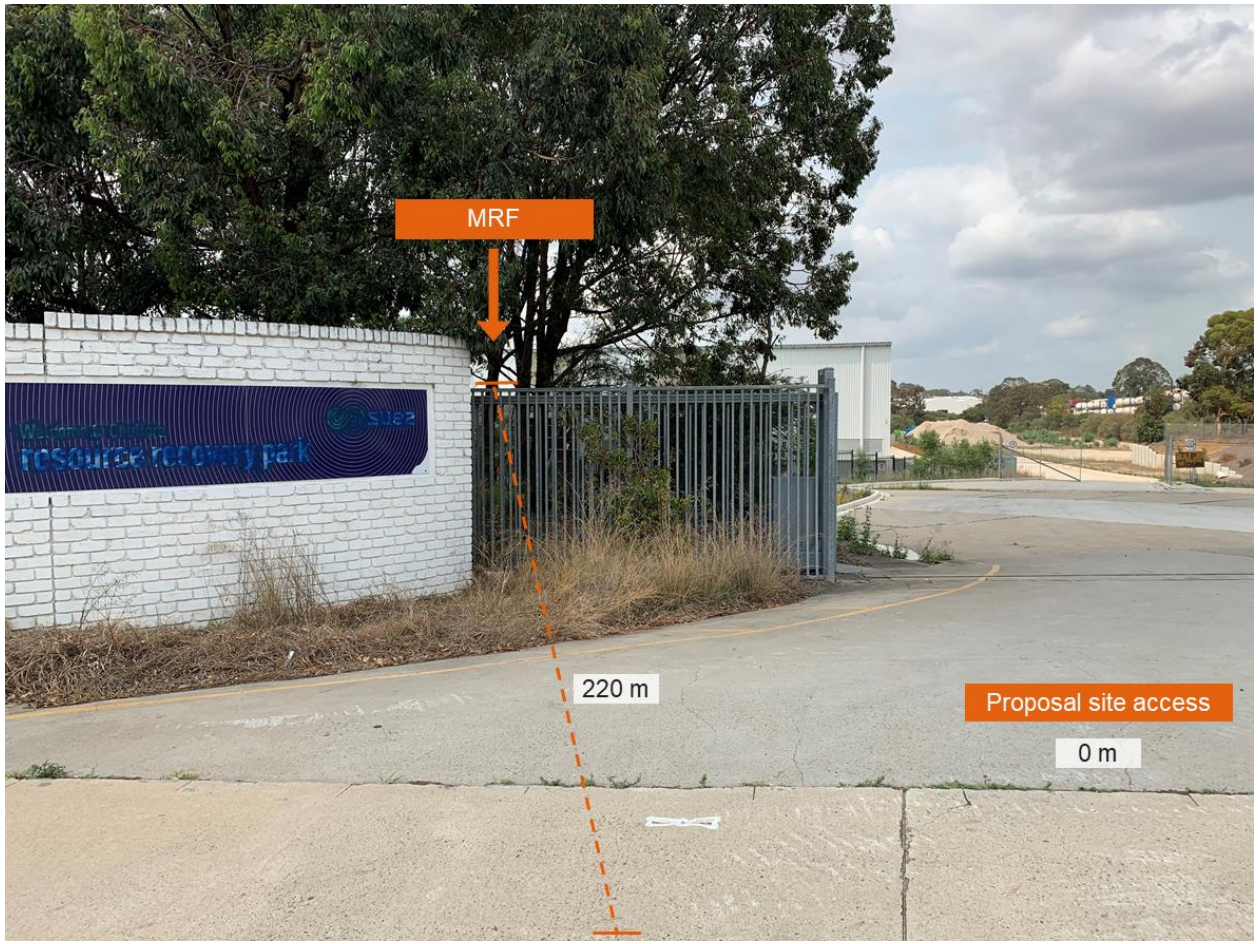
Viewpoint	View
Viewpoint 6	
Negligible sensitivity This viewpoint is from the site entrance off Muir Road, located within a larger established industrial area. The streetscape is defined by large scale storage and distribution warehouses and the Chullora TAFE facility. The street includes wide access and egress points to accommodate large trucks and machinery. **Negligible magnitude** This location has direct sight lines into the western portion of the Proposal site and therefore construction activities would be visible for the duration of construction. Much of the Proposal site is screened by the PFD Storage Warehouse. The surrounding built form and character would be consistent with the character of the Proposal. Trees and shrubs would also be provided along the Muir Road façade to filter views to the Proposal site. **Negligible impact** The Proposal would be partially visible from this location. However, due to the existing industrial amenity, any introduction of additional industrial elements would not change the visual amenity in this area. Furthermore, the viewpoint receivers are of an industrial nature, or from road users with low sensitivity.	

Figure 18-8 Viewpoint 6

Viewpoint	View
Viewpoint 7	
Negligible sensitivity This viewpoint is from the entrance to the Chullora TAFE facility, to the north-east of the Proposal site. The Tip Top bakery warehouse and site entrance is visible from this viewpoint and includes direct sight of the loading dock and truck parking area. Due to this and the TAFE facility not being active, this viewpoint has negligible sensitivity. **Negligible magnitude** Construction equipment including cranes and cherry pickers may be visible from this viewpoint. However, this will be temporary in nature and would be largely absorbed by the surrounding industrial precinct. The top of the MRF building may be partially visible from this location. The mass and scale of the Proposal site would not be apparent as much of the MRF and ancillary facilities would be obstructed by the existing intervening industrial buildings and vegetation planted along Muir Road. **Negligible impact** The Proposal would be partially visible from this location. However, due to the existing industrial amenity, any introduction of additional industrial elements would not change the visual amenity in this area.	

Figure 18-9 Viewpoint 7

Viewpoint	View
Viewpoint 8	
Moderate sensitivity This viewpoint is from the residential community of Greenacre toward the industrial area at Chullora. It is adjacent to Eden Greenacre which is a four-storey mixed commercial and residential development currently under construction. The view is slightly elevated and includes the Hume Highway and sparse vegetation in the middle ground. Warehouse facilities which form part of the Chullora Technology Park are present in the background. As the future residents of the Eden Greenacre development would be further elevated than the existing view, the sensitivity is considered moderate. **Negligible magnitude** It is unlikely that any construction equipment would be noticeable from this viewpoint due to the viewing distance and low elevation of the Proposal site. Future residents of the Eden Greenacre development may have views over the Chullora Technology Park. However, due to the viewing distance the MRF building would be obstructed by the intervening vegetation and warehousing facilities. **Negligible impact** The Proposal would not be likely to be visible at this location. Any introduction of additional industrial elements to the Proposed site would not change the visual amenity in this area.	

Figure 18-10 Viewpoint 8

18.6 Mitigation measures

The Proposal site has been determined to have a negligible impact on visual amenity within the locality. Table 18-8 outlines the mitigation measures that will be implemented by SUEZ to further minimise any landscape and visual amenity impacts.

Table 18-8 Mitigation measures (Visual amenity)

ID	Mitigation measures	Timing
VA1	A CEMP and OEMP, or equivalent, will be prepared for the Proposal to minimise landscape and visual amenity impacts and will include the following: • Locations for equipment and materials storage. All works equipment and material will be contained within designated boundaries of the Proposal site. Where possible, elements within the construction site will be located to minimise visual impacts, including: – Setting back large equipment from site boundaries – Minimising the height and spread of stockpiles, waste, and vehicle parking across the site – Site vehicles will be parked in appropriate locations • Cleaning protocols. Dust and dirt will be regularly cleaned from the road surface. Any graffiti will be promptly removed.	Construction and operation

Conclusion

A visual impact assessment was conducted to determine the potential impacts associated with the construction and operation of the Proposal on visual amenity in the local landscape. Desktop analysis of the surrounding area and review of the applicable guidelines was conducted to identify suitable locations to measure visual impacts from the Proposal. Site inspection was carried out to validate the relevance of the chosen locations for impact assessment.

The Proposal site has been determined to have a negligible impact on visual amenity within the locality. The Proposal site will only be visible from temporary user locations, no residential users are anticipated to be impacted. The Proposal site is shielded by intervening vegetation and other industrial buildings on all boundaries with direct line of sight being restricted to view corridors associated with the development.

19 WASTE MANAGEMENT

Summary

A desktop assessment has been carried out to identify the potential for the construction and operation of the Proposal to generate waste and associated impacts.

The waste impacts of the construction and operation of the Proposal are deemed to be minor and any impacts would be readily managed and reduced through the implementation of mitigation measures.

The construction phase of the Proposal would involve the construction of infrastructure, which would predominantly generate waste in the form of surplus building and packaging materials, and from construction personnel' amenities and lunchrooms.

During operation, waste would be generated through offices, amenities, lunchrooms, and maintenance of plant and equipment which would generate waste in the form of cardboard, plastics, fuels / oils and tool and equipment consumables.

Measures to mitigate the effect of the construction waste streams will be incorporated into the Proposal's CEMP and OEMP and would include best practice waste avoidance and waste management where practicable.

19.1 Introduction

This section includes an assessment of the potential waste related impacts associated with the Proposal to address the SEARs issued by DPIE. Table 19-1 provides a summary of the relevant SEARs which relate to waste, and where these have been addressed in this EIS.

Table 19-1 SEARs (waste)

SEARs	Where addressed
Waste management	
The EIS must address the following specific matters: **Waste Management** – details of the waste management strategy for construction and ongoing operational waste generated	Section 19.3 and Section 19.4

19.2 Existing environment

The existing environmental context for the Proposal site is described in Chapter 2 of this EIS. The Proposal site was historically associated with the former Chullora RRC which was subject to a fire in 2017 and subsequently demolished. The previous Chullora RRC would have produced minimal quantities of waste during its operation, including:

- Putrescible waste, including but not limited to mixed residual waste and general solid putrescible waste
- Non-putrescible solid waste, including but not limited to recyclable materials, packaging and discarded consumables
- Tool and equipment consumables
- Plant and equipment maintenance waste (e.g. oily rags, oil filters, tyres etc.).

Following the completion of the flood mitigation works (DA 366/2020) the Proposal site will comprise a raised earthworks pad. No activities will occur in this area and no waste will be generated.

19.3 Construction impacts

Waste generating activities, and their corresponding waste types, associated with the construction of the Proposal are listed in Table 19-2.

Table 19-2 Waste generating activities during construction

Waste generating activity	Waste classification	Waste/resource types
Utilities installation	General solid waste (non-putrescible)	• VENM / ENM • Surplus material from installation of utilities
Establishment of line marking, and installation of signage	General solid waste (non-putrescible)	• Surplus building materials
Construction and internal fit out of warehousing	General solid waste (non-putrescible)	• Surplus building materials • Surplus concrete and asphalt waste
Office administration, lunchroom and other activities	General solid waste	• General waste from site office including putrescibles, paper, cardboard, e-waste plastics, glass, site litter, cigarette butts and printer cartridges
Operation of plant and equipment	Hazardous waste, special waste, liquid waste	• Waste from operation and maintenance of construction vehicles and machinery including adhesives, lubricants, waste fuels, cleaning products and chemicals, and oils, engine coolant, batteries, hoses and tyres • Clean up waste in the event of an accidental spill of fuel or chemicals

The mismanagement of waste generated by the Proposal has the potential to result in the following impacts:

- Excessive materials being directed to landfill due to inadequate collection, reuse, and recycling
- Impacts to human health resulting associated with various types of waste being generated and stored on-site, with the potential for misclassification or mishandling resulting in potential cross contamination
- Environmental impacts from the incorrect storage, classification, transport and disposal of waste
- Traffic impact associated with the removal and transport of waste off-site.

The waste quantities anticipated to be generated would be very minor. Notwithstanding this waste streams would need to be managed appropriately to ensure minimisation of waste generation and avoid, where possible, transportation to landfill. Potential waste generated during construction would be managed using the waste hierarchy approach; whereby avoiding the generation of waste and reusing materials are prioritised over waste disposal. Should waste be found to be unsuitable for reuse or recycling, disposal methods would be selected based on the classification of the waste material in accordance with the Waste Classification Guidelines: Part 1 Classifying Waste (NSW EPA, 2014b). The Waste Classification Guidelines provide direction on the classification of waste, specifying requirements for management, transportation and disposal of each waste category.

Resource recovery will be applied to the management of construction waste and will include:

- Recovery of resources for reuse - reusable materials generated by the project will be segregated for reuse on-site, or off-site where possible, including the reuse of the major waste streams
- Recovery of resources for recycling - recyclable resources (such as metals, plastics and other recyclable materials) generated during construction will be segregated for recycling and sent to an appropriate recycling facility for processing.

The waste materials generated from construction of the Proposal would be managed as per the disposal methods listed in Table 19-3.

Table 19-3 Construction waste and disposal methods

Waste generated	Management method
Construction waste such as building materials, road base, asphalt and packaging waste	All materials that are potentially recyclable would be disassembled and removed carefully to maximise further reuse and recycling. To ensure diversion from landfill, waste materials would be clearly separated and stored temporarily on-site for reuse or removal to a recycling facility. Stockpiled materials would be monitored and maintained in accordance with the sites CEMP by the site's environment/waste management manager. Where possible, the amount of packaging waste would be minimised by avoiding the ordering of unnecessary or excess supplies and by buying in bulk. Where reasonable and feasible, cost-effective suppliers that use sustainable, recycled and / or recyclable material would be used. All packaging waste generated would be sorted for recycling or disposal at an approved facility. In the event of excess supplies due to accidental over-ordering or design changes, excess material would be reused, returned to the supplier or recycled where feasible.
Contaminated spoil	The, handling, storage, movement and disposal of waste material that is identified as being contaminated would be carried out in accordance with the procedures detailed in the unexpected finds protocol in the CEMP and in accordance with the *Work Health and Safety Regulation 2017* (NSW).
Hazardous materials	Any hazardous materials would be isolated and removed by a qualified handler for recycling or recovery of energy where possible.
Office administration, lunchroom other activities, and sewerage	All waste and recycling generated by the site offices would be source-separated into the following dedicated bins: • General waste • Co-mingled recycling The segregation of recyclables from the general waste stream would maximise resource recovery and minimise materials sent to landfill. All bins would be clearly labelled and coloured to reflect the correct stream. All staff would be trained about the internal office waste management system to ensure adequate understanding across all employees. Sewage waste would be discharged to Sydney Water sewerage infrastructure in accordance with Sydney Water requirements.
Clean up and liquid waste	Liquid waste could also be generated in the incident of a spill or leak. In these cases, quantities of liquid waste would be minimal. Liquid waste would be collected and transferred to a dedicated recycling facility where possible, to ensure diversion from landfill. Materials collected during clean up would be disposed of at an appropriately licensed facility.

19.4 Operation impacts

The Proposal would be unlikely to generate substantial quantities of waste with only limited volumes of waste associated with office and workforce activities as well as maintenance activities. The types of operational waste that would be generated, and the disposal method for each type, are presented in Table 19-4. The Proposal is expected to generate employment for 45 FTE employees who could be onsite at any given time during the operation of the Proposal. The volume of waste to be generated during operation are considered minor and it is also noted that operational waste types and quantities would be commensurate with those produced by the previous Chullora RRC.

Table 19-4 Operational waste and disposal methods

Waste generating activity	Waste classification	Waste / resource types	Disposal method
Administration, amenities and lunchrooms	General solid waste (putrescible)	Putrescible waste, including but not limited to mixed residual waste and general solid putrescible waste	Putrescible waste would be collected within clearly labelled putrescible waste bins placed throughout the Proposal site, particularly within the site office, kitchen and dining areas. At regular intervals, an employee would compile putrescible waste into a suitable disposal container. The compiled putrescible waste would then be collected by a contractor at regular intervals.
	General solid waste (non-putrescible)	Non-putrescible solid waste, including but not limited to recyclable materials, packaging and discarded consumables	Non-putrescible waste would be collected within clearly labelled waste and recycling bins placed throughout the Proposal site, particularly within the site office, kitchen and dining areas. At regular intervals, an employee would compile non-putrescible waste from these recycling bins into a disposal container such as a general waste bin. The compiled non-putrescible waste would be then collected by a contractor at regular intervals.
	Liquid waste	Sewerage	Sewage waste would be discharged to Sydney Water sewerage infrastructure in accordance with Sydney Water requirements.
MRF operation including ancillary activities	General solid waste (non-putrescible), special waste, liquid waste	Non-putrescible solid waste, including but not limited to: • Tool and equipment consumables • Plant and equipment maintenance waste (e.g. oily	Non-putrescible waste would be collected within clearly labelled waste and recycling bins placed throughout the Proposal site, particularly within the site office, kitchen and dining areas. At regular intervals, an employee would compile non-putrescible waste from these recycling bins into a disposal container such as a general waste bin. The compiled non-putrescible waste would be

Waste generating activity	Waste classification	Waste / resource types	Disposal method
		rags, oil filters, tyres etc) • Trade waste	then collected by a contractor at regular intervals. Liquid waste would be collected and transferred to a dedicated recycling facility where possible, to ensure diversion from landfill. The Proponent maintains a trade waste agreement with Sydney Water (TWA21629) for the discharge of trade waste from the workshops.

19.5 Mitigation measures

Waste quantities anticipated to be generated by the Proposal are anticipated to be relatively minor. Table 19-5 outlines the mitigation measures that will be implemented by SUEZ to further minimise impacts of waste.

Table 19-5 Mitigation measures (waste management)

ID	Mitigation measures	Timing
WM1	A CEMP and OEMP, or equivalent, will be prepared for the Proposal to minimise waste related impacts and will include the following: • Waste prioritisation. Avoidance and reuse of construction materials will have priority over recycling materials. Recycling of materials will have priority over disposal of materials • Location and number of collections bins. There will be adequate placement of general waste and recycling bins around the Proposal site, with particular emphasis on the lunchroom and site office • Waste management protocols: – Management of any identified hazardous waste streams – Procedures to manage waste streams, including handling, storage, classification, quantification, identification, and tracking – Procedures and targets for reuse and recycling of waste materials • Induction and training procedures for staff. An induction will be provided to relevant staff and sub-contractors outlining their responsibilities with regard to waste management.	Construction and operation

Conclusion

The waste impacts to the construction and operation of the Proposal are deemed to be minor and any impacts would be readily managed and reduced through the implementation of mitigation measures.

The construction phase of the Proposal would involve infrastructure works and the construction of infrastructure, which would predominantly generate waste in the form of surplus building and packaging materials, and from construction personnel' amenities and lunchrooms.

The operational phase of the Proposal would involve waste being generated through offices, amenities, lunchrooms and the maintenance of plant and equipment which would generate waste in the form of cardboard, plastics, fuels / oils and tool and equipment consumables.

Measures to mitigate the effect of waste during construction and operation of the Proposal would be incorporated into the Proposal's CEMP and OEMP prior to construction and operation

20 CUMULATIVE IMPACTS

Summary

The Proposal has been assessed in the context of existing, proposed and future developments in the surrounding area that may result in cumulative environmental impacts.

A desktop review of available government planning databases revealed six developments in the surrounding area that have the potential to interact with the construction and operation of the Proposal. These developments comprised:

- Redevelopment of Bankstown North Public School (SSD 10290)
- Mixed commercial and residential complex development, 190 Stacey Street, Bankstown (DA-741/2014)
- Eden Greenacre Complex development (DA-3/2015)
- Mixed use complex development, 32 Kitchener Parade, Bankstown (DA-957/2017/B)
- Residential apartments development, 8 Jacobs Street, Bankstown (DA-204/2017/A)
- Warehouse development, 39 Rosedale Avenue, Greenacre (DA-123/2019)

The cumulative impacts of the Proposal and the surrounding developments have been considered in relation to each of the key environmental issues identified in Chapters 7 to 19 of this EIS.

The nature of the other development proposed in the area are considered unlikely to generate similar impacts to the Proposal, particularly during operation, minimising the potential for cumulative impacts to arise. Across the issues assessed for cumulative impacts no significant additional impacts or exceedances of criteria were identified. As such, the mitigation measures identified for the Proposal would also effectively mitigate the cumulative impacts identified within this section.

20.1 Introduction

This section outlines the assessment of cumulative impacts associated with the Proposal to address the SEARs issued by DPIE. The Proposal has been assessed in the context of proposed and future developments in the surrounding area that may result in cumulative environmental impacts. The SEARs relevant to cumulative impacts related to the Proposal, and a summary of where they have been addressed are presented in Table 3-1.

Table 20-1 SEARs (cumulative impacts)

SEARs	Where addressed
General Requirement	
The environmental impact statement (EIS) must be prepared in accordance with, and meet the minimum requirements of, clauses 6 and 7 of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000*. In addition, the EIS must include a: • likely interactions between the development and existing, approved and proposed operations in the vicinity of the site	Chapters 7 to 19 Section 20.4 and Section 20.5
• Detailed assessment of the key issues specified below, and any other significant issues identified in this risk assessment, which includes: – an assessment of the potential impacts of all stages of the development, including any cumulative impacts, taking into consideration relevant guidelines, policies, plans and statutes	Chapters 7 to 19 Section 20.4 and Section 20.5

20.2 Methodology

A desktop review of government planning portals was undertaken on 2 February 2020 within a 2.5 km radius and along key transport routes, to identify proposed or approved developments surrounding the Proposal. This desktop review included:

- A search of the Canterbury-Bankstown DA decisions register, which identified five local development applications within the vicinity of the Proposal site
- A search of DPIE's Major Projects planning portal, which identified one development within the vicinity of the Proposal site.

The cumulative impacts of the Proposal have been considered in relation to each of the identified issues in Chapters 7 to 19. Impacts of the Proposal, particularly in relation to traffic, noise and air quality, have been considered in technical studies undertaken as part of this EIS. This assessment considers both construction and operational cumulative impact scenarios associated with the Proposal and the surrounding developments identified below. The key issues that have been considered to determine the potential for cumulative impacts include the following:

- Traffic and transport
- Air quality and odour
- Soil and water
- Noise and Vibration
- Hazards and risk
- Social impacts
- Biodiversity
- Aboriginal and non-Aboriginal heritage
- Visual amenity
- Waste management.

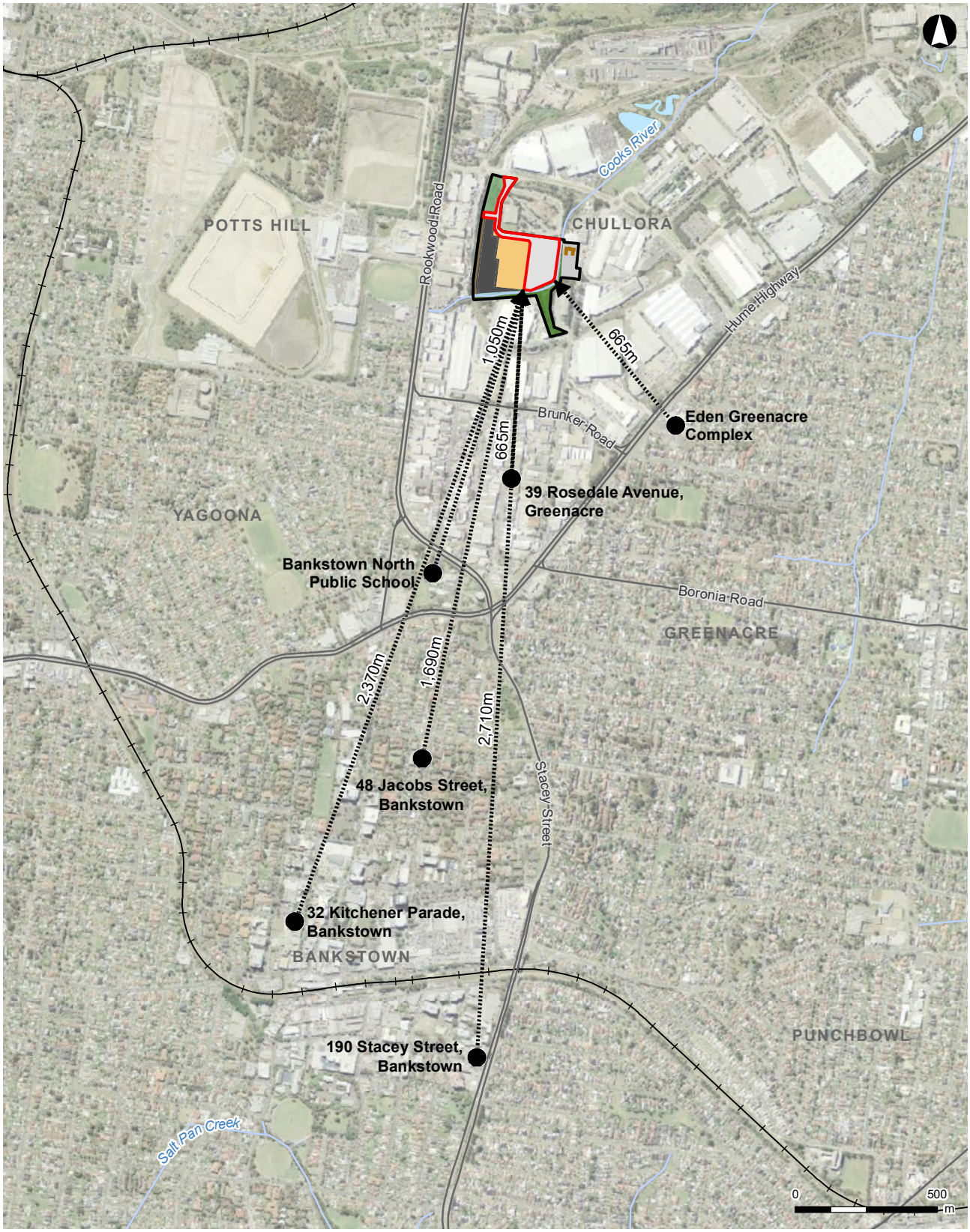
20.3 Existing environment

With respect to the key aspects covered in this cumulative assessment, the existing environment is discussed in detail in the following sections:

- Traffic and transport: Section 7.3 of this EIS
- Air quality and odour: Section 8.3 of this EIS
- Soil and water: Section 9.3 and Section 10.3 of this EIS
- Noise and Vibration: Section 11.3 of this EIS
- Hazards and risk: Section 12.3 of this EIS
- Social impacts: Section 13.3 of this EIS
- Biodiversity: Section 14.3 of this EIS
- Aboriginal and non-Aboriginal heritage: Section 15.3 and 16.4 of this EIS
- Visual amenity: Section 18.3 of this EIS
- Waste management: Section 19.3 of this EIS.

In general, the Proposal is consistent with the function and character of the established land uses across the broader area. Further, the Proposal would replace the previous Chullora RRC which comprised a structure of a similar nature, size and scale.

The nearby developments considered to have potential to, with the Proposal, result in cumulative environmental impacts, identified in the desktop reviews are described in Section 20.3.1 and shown in Figure 20-1.



LEGEND

- Chullora RRP site boundary
- Proposal site
- Future stage
- Flood detention basin
- Established earthworks
- Existing car parking area
- Existing site office
- Cooks River stormwater canal
- Landscaping area
- Vegetated area
- Major road
- Railway
- Watercourse

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Aerial imagery source: NSW LPI

1:20,000 at A4

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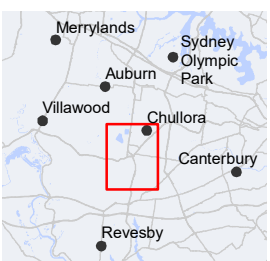


Figure 20-1: Surrounding developments

20.3.1 Surrounding developments

Chullora has been identified as a significant industrial and urban services precinct in the South District Plan (Greater Sydney Commission, 2018b). A key aim of the South District Plan is to retain existing areas of industrial land use in order to service larger freight and logistic operations in the Western City District. As such, suburbs such as Chullora are unlikely to be a focus of residential expansion and therefore it is unlikely that the Proposal will impact on future residential developments.

A review of the Major Projects planning portal and Council's DA tracker identified six nearby developments that have potential to be constructed and / or operate concurrently with the Proposal. These are described below.

Redevelopment of Bankstown North Public School (SSD 10290)

The Redevelopment of Bankstown North Public School comprises the construction of a new school building to provide additional permanent teaching spaces. This upgrade is anticipated to be completed by 2022. The school site is approximately one km to the south of the Proposal site and is currently in the planning phase, with SEARs issued in May 2019. As the development may be constructed concurrently with the construction and operation of the Proposal, the cumulative impacts of the school redevelopment have been considered. Bankstown North Public School is on the Hume Highway, with the key access corridor being this major highway.

Mixed commercial and residential complex, 190 Stacey Street, Bankstown (DA-741/2014)

The 190 Stacey Street, Bankstown development comprises the demolition of existing structures and construction of two towers; one 14 storey and one 7 storey tower consisting of mixed commercial and residential units. This site is located approximately 2.5 km south of the Proposal site. The key access corridor for this development is Stacey Street Bankstown, which is not likely to be used by vehicles accessing the Proposal site during construction or operation.

The DA for this project was approved by Council on 23 September 2015, and a modification to the design of the building was approved on 18 December 2019. The development may be constructed concurrently with the Proposal.

Eden Greenacre Complex (DA-3/2015)

Eden Greenacre is a commercial and residential development including 177 residential apartments, 14 townhouses, basement and at-grade car parking, new driveway access at Hillcrest Avenue and Northcote Road and associated landscaping. This site is located approximately 600 m to the south east of the Proposal site at 231 Hume Highway. The main road to access Greenacre is the Hume Highway. Greenacre was approved on 18 November 2015. Construction of this development has recently commenced and is considered likely to be completed by the time of construction of the Proposal begins. To be conservative however it has been considered within this assessment.

Mixed use complex, 32 Kitchener Parade, Bankstown (DA-957/2017/B)

The 32 Kitchener Parade, Bankstown development comprises of the demolition of existing structures and the construction of a 14-storey mixed use development consisting of basement car-parking, 516 residential apartments, retail tenancies, a health service facility, child-care centre and associated landscaping and site works. The site is located approximately 2.5 km to the south of the Proposal site. This development was approved on the 12th February 2020 and construction may occur concurrently with the construction of the Proposal.

Residential apartments, 48 Jacobs Street, Bankstown (DA-204/2017/A)

The 48 Jacobs Street, Bankstown development involves the construction of a 4-storey residential flat building comprising 12 units. The site is located approximately 1.8 km from the Proposal site. The DA was approved on 20th October 2019. This development is located on Jacobs Street which would not be accessed by vehicles accessing the Proposal site. Construction of this development may overlap with the construction of the Proposal.

Warehouse development, 39 Rosedale Avenue, Greenacre (DA-123/2019)

The 39 Rosedale Avenue, Greenacre development comprises the construction of a new two storey warehouse development for use as a catering facility and associated signage. This site is approximately 0.75 km from the Proposal site and was approved on 21st October 2019. This development site is relatively close to the Proposal site, and therefore uses the same access corridor which is the Hume Highway or Rookwood Road. Construction of this development may overlap with construction of the Proposal.

20.4 Construction impacts

The potential cumulative impacts for construction are identified in Table 20-2 below.

Table 20-2 Potential cumulative construction impacts

Issue	Potential Cumulative Impacts
Traffic and access	The nearby projects that could have traffic that interacts with traffic generated by the Proposal are: • The redevelopment of the Bankstown North Public School • The Eden Greenacre development • The warehouse development on Rosedale Avenue. The introduction of additional heavy and light vehicles from the construction of these developments may result in temporary deterioration of intersection performance on the surrounding road. As discussed in the TIA (Appendix J) and Chapter 7 of this EIS, any increase in construction traffic associated with the Proposal would have a negligible impact on the current capacity of the surrounding road network (particularly on Rookwood Road and the Hume Highway). The nature of the nearby developments is also not likely to generate significant volumes of construction traffic. The potential for cumulative construction traffic impacts is therefore considered to be minor.
Air quality and odour	The AQIA report, prepared by Katestone (Appendix K), concluded that air quality emission during construction would be negligible. The closest development identified (Eden Greenacre Complex) is located approximately 600 m from the Proposal site. Further, given the limited scale and the scheduled timing for the construction of the Proposal and the surrounding developments, this would avoid any major cumulative impacts with regard to air quality.
Soils and water	A review of the upstream catchment area for the Upper Cooks River found that the following development would be located within the catchment area: • The redevelopment of the Bankstown North Public School • The warehouse development on Rosedale Avenue. Any impacts on water quality, quantity or flooding from these developments may have the potential to cumulate with impacts from the Proposal, causing downstream impacts on the Upper Cooks Rivers. The Water and Hydrology Assessment prepared by Costin Roe (Appendix L) found that the Proposal would not have an adverse impact on water quality, quantity or flooding Like the Proposal, the above

Issue	Potential Cumulative Impacts
	developments would need to appropriately manage water quality and flooding impacts. The Proposal would be constructed on an existing established earthworks area avoiding potential impact from disturbing contaminated soils or acid sulphate soils, or from increasing erosion or sedimentation. Further, the nearest proposed development (Eden Greenacre Complex) is located approximately 600 m from the Proposal site making cumulative soil impacts unlikely.
Noise and vibration	The NVIA undertaken by Wilkinson Murray (Appendix N) assessed the noise and vibration impact of the Proposal. The main activities and noisiest plant items to be used during construction include equipment such as cherry pickers and front-end loaders, which are not considered to be high noise generating sources. The assessment concluded that the Proposal would be in compliance with relevant criteria at all residential receivers during construction with the exception of one minor exceeded (of one dBA) at one receiver during one stage of construction). The NCA where the exceedance would be experienced (NCA) is not located adjacent to any of the nearby developments in the area and would be unlikely to experience significant cumulative impacts. NCA 8-11 (refer Figure 11-1 in Section 11.2.1) have been identified as having potential to be impacted by both the Proposal and the Eden Greenacre development (noting that the Eden Greenacre development is located within NCA10). However, it is likely that the Greenacre development will be finished its construction phase prior to the commencement of the construction of the Proposal. Further, at each of these receivers the predicted $L_{Aeq,\ 15\ minute}$ caused by the Proposal would be between 7-23 dBA below the NML. NCA 4-5 have been identified as having potential to be impacted by cumulative impacts from the Proposal and the Bankstown North Public School Redevelopment. Similar to the above, noise generated by the Proposal would be more than at least 7 dBA below the NML, meaning the Proposal's contribution to any cumulative construction noise impacts would be minor. Mitigation measures have been put in place to reduce noise and vibration impacts during construction of the Proposal. These will help reduce cumulative impacts with surrounding developments, and include operating during approved hours, undertaking regular noise monitoring, undertaking community consultation and responding to complaints, turning off machinery when not in use, avoiding using noisy plant simultaneously and/or close together, etc. Construction noise impacts would be temporary in nature. Future developments in the local area would be subject to the same assessment process as discussed within the noise impact assessment report, thereby limiting the potential for industrial noise increasing over time and thereby limiting the potential for future cumulative noise impacts.
Hazard and Risk	The hazards and risk chapter identified potential construction risks including accidental release or improper transport, handling and storage of dangerous goods and / or hazardous substances, spills and loss of containment of flammable / combustible or corrosive liquids and fire and explosion. Any incidents during construction of the Proposal, or any of the other of the developments, would likely be localised to the direct development sites. Given the distance between projects there would be no cumulative impacts relating to hazard and risk.
Socio-economic	The construction stage of the Proposal would create new temporary employment, as would the construction of other nearby development resulting in an economic benefit for the local economy. Should construction of other projects occur at the same time as the Proposal, increased levels of traffic, noise, and air pollution may be experienced by residents or industrial receptors. However, considering the industrial setting of the Proposal site and the findings of above relating to amenity impacts, this impact is likely to be minimal and localised to the surrounding industrial area.

Issue	Potential Cumulative Impacts
Biodiversity	No threatened species, populations or communities are anticipated to be present or affected by the construction of the Proposal within the Proposal site and no clearing is proposed. Given that it is considered highly unlikely that the Proposal would result in any impact on threatened species, populations or ecological communities, or their habitats, no cumulative impacts to biodiversity have been identified. Further, the Proposal site is more than 600 m from the closest major development. Therefore, any risk of cumulative impacts on biodiversity is negligible.
Aboriginal and non-Aboriginal heritage	No items of Aboriginal heritage significance or non-Aboriginal heritage significance have previously been identified within the Proposal site. The Proposal site has already been disturbed from previous development and it is considered that there is a negligible likelihood of Aboriginal objects or places, or non-Aboriginal heritage items being present within the Proposal site. The Proposal site is not within close proximity to any other development and therefore cumulative impacts on heritage items are unlikely.
Visual amenity	The visual impact assessment determined that there would be negligible visual amenity impact to the surrounding receivers during the construction of the Proposal. It is likely that equipment such as cranes, cherry pickers and forklifts would be visible for limited durations through the construction works (however only to non-residential receivers). Given the low-rise and temporary nature of construction works and the minimal construction works being undertaken in the surrounding area by other developments it is unlikely that these works would have a cumulative impact on the landscape and visual amenity during construction.
Waste Management	The Proposal would produce minimal construction waste. All other nearby developments to the Proposal are of a relatively small scale and are considered likely to generate minimal waste volumes only. Therefore, the cumulative impacts of waste management from the Proposal and surrounding developments is minimal.

20.5 Operation impacts

The potential cumulative impacts for operation are identified in Table 20-3 below.

Table 20-3 Potential cumulative operational impacts

Issue	Potential Cumulative Impacts
Traffic and access	The TIA Assessment undertaken by TTPP (Appendix J) assessed the traffic, access and parking impacts associated with the operation of the Proposal. The assessment included consideration of background growth in traffic (including generated from nearby developments) with scenarios modelling up to the year 2032 which would include traffic from other nearby developments. The assessment found that the peak activity periods for the Proposal would occur outside the peak hours of the surrounding road network and that the Proposal would not have a significant impact on the surrounding road network. The nearby developments are not considered likely to generate significant volumes of traffic, and the traffic generated would predominantly be from light vehicles (e.g. accessing the residential developments) thereby limiting the potential for future cumulative traffic and transport impacts.
Air quality and odour	The Air Quality Assessment report, prepared by Katestone (Appendix K), concluded that air quality impacts from the Proposal would be minimal, and that no exceedances of air quality criteria would be experienced. Through the implementation of the mitigation measures identified, the Proposal is unlikely to have an impact on air quality.

Issue	Potential Cumulative Impacts
	Dust emissions and particulate matter during the operational phase of the Proposal is predicted to be minimal at all sensitive receivers (including those near other developments) and would comply with the established criteria. Since the other developments in close proximity of the Proposal site are of a small scale and are not of a similar nature to the Proposal, air quality cumulative impacts are considered unlikely. The nature of the nearby development (mostly commercial and residential) means that they are not likely to generate similar air quality impacts to the Proposal and therefore cumulative air quality impacts are considered unlikely.
Soils and water	The redevelopment of the Bankstown North Public School and the warehouse development on Rosedale Avenue are located in the same water catchment area as the Proposal site, potentially resulting in cumulative downstream water quality and quantity impacts for the Upper Cooks River. The Water and Hydrology Assessment prepared by Costin Roe (Appendix L) found that the Proposal would not have an adverse impact on water quality, quantity or flooding. Flooding regimes within the Cooks River stormwater canal would be improved by the completion of the flood mitigation works (DA 366/2020), helping to mitigate any potential for cumulative impacts. Like the Proposal, the above developments would need to appropriately manage water quality and flooding impacts. The Proposal would have negligible operational soil and water impacts. Further the surrounding developments are not considered of a nature likely to have operational soil and water impacts and are located at least 600 m form the Proposal site. Therefore, cumulative impacts are considered highly unlikely.
Noise and vibration	The NVIA undertaken by Wilkinson Murray (Appendix N) assessed the noise and vibration impact from the operation of the Proposal. The major operational noise sources associated with the Proposal are various material handling and processing activities occurring within the MRF building, as well as trucks delivering material to the Proposal site. All operational noise levels comply with the established project trigger noise levels at all nearby receivers during all assessment periods. The assessment concluded that the Proposal would be in compliance with relevant criteria at all residential receivers and that operational noise from the Proposal would not be expected to result in any increase in industrial noise levels experienced by the existing or future residents. Noise and vibration impacts from nearby developments would be minimal due to their nature i.e. they are predominantly residential and mixed use development rather than industrial development) and small scale and are not of a similar nature. Therefore, cumulative impacts are unlikely.
Hazard and Risk	All dangerous goods present on the Proposal site would be stored in locations and quantities below the risk levels under SEPP 33. It is therefore considered that the Proposal would not pose an unacceptable level of risk to the surrounding community, negating the need for a PHA for the Proposal. As no major effects would be felt outside of the Proposal site, it is considered unlikely that any cumulative impacts would arise as a result of the operation of the Proposal. Any incidents, including fire, during operation of the Proposal or any other developments would likely be localised to the direct development sites. Given the distance between projects there would be no cumulative impact.
Socio-economic	The business operation would operate in a similar manner to the previous Chullora RRP and would result in socio-economic benefits to the local economy by employing local labour and to the wider region by supporting the development of necessary waste infrastructure

Issue	Potential Cumulative Impacts
	Increased levels of traffic, noise, and air pollution may be experienced by residents or industrial receptors during the operation of the Proposal and other developments. However, considering the industrial setting of the Proposal site and the findings of above relating to amenity impacts, this impact is likely to be minimal and localised to the surrounding industrial area.
Biodiversity	Negligible operational biodiversity impacts have been identified for the Proposal. Further, the Proposal site is more than 600 m from the closest major development. Therefore, any risk of cumulative impacts on biodiversity is negligible.
Aboriginal and non-Aboriginal heritage	Negligible operational heritage impacts have been identified for the Proposal. Further, the Proposal site is more than 600 m from the closest major development. Therefore, any risk of cumulative impacts on heritage is negligible.
Visual amenity	The visual impact assessment determined that there would be negligible visual amenity impact to the surrounding receivers during operation of the Proposal. The Proposal would be largely screened from the surrounding sensitive receivers and would only be visible from within the surrounding industrial area and is considered to be compatible with the surrounding industrial land uses. Therefore, it is not anticipated that a cumulative scenario would result in any visual impacts above what was assessed for the Proposal in isolation.
Waste Management	The Proposal would produce waste as a by-product of its operations of a negligible quantum. All other developments nearby are of relatively small scale and are or a different type of development to the Proposal. Therefore, cumulative impacts of waste management are unlikely.

20.6 Mitigation measures

Across the issues assessed for cumulative impacts, no significant additional impacts or exceedances of criteria have been identified. As such, the mitigation measures identified for the Proposal would effectively mitigate any cumulative impacts identified within this section.

The mitigation measures for each of the key issues assessed are presented in Chapter 22.

Conclusion

The Proposal has been assessed in the context of six identified proposed future developments in the surrounding area that may result in cumulative environmental impacts. The nature of the other developments proposed in the area are considered not likely to generate similar impacts to the Proposal, particularly during operation, minimising the potential for cumulative impacts to arise. Across the issues assessed for cumulative impacts, no significant additional impacts or exceedances of criteria for key environmental aspects were identified. As such, the mitigation measures identified for the Proposal would also effectively mitigate the cumulative impacts identified within this section.

PART D

RISK ASSESSMENT, MITIGATION MEASURES AND CONCLUSION



21 ENVIRONMENTAL RISK ASSESSMENT

Summary

An environmental risk analysis (ERA) has been undertaken to identify the key environmental impacts and mitigation measures associated with construction and operation of the Proposal. This ERA addresses the SEARs in relation to environmental risk.

This ERA has identified and assessed the potential environmental impacts associated with the Proposal and has assigned a risk ranking to each of the impacts identified. Each impact was ranked between 'low' and 'very high' based on the unmitigated impacts that could potentially result. Mitigation measures were applied to each impact and a residual risk ranking was assigned.

Prior to the implementation of mitigation, four risks were identified as being 'high' and 10 as 'moderate' with the remaining 11 rated as 'low'. Following the implementation of mitigation measures, no 'high' risks and only one 'moderate' risk would remain.

21.1 Introduction

An environmental risk analysis (ERA) has been undertaken to quantify the key environmental impacts associated with construction and operation of the Proposal, as identified in Chapters 7 to 20 above. This ERA assigns a risk ranking to each impact, before and after the application of the mitigation measures identified. The ERA has been undertaken to address the SEAR in relation to environmental risk, which is shown in Table 21-1.

Table 21-1 SEARs (general)

SEARs	Where addressed
General requirements	
Risk assessment of the potential environmental impacts of the development, identifying the key issues for further assessment	Section 21.3

21.2 Methodology

An assessment of the environmental risk associated with the Proposal has been undertaken to identify the residual environmental risks present once the mitigation measures identified have been applied for each environmental aspect. This ERA aims to assign a qualitative environmental risk category to each environmental aspect. Each of the potential environmental aspects was initially ranked between 'low' and 'very high' based on its potential unmitigated impacts.

Mitigation measures to reduce environmental risk, as identified throughout Chapters 7 to 20 and in Chapter 22 were then applied to each aspect and a residual risk ranking was assigned. Risk rankings were determined as a product of the likelihood or an impact occurring and the consequence in the event that it does occur.

The criteria for evaluating likelihood and consequence of risk are identified in Table 21-2 and Table 21-3.

Table 21-2 Criteria for evaluating likelihood

Level	Descriptor	Description	Frequency of Occurrence
A	Almost Certain	Is expected to occur in most circumstances	Once per month
B	Likely	Will probably occur in most circumstances	Between once a month and once a year
C	Possible	Might occur at some time	Between once a year and once in five years
D	Improbable	Could occur at some time	Between once in five years and once in 20 years
E	Rare	May occur in exceptional circumstances	Once in more than 20 years

Table 21-3 Criteria for evaluating consequence

Level	Category	Safety	Financial	Operational	Environmental	Community
1	Not Significant	No medical control	<$250,000	<6 hrs closure or disruption to facility operations	Release to the environment immediately contained.	No community or stakeholder complaints.
2	Minor	Lost time, injury occurs or medical control required	≥$250,000 but less than $2M	≥6 hrs but less than 24 hrs closure or disruption to facility operations	Release to environment contained with internal assistance.	Several community or stakeholder complaints. Complaints rectified within adequate timeframes.
3	Moderate	Serious injury occurs	≥$2M but less than $10M	≥24 hrs but less than 48 hrs closure or disruption to facility operations	Release to the environment and contained with external assistance.	Multiple and sustained community or stakeholder complaints. Complaints addressed after an interval. Limited media coverage of issues raised.
4	Major	Single fatality occurs	≥$10M but less than $50M	≥2 days but less than 5 days closure or disruption to facility operations	Pollution event with short-term detrimental effect.	Widespread community and stakeholder concern. Sustained failure to address complaints. Extensive media coverage.
5	Severe	Multiple but localised fatalities occur	≥ $50M	≥5 days closure or disruption to facility operations	Pollution event with long-term detrimental effect.	Ongoing and widespread community and stakeholder concern, culminating in litigation. Inability to address complaints. Extensive and sustained negative media coverage.

Table 21-4 provides the risk categories used to guide the identification of an appropriate risk ranking based on the likelihood and consequence levels identified above.

Table 21-4 Risk analysis categories and criteria for risk rating

Likelihood	Consequence				
	1 – Not significant	2 – Minor	3 – Moderate	4 – Major	5 – Severe
A – Almost certain	Moderate	Moderate	High	Very High	Very High
B – Likely	Low	Moderate	High	Very High	Very High
C – Possible	Low	Low	Moderate	High	High
D – Improbable	Low	Low	Low	Moderate	Moderate
E - Rare	Low	Low	Low	Low	Moderate

21.3 Risk Assessment

Table 21-5 Environmental risk assessment for the Proposal

Issue	Key Issue	Potential Impacts	Risk ranking: Pre-mitigation	Mitigation	Risk ranking: Post-mitigation	Reference
Traffic, access and parking	Yes	Increased traffic on local and regional roads during construction.	L	Construction of the Proposal would be minimal in scope and duration and therefore traffic would have a very minor impact on the local road network. The measures outlined in the TIA, Section 7.6 and a CTMP will be implemented during construction of the Proposal to minimise potential traffic impacts.	L	Chapter 7 Appendix J TIA
		Increased traffic on local and regional roads during operation.	M	Operational traffic would increase due to the Proposal and have a minor impact on the local road network. The measures outlined in the TIA, Section 7.6 and an OTMP will be implemented during operation of the Proposal to minimise potential traffic impacts.	L	
		Onsite traffic conflict or crossovers, resulting in damage to vehicles, equipment or personnel on site.	H	Onsite traffic may pose a risk of damage to vehicles, equipment or personnel due to increased movements of trucks onsite. A number of measures have been incorporated into the design of the Proposal to minimise the potential for traffic conflicts onsite; including separation of personnel (via elevated platforms and a dedicated pedestrian overbridge) from moving traffic or machinery, provisions of separate access points for light and heavy vehicles, and minimisation of cross over conflict points throughout the site. Further measures outlined in TIA, Section 7.6 and OTMP will be implemented during operation of the Proposal to control traffic movements within the Proposal site.	L	

Issue	Key Issue	Potential Impacts	Risk ranking: Pre-mitigation	Mitigation	Risk ranking: Post-mitigation	Reference
Air quality and odour	Yes	Increased air pollution (from the construction of the Proposal resulting in impacts on the environment and community.	L	The Proposal would not comprise earthworks and would be minor and temporary in nature, minimising the potential for air quality impacts Measures outlined in AQIA, Section 8.6 and CEMP will be implemented to control air quality impacts during the construction of the Proposal.	L	Chapter 8 Appendix K AQIA
		Increased air pollution (PM, TSP and depositional dust) from the operation of the Proposal resulting in impacts on the environment and community.	M	Increases in air pollution including dust, PM and odour during operation would be minor. Measures outlined in AQIA, Section 8.6 and an OEMP will be implemented control air quality impacts during the operation of the Proposal.	L	
		Operational odour impacting nearby sensitive receptors	L	It is possible that small amounts of incoming waste may be odorous, depending on the source of the waste, however these would result in a negligible impact. Measures outlined in AQIA, Section 8.6 and an OEMP will be implemented to control odour impacts during the operation of the Proposal.	L	
Water quality and hydrology	Yes	Pollutants caused by the construction or operation of the Proposal impacting surface or groundwater quality	H	Water quality and erosion and sediment controls would minimise water quality impacts. Measures outlined in Section 9.6, CEMP, ESCP and OEMP will be implemented to minimise water quality impacts.	L	Chapter 9 Appendix L– Water quality and hydrology
		Changes in surface water run-off causing	M	Existing and proposed stormwater infrastructure would adequately control downstream water quantity impacts.	L	

Issue	Key Issue	Potential Impacts	Risk ranking: Pre-mitigation	Mitigation	Risk ranking: Post-mitigation	Reference
		downstream flooding impacts		Measures outlined in Section 9.6, CEMP, ESCP and SWMP will be implemented to minimise water quality impacts.		
		Flooding causing damage to the Proposal or causing safety risks to personnel	M	Existing flood detention infrastructure would provide adequate flood immunity for the Proposal. Measures outlined in Section 9.6, CEMP, ESCP and a FERP will be implemented to minimise water quality impacts.	L	
Soils and contamination	Yes	Disturbance of contaminated soil or groundwater during construction.	L	Construction of the Proposal would involve limited ground disturbance and no earthworks and is therefore unlikely to cause any disturbance to contaminated soil or groundwater. Measures outlined in Section 10.6 and a CEMP will be implemented to control potential impacts associated with disturbance of contaminated material.	L	Chapter 10
		Increased erosion and risk of sedimentation due to disturbance of soils.	M	Construction of the Proposal would involve limited ground disturbance and no earthworks and is therefore unlikely to result in erosion or sedimentation. Measures outlined in Section 10.6 and a CEMP will be implemented to control the potential for erosion and sedimentation.	L	
		Contamination of soils and groundwater due to the construction and / or operation of the Proposal, resulting in impacts to the surrounding environment.	M	The construction and / or operation of the Proposal would have the potential to result in contamination of soils or groundwater (e.g. due to spills and leaks or leachate generation). Measures outlined in Section 10.6, a CEMP and an OEMP will be implemented to minimise the potential for the Proposal to cause contamination.	L	
Noise and Vibration	Yes	Increased noise and vibration levels at adjoining receivers (including nearby	M	Construction works are minor in nature and would result in a minor impact on nearby sensitive receivers. Measures outlined in the NVIA, Section 11.6 and a CEMP will be implemented to control noise impacts during the construction of the Proposal.	L	Chapter 11 Appendix N NVIA

Issue	Key Issue	Potential Impacts	Risk ranking: Pre-mitigation	Mitigation	Risk ranking: Post-mitigation	Reference
		residential areas and sensitive receivers) during construction of the Proposal.				
		Increased noise and vibration levels at adjoining receivers (including nearby residential areas and sensitive land uses) caused by equipment operation and on-site vehicle movements during operation of the Proposal.	M	Operation of the Proposal would have a minor impact on nearby sensitive receivers. Measures outlined in the NVIA, Section 11.6 and an OEMP will be implemented to control noise impacts during the operation of the Proposal.	L	
Hazards and Risk	Yes	Possible occurrence of a health and safety or environmental incident caused during construction hazard and risks (e.g. vehicle collision, spill event etc)	M	There is potential for a health and safety or environmental incident to occur on-site during construction of the Proposal. Measures outlined in Section 12.6 and a CEMP will be implemented to control hazards and risks during the construction of the Proposal.	L	Chapter 12
		Occurrence of a health and safety or environmental incident caused by operational hazard and risks (e.g. vehicle collision, spill event etc), including risk of fire within the MRF.	H	There is potential for a health and safety or environmental incident to occur on-site during operation of the Proposal. Measures have been incorporated into the design of the MRF to minimise potential hazards (such as the inclusion of fire suppression infrastructure, safety equipment and eliminated traffic conflict points). Measures outlined in Section 12.6, an Emergency Response Plan, and an OEMP will be implemented to control hazards and risks during the operation of the Proposal.	M	

Issue	Key Issue	Potential Impacts	Risk ranking: Pre-mitigation	Mitigation	Risk ranking: Post-mitigation	Reference
Social	No	Perceived safety risk held by the community in relation to fire at the MRF due to the fire at the previous Chullora RRC	L	Of the stakeholders contacted for direct consultation on this issue, only one provided a material response, stating that the Proposal raised no personal concerns regarding the safety of the Proposal. The MRF complies with the BCA and Fire Design Guidelines, and has a adopted a number of safety features outlined in Section 4.3.	L	Chapter 13
		Social or economic impacts to nearby communities as a result of the operation of the Proposal (e.g. amenity impacts)	L	Negative social impacts were found to be negligible from the Proposal (Appendix O). Measures outlined in the SIA, Section 13.6, CEMP and an OEMP will be implemented to minimise social impacts during the construction and operation of the Proposal.	L	Appendix O SIA
Biodiversity	No	Impacts to biodiversity due to the construction and / or operation of the Proposal, such as inadvertent impacts on adjacent habitat or vegetation; impact to fauna due to noise, dust or light spill; and/or transport of weeds and pathogens from the Proposal site to adjacent vegetation.	L	The Proposal would not include clearing of any vegetation. The construction and operation of the Proposal would have a negligible impact on biodiversity. Measures outlined in Section 14.6, a CEMP and an OEMP will be implemented to control any potential biodiversity impact associated with the construction and operation of the Proposal.	L	Chapter 13

Issue	Key Issue	Potential Impacts	Risk ranking: Pre-mitigation	Mitigation	Risk ranking: Post-mitigation	Reference
Aboriginal Heritage	No	Unexpected damage and/or destruction of Aboriginal heritage items of significance during construction or operation of the Proposal	L	The Proposal would not involve earthworks or major excavations. Further the likelihood of Aboriginal artefacts being present on site has been found to be low. Measures outlined in Section 15.6, a CEMP and an OEMP, comprising an unexpected finds protocols, will be implemented to control any unexpected finds of Aboriginal heritage items.	L	Chapter 13 Appendix Q- Aboriginal Due Diligence Assessment
Non-Aboriginal Heritage	No	Direct or indirect impact to non-Aboriginal heritage items during construction or operation of the Proposal	L	The Proposal would not involve earthworks or major excavations. No non-Aboriginal Heritage items have been identified within the Proposal site and indirect impacts are expected to be negligible. Measures outlined in Section 16.6, a CEMP and an OEMP, comprising an unexpected finds protocols, will be implemented to control any unexpected finds of Aboriginal heritage items.	L	Chapter 15.1
GHG emissions	Yes	Release of GHG emissions associated with the construction and operation of the Proposal (include CO_2, with smaller contributions from CH_4 and nitrous oxide N_2O)	L	GHG emissions associated with the construction and operation of the Proposal are expected to be minimal. Measures outlined in Section 17.6, a CEMP and an OEMP will be implemented to minimise GHG emissions produced by the Proposal associated with the construction and operation of the Proposal.	L	Chapter 17 Appendix R GHG Assessment
Visual Amenity	Yes	Visual changes during construction and operation of the Proposal.	L	Due to the temporary nature of the construction works, it is unlikely that visual impacts would be overly intrusive. Operationally, the Proposal site would not result in a material change to the visual amenity in the area. Selection of appropriate design materials would minimise visual impacts. Measures outlined in Section 18.6, a CEMP and an OEMP will be implemented to minimise visual impacts associated with the construction and operation of the Proposal.	L	Chapter 18

Issue	Key Issue	Potential Impacts	Risk ranking: Pre-mitigation	Mitigation	Risk ranking: Post-mitigation	Reference
Waste	Yes	Excessive generation of waste during construction or operation resulting in increased waste being sent to landfill.	L	The Proposal would generate minimal waste quantities during construction and operation. Measures outlined in Section 19.5, a CEMP and an OEMP will be implemented to minimise waste generation and prioritise reuse / recycling of materials over direction of waste to landfill.	L	Chapter 19
Cumulative Impacts	Yes	Cumulative impacts during construction or operation for nearby sensitive receivers (such as worsened air quality, increased traffic and increased noise) from the development of multiple projects including the Proposal.	M	Due to the nature and timing of nearby development cumulative impacts would be minor. Measures outlined in Section 20.6, a CEMP and an OEMP will be implemented to minimise impacts on nearby sensitive receivers.	L	Chapter 20

Conclusion

An ERA has been undertaken to identify the key environmental impacts and mitigation measures associated with construction and operation of the Proposal. Prior to the implementation of mitigation, four risks were identified as being ‘high’ and 10 as ‘moderate’ with the remaining 11 rated as ‘low’. Following the implementation of mitigation measures, no ‘high’ risks and only one ‘moderate’ risk would remain.

22 COMPILATION OF MITIGATION MEASURES

Summary

The EIS for the Proposal has identified a range of environmental impacts and recommended management and mitigation measures to avoid, remedy to mitigate these impacts (refer Chapters 7 to 20 of this EIS). This compilation of mitigation measures has been provided to satisfy schedule 2, Part 3 clause 7 (1)(e) of the EP&A Regulations. These draft measures may be revised in response to public submissions to the EIS and / or design changes following public exhibition of this EIS. It is envisaged that these mitigation measures will form the basis for the Conditions of Consent which would be provided for the Proposal, subject to successful approval.

Mitigation measures have been prescribed for both construction and operational phases of the Proposal for each of the environmental issues outlined in this EIS. For the purpose of these mitigation measures, the following definitions apply to the terms used in the implementation phase column:

- Construction phase – either prior to, or during construction of all physical works for the Proposal
- Operation phase – either prior to, or during the operation of the Proposal.

As described in Chapters 7 to 20 of this EIS, no significant environmental impacts have been identified for either the construction or operational phase of the Proposal. In effect, the mitigation measures identified would manage the residual environmental impacts, all of which are considered to be of minimal significance.

The EIS for the Proposal has identified a range of environmental impacts and recommended management and mitigation measures to avoid, remedy to mitigate these impacts (refer Chapters7 to Chapter 19 of this EIS). This compilation of mitigation measures has been provided to satisfy schedule 2, Part 3 clause 7 (1)(e) of the EP&A Regs.

This section presents a summary of the measures which the Applicant is committed to implementing either prior to construction, during construction or during operation. These draft mitigation measures may be revised in response to public submissions to the EIS and / or design changes following public exhibition of this EIS. It is envisaged that these mitigation measures will form the basis for the Conditions of Approval which would be provided for the Proposal, subject to successful approval.

The draft Compilation of Mitigation Measures for the Proposal is provided in Table 22-1 below.

The ‘implementation stage’ column of Table 22-1 details the timing as to when the specific mitigation measures would be undertaken.

For the purpose of this Compilation of Mitigation Measures, the following definitions apply to the terms used in the implementation phase column:

- Construction phase – either prior to, or during construction of all physical works for the Proposal
- Operation phase – either prior to, or during the operation of the Proposal.

Table 22-1 Compilation of mitigation measures

No.	Mitigation measure	Timing
Traffic, access and parking		
TA1	A CEMP, or equivalent, will be prepared to address the specific traffic control requirements during the construction phase of the Proposal. The plan will assess the provision of traffic control measures, including: • Site signage and road signage • Enforcement of speed limits for construction traffic	Construction

No.	Mitigation measure	Timing
	• Site-internal pedestrian routes • Site induction for construction staff. The induction will include permitted access routes to and from the construction site for all vehicles, as well as standard environmental, occupational health and safety (OH&S), driver protocols and emergency procedures • Contracts outlining site traffic rules and traffic management requirements • Scheduling of construction vehicles entering and exiting the site via Muir Road.	
TA2	Site-specific TCPs will be prepared as part of the CEMP to outline how construction vehicle manoeuvres will be accommodated in and out of the work site. Temporary traffic controls will be regularly inspected by the contractor to identify potential safety hazards to enable implementation of the correct solutions.	Construction
TA3	An OTMP will be prepared to address the specific traffic control requirements during the operational phase of the Proposal. The plan will assess the provision of traffic control measures, including: • Site signage and road signage • Enforcement of speed limits • Site-internal pedestrian routes • Scheduling processes.	Operation
Air quality and odour		
AQ1	A CEMP, or equivalent, will be prepared for the Proposal to minimise air quality and odour impacts. Where appropriate, mitigation measures to minimise the air quality and odour impacts during construction will be reviewed and considered for incorporation into the CEMP.	Construction
AQ2	An OEMP, or equivalent, will be prepared for the Proposal that will include measures to minimise air quality and odour impacts. Where appropriate, mitigation measures to minimise the air quality and odour impacts during operation will be reviewed and considered for incorporation into the OEMP.	Operation
Water quality and hydrology		
WH1	A CEMP, or equivalent, will be prepared for the Proposal to minimise water and hydrology related impacts and will include the following: • An ESCP prepared in according with the Blue Book (Landcom, 2004) including: – Type and location of erosion and sediment controls – Inspection and maintenance regimes following rainfall events Construction traffic access points. Construction traffic will be restricted to delineated access tracks, and maintained until construction complete	Construction

No.	Mitigation measure	Timing
WH2	A PIRMP and an Emergency Response Plan will be prepared for the Proposal to outline the procedure to be followed in the event of an incident or emergency during construction and operation. The PIRMP will cover the following types of emergency or incident: • On-site spills or leaks • Off-site discharges • Flooding • Fire. The PIRMP will include: • Training and induction protocols. Induction will be provided to all staff and subcontractors outlining their responsibilities in the event of an emergency or incident • Incident response in the case of a fire, including: – Protocols for the containment and disposal of fire water • Notification requirements and timeframes to applicable authorities in the event of an emergency or incident • The location and content of a spill kit. A spill kit will be present on site at all times Review regimes of the PIRMP. Regular reviews and updates will be made for the PIRMP as required.	Construction and operation
WH3	A OEMP, or equivalent, will be prepared for the Proposal to minimise water and hydrology related impacts and will include the management, maintenance and cleaning schedule to ensure that stormwater management system devices are regularly inspected and cleaned.	Operation
WH4	A Flood Emergency Response Plan (FERP) will be developed for operational phase of the Proposal. The FERP would take into consideration, site flooding and broader flood emergency response plans for the Upper Cooks River catchment. The FERP would also include the following: • Identification of an area of safe refuge within the Proposal site that would allow people to wait until hazardous flows have receded and safe evacuation is possible • Identification of a flood warden and other responsible persons • Procedures for warning staff of potential flood danger. The FERP will be completed in conjunction with Council and NSW State Emergency Service (SES).	Operation
Soils and contamination		
SC1	A CEMP, or equivalent, will be prepared for the Proposal to minimise soil and contamination related impacts and will include the following: • Maintenance requirements for erosion and sediment controls established across the Proposal site • A contingency plan for disturbance of unexpected contaminated materials (unexpected finds protocol), such as	Construction

No.	Mitigation measure	Timing
	materials that are odorous, stained or containing anthropogenic materials, that may be encountered during construction • The location and content of a spill kit. A spill kit will be present on site at all times	
SC2	A PIRMP will be prepared for the Proposal to outline the procedure to be followed in the event of a chemical spill or leak during construction and operation. This will include notification requirements and use of absorbent material to contain the spill or leak.	Construction and operation
SC3	An OEMP, or equivalent, will be prepared for the Proposal to minimise contamination related impacts and will include the following: • A refuelling procedure that will be implemented for all refuelling activities undertaken. Any fuel, lubricant or hydraulic fluid spillages will be collected using absorbent material, and contaminated material would be transported to a licensed waste facility for disposal • The location and content of a spill kit. A spill kit will be present on site at all times	Operation
Noise and vibration		
NV1	A CEMP, or equivalent, will be prepared for the Proposal to minimise noise and vibration impacts and will include the following: • Consideration of the selection of plant and processes with reduced noise emissions • A complaint handling process • Induction and training procedures for construction staff. An induction will be provided to relevant staff and sub-contractors outlining their responsibilities with regard to noise • Procedures for approval of any works undertaken outside of standard hours.	Construction
NV2	An OEMP, or equivalent, will be prepared for the Proposal to address noise and vibration impacts. Where appropriate, mitigation measures to minimise the unnecessary generation of noise during operation will be reviewed and considered for incorporation into the OEMP.	Operation
Hazards and risks		
HR1	A CEMP, or equivalent, will be prepared for the Proposal to minimise hazards and risks and will include the following: • Health and safety requirements for construction. Construction works, including the storage, handling and use of hazardous construction materials will be undertaken in accordance with the provisions of the *Work Health and Safety Act 2011* and *Work Health and Safety Regulation 2011.* • Operational access and egress points for emergency service personnel and workers.	Construction

No.	Mitigation measure	Timing
HR2	A PIRMP and an Emergency Response Plan will be prepared for the Proposal to outline the procedure to be followed in the event of an incident or emergency during construction and operation. The PIRMP will be developed collaboratively with the construction contractor and site operator and in consultation with the NSW Police force, NSW Fire Brigade and the Ambulance Service of NSW. Emergency response and incident management protocols will cover the following types of emergency or incident: • Workplace health and safety • On-site spills or leaks • Off-site discharges • Hazardous materials / dangerous goods • Flooding • Road incidents, including incidents involving the transport of dangerous or toxic goods • Fire. The PIRMP will include: • Training and induction protocols. Induction will be provided to all staff and subcontractors outlining their responsibilities in the event of an emergency or incident • Incident response in the case of a fire, including: – Measures to prevent fires on site and for the management of hot loads (fires occurring in transfer vehicles) – Treatment of fires as an emergency. The extinguishment of fires will take precedence over normal operations – Protocols for the containment and disposal of fire water – Maintenance requirements for firefighting equipment. All firefighting equipment will be regularly maintained in accordance with the equipment maintenance specification. Equipment will be replaced as necessary • Notification requirements and timeframes to applicable authorities in the event of an emergency or incident • Non-confirming waste protocols • The location and content of a spill kit. A spill kit will be present on site at all times • Review regimes of the PIRMP. Regular reviews and updates will be made for the PIRMP as required.	Construction and operation
Socio-economic		
SE1	A CEMP and OEMP, or equivalent, will be prepared for the Proposal to minimise social impacts and will include the following: • A consultation strategy outlining measures to maintain communication with the community and all relevant stakeholders throughout construction and operation • A complaint handling procedure. A complaints register will be maintained to manage public complaints regarding odours, vermin, litter, dust and noise	Construction and operation

No.	Mitigation measure	Timing
	• Measures to respond to complaints and feedback received during the construction and operation of the Proposal.	
Biodiversity		
BD1	A CEMP, or equivalent, will be prepared for the Proposal to minimise impacts to biodiversity and will include the following: • Protocols around 'No Go' zones. Prior to commencement of construction, the Proposal site will be delineated from the patch of native vegetation in the north-western corner of the Chullora RRP with fencing to prevent inadvertent damage to the TEC from construction activities. Signage should be attached to the fence identifying the area as a 'No Go Zone' • Environmental constraints maps clearly identifying the locations of threatened ecological communities adjacent to the Proposal boundary • Site induction protocols. Site inductions will include a briefing on local fauna and protocols to be undertaken if fauna are encountered • Requirements for lighting. Where feasible, directional lighting will be used where lighting is required • Consideration of the selection of plant and processes with reduced noise emissions.	Construction
BD2	If any animal is injured, the relevant local wildlife rescue agency (e.g. WIRES) and / or veterinary surgery will be contact as soon as practical. Until the animal can be cared for by a suitably qualified animal handler, if possible, the stress of the animal will be reduced by: • Handling fauna with care and as little as possible • Covering larger animals with a towel or blanket and placing in a large cardboard box • Placing small animals in a cotton bag, tied at the top • Keeping the animal in a quiet, warm, ventilated, and dark location.	Construction and operation
Aboriginal heritage		
AH1	An unexpected finds protocol will be prepared and included in the CEMP and OEMP. This protocol will outline the procedure for managing the identification of items of potential Aboriginal heritage significance during construction and operation. This protocol will include the following requirements: • Works in the vicinity of the item will be required to cease • OEH will be immediately informed to determine the appropriate management strategy • Should items need to be disturbed (exposed, moved, damaged or destroyed), this will not be undertaken until an excavation permit is received under Section 139 of the *Heritage Act 1977.* The duration of this will depend on the integrity and significance of the heritage item.	Construction and operation

No.	Mitigation measure	Timing
Non-Aboriginal heritage		
AH1	An unexpected finds protocol will be prepared and included in the CEMP and OEMP. This protocol will outline the procedure for managing the identification of items of potential Aboriginal heritage significance during construction and operation. This protocol will include the following requirements: • Works in the vicinity of the item will be required to cease • EES Group will be immediately informed to determine the appropriate management strategy • Should items need to be disturbed (exposed, moved, damaged or destroyed), this will not be undertaken until an excavation permit is received under Section 139 of the *Heritage Act 1977.* The duration of this will depend on the integrity and significance of the heritage item.	Construction and operation
Greenhouse gas emissions		
GG1	A CEMP and OEMP, or equivalent, will be prepared for the Proposal to minimise GHG emissions impacts and will include the following: • Inclusion of energy efficiency design aspects, where practicable, in order to reduce energy and fuel consumption • Machinery selection considerations. Fuel efficiency of the construction plant and equipment will be assessed prior to selection, and where practical, equipment with the highest fuel efficiency and which uses lower GHG intensive fuel (e.g. biodiesel) will be used • Factors for considerations for the use of energy-efficient lighting and energy-efficient appliances.	Construction and operation
Visual amenity		
VA1	A CEMP and OEMP, or equivalent, will be prepared for the Proposal to minimise landscape and visual amenity impacts and will include the following: • Locations for equipment and materials storage. All works equipment and material will be contained within designated boundaries of the Proposal site. Where possible, elements within the construction site will be located to minimise visual impacts, including: – Setting back large equipment from site boundaries – Minimising the height and spread of stockpiles, waste, and vehicle parking across the site – Site vehicles will be parked in appropriate locations • Cleaning protocols. Dust and dirt will be regularly cleaned from the road surface. Any graffiti will be promptly removed.	Construction and operation

No.	Mitigation measure	Timing
Waste management		
WM1	A CEMP, or equivalent, will be prepared for the Proposal to minimise waste related impacts and will include the following: • Waste prioritisation. Avoidance and reuse of construction materials will have priority over recycling materials. Recycling of materials will have priority over disposal of materials • Location and number of collections bins. There will be adequate placement of general waste and recycling bins around the Proposal site, with particular emphasis on the lunchroom and site office • Waste management protocols: – Management of any identified hazardous waste streams – Procedures to manage waste streams, including handling, storage, classification, quantification, identification, and tracking – Procedures and targets for reuse and recycling of waste materials • Induction and training procedures for staff. An induction will be provided to relevant staff and sub-contractors outlining their responsibilities with regard to waste management	Construction and operation

Conclusion

Despite no significant impacts being identified for the Proposal, mitigation measures have been prescribed for all environmental issues identified in Chapters 7 to 20 of this EIS. These measures would effectively reduce the impact of residual environmental effects from the Proposal. All measures may be revised in response to public submissions to the EIS and / or design changes following public exhibition of this EIS.

23 ECOLOGICALLY SUSTAINABLE DEVELOPMENT

Summary

An assessment of the Proposals' consistency with the principles of Ecologically Sustainable Development (ESD) has been undertaken and has demonstrated that the four principles of ESD, have been appropriately considered and incorporated into the design, construction and operation of the Proposal.

The Precautionary Principle - The Proposal design and all associated technical studies have been developed in accordance with a precautionary approach to minimise uncertainty and to avoid, minimise, or mitigate potential environmental and social impacts. The EIS identifies mitigation measures and environmental management procedures that would be implemented to minimise and monitor impacts which may occur as a result of uncertainties in the impact assessment. Where a level of uncertainty was identified in the data used for the assessments, a conservative worst-case scenario analysis was undertaken. Subject to the implementation of mitigation measures, these specialist studies did not identify any issues that may cause serious and irreversible environmental damage as a result of the Proposal (refer to Chapter 7 to Chapter 20 and Chapter 22 of this EIS).

Inter-generational equity – The Proposal has been designed to benefit both existing and future generations through the provision of a state-of-the-art waste recovery facility, which will mitigate significant capacity constraints currently impacting the Sydney region and provide advanced recycling processes to build resilience within the current network of recycling facilities. Further, the Proposal would support the diversion of waste from landfill as well as support the NSW Government's policy statement on the Circular Economy.

Conservation of biological diversity and ecological integrity – The design and assessment of the Proposal has been undertaken with the aim of identifying, avoiding, minimising and mitigating impacts on biodiversity. An assessment of the potential impacts to biodiversity and associated proposed mitigation measures has been undertaken (refer to Chapter 13). The Proposal would not have a direct impact on any biodiversity values.

Improved valuation, pricing and incentive mechanisms – While it is often difficult to place a reliable monetary value on the residual, environmental and social effects of the Proposal, the value placed on avoiding and minimising the environmental impacts of the Proposal is demonstrated in the design features incorporated into the Proposal, and the extent of environmental investigations that have been undertaken to inform this EIS. The approach taken for the Proposal has been to manage environmental impacts by identifying appropriate safeguards to mitigate adverse environmental effects and take up environmental enhancement opportunities. The cost of implementing these safeguards has been included in the total Proposal cost, thereby appropriately reflecting the value of environmental resources. A key shift that would be achieved from this Proposal is the transformation of waste into products aligned to meet the requirements of a range of end markets. Further, the Proposal addresses the COAG reform package for processing waste in Australia as opposed to processing waste offshore.

With appropriate mitigation measures as identified throughout this EIS, undertaking the Proposal in the manner proposed is justifiable taking into consideration the principles of ESD.

23.1 Introduction

An assessment of the Proposals' consistency with the principles of Ecologically Sustainable Development (ESD) has been undertaken. The DPIE did not identify any SEARS relating to ESD. However, Sydney Water outlined requirements relating to their authority. These requirements are discussed throughout this Chapter as indicated in Table 23-1.

Table 23-1 Other agency requirements and relevant report sections (ESD)

Aspect	Where addressed
Sydney Water	
The proponent should outline any sustainability initiatives that will minimise/reduce the demand for drinking water, including any alternative water supply and end uses of drinking and non-drinking water that may be proposed, and demonstrate water sensitive urban design (principles are used), and any water conservation measures that are likely to be proposed. This will allow Sydney Water to determine the impact of the proposed development on our existing services and required system capacity to service the development.	Chapter 9 Section 23.2.2 and 23.2.3 Appendix L Water and Hydrology Impact Assessment

The Commonwealth Government refers to ESD as 'using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future can be increased' (Commonwealth Department of the Environment, 1992).

In NSW, the commitment to the concept of environmental sustainability is expressed in current legislation. It is an object of the EP&A Act (Part 1.3(b)) to encourage ESD through the implementation of the four principles of ESD. The four principles of ESD are defined in clause 7(4) of Schedule 2 of the EP&A Regulation as being:

- **Precautionary principle:** namely, that if there are threats of serious or irreversible environmental damage, lack of scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:
  - Careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment
  - An assessment of the risk-weighted consequences of various options.
- **Inter-generational equality:** namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations
- **Conservation of biological and ecological integrity:** namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration
- **Improved valuation, pricing and incentive mechanisms:** namely, that environmental factors should be included in the valuation of assets and services, such as:
  - Polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement
  - The users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste
  - Environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms that enable those best

placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.

The following sections outline how the Proposal is consistent with the principles of ESD.

23.2 Potential impacts

23.2.1 Precautionary principle

The precautionary principle deals with certainty in decision making. It provides that if there are risks of serious or irreversible environmental damage associated with a proposed development, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

The precautionary principle approach has been applied throughout the design and development of the Proposal and all technical studies associated with the Proposal, with the intent to minimise any potential environmental impacts. This included identifying opportunities to avoid and minimise potential impacts to nearby ecologically sensitive areas and sensitive residential receivers.

This EIS details the evaluation of environmental impacts associated with the Proposal. The EIS was prepared adopting a conservative approach, which included assessing the worst-case impacts and scenarios. It has been undertaken using the best available technical information and has adopted best practice environmental standards, goals and measures to minimise environmental risks. The environmental assessment has been undertaken in collaboration with key stakeholders and relevant statutory and agency requirements.

The threat of serious or irreversible environmental damage is the fundamental requirement for implementing the precautionary principle. Potential environmental risks associated with the Proposal were identified during the design development stage of the Proposal, to ensure that an appropriate amount of attention was afforded to minimising potential environmental risk and to ensure sufficient time was available for the preparation of detailed technical specialist reports to support this EIS (refer to Chapter 21 for more information). Technical specialist studies that were undertaken to provide accurate information to assist with the evaluation and development of the Proposal, included:

- Traffic, access and parking (Chapter 7 and Appendix J)
- Air quality (Chapter 8 and Appendix K)
- Stormwater and Flooding (Chapter 9 and Appendix L)
- Geology, Soils and Contamination (Chapter 10)
- Noise and vibration (Chapter 11 and Appendix N)
- Hazards and risks (Chapter 12)
- Socio-economic (Chapter 13 and Appendix O)
- Biodiversity (Chapter 13)
- Aboriginal heritage (Chapter 13 and Appendix Q)
- Non-Aboriginal heritage (Chapter 15.1)
- Greenhouse gas emissions (Chapter 17 and Appendix R)
- Visual amenity (Section 18)
- Waste Management (Chapter 19)
- Cumulative impacts (Chapter 20).

Mitigation measures which have been developed to manage the potential environmental impacts during construction and operation of the Proposal, as identified in these assessments are provided in Chapter 22. Subject to the implementation of these mitigation measures, these specialist studies did not identify any issues that may cause serious and irreversible environmental damage as a result of the Proposal.

23.2.2 Inter-generational equity

Inter-generational equity refers to the premise that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations. The Proposal has been considered in terms of intergenerational equity through its design and the management of potential environmental impacts discussed throughout this EIS.

The Proposal has been designed to benefit both existing and future generations through the provision of a state-of-the-art resource recovery facility, which would mitigate significant capacity constraints currently impacting the Sydney region and provide advanced recycling processes to build resilience within the current network of recycling facilities. Further, the development would provide a high capacity MRF to manage the long term projected increases in waste generation across the Sydney Greater Metropolitan Area which has been identified in a number of NSW strategic planning and policy documents (refer to Chapter 3 of this EIS). The Proposal fulfils these strategic planning goals as a key facility which would provide for localised employment opportunities, increase southwest Sydney's waste processing capacity as well as increasing the quantity of waste diverted from landfill in NSW and addresses the COAG reform package for processing waste in Australia as opposed to processing waste offshore.

Some of the sustainability initiatives incorporated into the design to avoid, minimise or mitigate potential environmental impacts include:

- Sky lights have been included within the design of the MRF to minimise lighting needs during daylight hours. This would reduce electricity consumption and GHG emissions.
- A rainwater harvesting system would be installed as part of the Proposal comprising two rainwater tanks and first flush diverters and filters, minimising water use and potable and non-potable water demand
- Efficient and world class processing machinery is proposed for use in the MRF maximising resource recovery outcomes.

While the Proposal would have some impacts during construction and operation, as outlined throughout this EIS, these impacts are expected to be of a nature or extent that would not inequitably disadvantage any sector of the community or future generations. Mitigation measures have also been identified for the Proposal that would be implemented throughout construction and operation (refer to Section 22, which will result in there being no significant adverse environmental impacts associated with the Proposal.

Overall, the design of the Proposal has incorporated the ESD principle of intergenerational equity through ensuring that the MRF and associated infrastructure can be constructed and operated sustainably to ensure there is no significant on-going impacts on the surrounding community and future generations. The mitigations measures provided in Section 22 of this EIS are reflective of the commitment of SUEZ (as the Proponent) to minimising environmental impacts of the Proposal on the surrounding environment during construction and operation.

23.2.3 Conservation of biological diversity and ecological integrity

This ESD principle stipulates that biological diversity and ecological integrity should be fundamentally considered when assessing the impacts of a Proposal. The design and assessment of the Proposal has been undertaken with the aim of identifying, avoiding, minimising and mitigating impacts on biodiversity.

The Proposal site has been previously extensively disturbed and is located within an industrial precinct. Construction and operational activities of the Proposal are not proposed to directly impact biodiversity, however there is the potential for minor indirect impacts. Avoidance and minimisation measures have been implemented during design of the Proposal to limit indirect impacts to biodiversity.

An assessment of the biodiversity-related impacts associated with the Proposal was undertaken. A summary of the potential impacts to biodiversity during construction and operation of the Proposal is provided in Chapter 13 of this EIS. Database searches were undertaken to State and Commonwealth records of threatened entities and Commonwealth MNES that occur or have the potential to occur within the Proposal site. Field surveys were conducted to provide survey results in accordance with current biodiversity assessment guidelines.

During the construction and operational phases of the Proposal, there is a possibility of very minor indirect impacts to biodiversity. These include:

- Inadvertent impacts on adjacent habitat or vegetation
- Reduced viability of adjacent habitat due to edge effects
- Reduced viability of adjacent habitat due to noise, dust or light spill
- Transport of weeds and pathogens from the site to adjacent vegetation.

With the appropriate mitigation measures implemented, the likelihood of these impacts is significantly reduced, and their affect is minor or negligible.

There are no threatened ecological communities listed under the EPBC Act within the Proposal boundary. No offsets are required for this Proposal.

23.2.4 Improved valuation, pricing and incentive mechanisms

This principle requires that costs to the environment are incorporated or internalised in terms of overall project costs, ensuring that decision making considers the environmental impacts.

Environmental factors have been considered throughout the design development of the Proposal in relation to its construction methodology and operation. As a result, environmental impacts have been avoided or minimised, where possible and mitigation measures as provided in Chapter 22 of this EIS would be implemented during construction and operation of the Proposal to avoid, minimise and mitigate impacts.

While acknowledging that it is often difficult to place a reliable monetary value on the residual, environmental and social effects of the Proposal, the value placed on avoiding and minimising the environmental impacts of the Proposal is demonstrated in the design features incorporated into the Proposal, and the extent of environmental investigations that have been undertaken to inform this EIS.

Further, the Proposal supports the diversion of waste from landfill and the processing of waste in Australia as opposed to processing it overseas. This demonstrates that the Proposal supports the NSW Government policy statement on the Circular Economy as the Proposal aligns with improved sustainability and lessens the environmental impact of waste in Australia.

SUEZ has undertaken an analysis of GHG emissions generated by the Proposal. The measures identified to reduce greenhouse gas emissions would be considered by SUEZ and, if implemented, become a cost to the Proposal that is directly attributed to minimising environmental impacts.

This EIS has examined the environmental consequences of the Proposal and identifies mitigation measures for areas where adverse environmental impacts may occur. The implementation of

mitigation measures represents a capital and/ or operational cost for the Proposal, acting as a valuation in economic terms of environmental resources.

Conclusion

An assessment of the Proposal's consistency with the principles of ESD has been undertaken and has demonstrated the four principles of ESD in relation to the Proposal:

- Precautionary principle
- Inter-generational equity
- Conservation of biological diversity and ecological integrity
- Improved valuation, pricing and incentive mechanisms.

Each principle has been appropriately considered and incorporated into the design of the Proposal, including both the construction and operation phase of the Proposal. With appropriate mitigation measures as have been identified throughout this EIS, undertaking the Proposal in the manner proposed is justifiable taking into consideration the principles of ESD.

24 JUSTIFICATION AND CONCLUSION

Summary

The potential environmental, social and economic impacts, both direct and cumulative, have been identified and thoroughly assessed as part of this EIS. It has been determined through rigorous investigation that the Proposal would results in minimal impacts during construction and operational phases.

The key environmental issues, as identified in the SEARs, which were assessed for the Proposal include: traffic, access and parking; air quality and odour; water quality and hydrology; soils and contamination; noise and vibration; and hazards and risks.

Following interrogation of the key environmental issues of the Proposal it is considered that any potential impacts associated with the Proposal can be satisfactorily mitigated through a range of measures that have been identified within the EIS. In addition, the Proposal has been assessed against – and has been found to be consistent with – the priorities and targets adopted in relevant and draft State plans as well as Government policies and strategies.

The Proposal has been found to be consistent with its objectives and a strong need for the Proposal is evident in the Sydney Market. The Chullora RRP site is considered suitable for the development of the Proposal. The Proposal has also been compared against possible alternatives to further demonstrate the need, suitability and benefits of the Proposal to the local and wider community.

The Proposal would provide significant benefit in terms of providing a sustainable resource recovery facility for residents of Sydney's west, and by creating choice and competition within Sydney for resource recovery. Overall, the EIS concludes that the development proposed is in the public interest and approval is recommended.

24.1 Introduction

This section of the EIS provides a justification for the Proposal and a conclusion to the EIS. The justification is based on the strategic need for the Proposal and how the Proposal would fulfill its objectives. The justification also takes into consideration the objects of the EP&A Act.

24.2 Proposal justification

With recycling capacity at risk of contraction, the rapidly declining landfill capacity and the emergence of a critical requirement to develop local end markets for recycled materials, there is a clear and compelling case for a new MRF developed to meet the specifications of associated end market applications such as the Proposal. The Proposal recognises the conventional recycling "push" model of highly contaminated recyclables to Southeast Asian Markets is no longer acceptable to the community or financially sustainable and that there is a need to focus on finding local solutions that focus on high quality materials, adding value to recovered resources and utilising those materials locally to create truly circular loops.

The Proposal also represents the re-use of an existing industrial site formerly used for waste infrastructure, in an established industrial precinct, thus mitigating the need to develop on a greenfield site.

24.2.1 Proposal objectives

The Proposal, forming part of the overall Chullora RRP, represents critical waste infrastructure that is required to adequately react to the export ban on unrefined recycling streams, facilitate circular economy flows and build the resilience of the local recycling sector. The key objectives of the Proposal, as part of the Chullora RRP, are to:

- Reactivate the Chullora site by establishing a state of the art MRF, increasing the capacity and resilience of the recycling network in Sydney

- Contribute to NSW achieving its resource recovery targets under the NSW Waste and Resource Recovery Strategy 2014-21 (NSW Environmental Protection Authority (EPA), 2014) (WARR Strategy) through recycling and reuse of co-mingled recyclables, paper and cardboard and plastics
- Integrate the Chullora RRP into SUEZ's broader resource recovery network to produce high quality materials that meet the stringent quality criteria of domestic and international markets
- Deliver on the principles of a circular economy through implementation of a pull-through model that conceives of the sorting, reprocessing and specified end uses of processed materials as an integrated, closed loop solution
- Manage potential impacts associated with the construction and operation of the Proposal in an environmentally and socially responsible manner.

24.2.2 Need for the Proposal

The conventional model of recycling that has been historically adopted across Australia is facing considerable disruption and greater vulnerability. This disruption puts recycling outcomes across Australia, including Greater Sydney, at risk. Global market risks, policy drivers and diminishing recycling capacity are all contributing to the need for the Proposal, namely:

- MRF capacity in the MLA is constrained and at risk of decline, compromising the ability to meet NSW Government waste policy goals. If waste generation holds steady at 2017-18 rates until 2021-22, 1.07 million tonnes of MRF capacity would be needed in the MLA just to achieve the MSW resource recovery target of 70 per cent. The additional processing capacity offered by the Proposal both supports the NSW Government policy goal to increase recycling and improves the security of kerbside recycling during a period of significant disruption.
- Global markets are becoming more constrained. International market uncertainty has significantly challenged the conventional recycling model of a basic 'sort and export'. The Proposal is a direct response to these challenges as it adopts a 'pull through' model, which starts by securing local offtake markets in order to define output product specifications and has been designed to meet those requirements.
- The export ban on unrefined materials introduced by the Commonwealth government is promoting investment in materials reprocessing. The Proposal is in strong alignment with the intended ban.
- The introduction of National Packaging Targets by the Commonwealth government will require a major expansion in the recycling rate of plastic packaging, including additional sorting capacity. The Proposal would support delivery of the National Packaging Targets.
- The Proposal supports the emergence of a circular economy within Australia. It demonstrates the critical shift in approach, from producing generic low cost, low grade materials to a pull through model that conceives of the sorting, reprocessing and specified end uses as an integrated, closed loop solution.

The Chullora MRF, forming part of the overall Chullora RRP represents critical infrastructure that will be required to facilitate the export ban on unrefined recycling streams, facilitate circular economy flows and build the resilience of the local recycling sector. In addition, the Proposal supports the objectives of a range of strategic planning policies, including:

- NSW Waste Avoidance and Resource Recovery Strategy 2014-21 (NSW EPA, 2014)
- National Waste Policy: Less Waste, More Resources (Australian Government, 2018)
- NSW 2021: A Plan to Make NSW Number One (NSW Government, 2011)
- Greater Sydney Region Plan: A Metropolis of Three Cities (Greater Sydney Commission, 2018a)
- South District Plan Greater (Sydney Commission, 2018b)
- Canterbury-Bankstown Community Strategic Plan 2028 (Canterbury-Bankstown Council, 2018)
- NSW Circular Economy Policy Statement – Too Good to Waste 2018 (NSW EPA, 2019a)

A range of alternatives have been considered for the Proposal, including a 'Do nothing' scenario, alternatives sites and alternate site configurations and layouts. Each of these alternatives have been discarded as they would not adequately address the Proposal's objectives or address the critical need for the Proposal.

The Proposal would also result in a number of additional benefits during construction and operation, namely:

- Reducing the potential for impacts to the natural environment (e.g. land clearing) compared to a greenfield site by utilising an existing brownfield industrial site in an established industrial precinct for development
- Improved environmental benefits compared to the previous Chullora RRC by providing a state-of the art fully enclosed facility
- Provide direct and indirect economic and social benefits both locally and regionally through:
  - Providing employment for approximately 30 full time staff at a during the 12 month construction period
  - Creating up to 45 FTE positions during the operation of the Proposal
  - Capital investment in the region of up to $54 million, creating the potential for sourcing Proposal resources from regional providers, suppliers and subcontractors.

24.2.3 Site suitability

The Proposal represents a critical piece of waste management infrastructure which would mitigate significant waste capacity constraints currently impacting the Sydney region. The location of the Proposal is well placed geographically to service central Sydney customers and would yield the benefit of previously operating as a waste management facility; formerly the Chullora RRC. The Proposal site is situated in close proximity to key regional transport infrastructure and is of appropriate zoning for an industrial use; being located in zone IN1 – General Industrial. The Proposal site currently has approval for resource recovery activities to be carried out and was certified within a Site Audit Report (Enviroview, 2016) and Site Audit Statement (NSW EPA, 2016a) as being suitable for a commercial / industrial land use. Further, the Proposal would be supported by existing SUEZ infrastructure, including the existing site office.

The Proposal site is therefore considered the optimal location and is suitable for the Proposal.

24.2.4 Proposal alternatives

A number of alternative scenarios to achieve the Proposal objectives were considered. These included:

- **A 'Do nothing' scenario** – Section 24.2.2 clearly identifies the strategic need for the provision of a MRF within the Canterbury-Bankstown LGA in order to enhance the recycling capacity within the Greater Sydney area. A 'do nothing' scenario would not provide the critically needed increase in MRF capacity within the Greater Sydney region. This would be inconsistent with the objectives and goals mandated in these strategic planning frameworks.
- **Alternative site** – The Proposal site currently has approval for resource recovery activities to be carried out within a MRF. The Proposal site is situated in close proximity to key regional transport infrastructure and is of appropriate zoning for an industrial use. Further, the Proposal would be supported by the existing SUEZ infrastructure, and is therefore considered the optimal location for the Proposal
- **Alternate site layout and configuration** – the design of the Proposal has considered a broad range of factors to ensure that the configuration and layout has been optimised whilst minimising impacts to the surrounding environment. The layout of the Proposal is considered the most effective and appropriate design to achieve the Proposal's objectives.

24.2.5 Environmental impacts

The key environmental issues which were assessed for the Proposal include:

- Traffic, access and parking
- Air quality and odour
- Water quality and hydrology
- Soils and contamination
- Noise and vibration
- Hazards and risks.

The TIA assessed the traffic and access impacts associated with the construction and operation of the Proposal. During construction, impacts on the road network peak periods is expected to be minimal and would have no noticeable impact on the local road network. Operation of the Proposal would cause an additional 0-1 second to intersection average delay due to site-generated traffic. Therefore, the Proposal would have an insignificant impact on surrounding road network performance. Traffic generated by the Proposal is not expected to compromise the safety or function of the surrounding road network. Regardless, management measures have been implemented to minimise the likelihood of any impact

An assessment of air quality and odour impacts associated with construction and operation of the Proposal was undertaken. It was determined that dust and odour generated from exhaust emissions, wheel generated dust and the processing of material transfers would have a minor impact on the area surrounding the Proposal site. Management measures such as a misting system, enclosed processing and transfer areas and sealed haul roads have been included within the proposed design to proactively manage the potential for impacts. Additionally, measures to manage air quality related impacts during construction and operation of the Proposal will be documented within CEMP and OEMP.

The water and hydrology assessment for Proposal focused on four key aspects: water quality; water quantity (stormwater); flooding; water use. The construction of the Proposal would have minimal impact due to the limited duration and intensity of construction activities. The design of the Proposal has been considered against these four aspects with an overarching aim to meet the relevant requirement of the Commonwealth, state and local stormwater engineering and modelling guidelines. It was determined that:

- Impacts to water quality would be minimal due to the incorporation of water quality controls incorporated into the design
- Increases to water quantity (stormwater) would not cause significant increases to peak stormwater flows in the Cooks River canal and would not adversely impact surrounding properties
- The Proposal would be constructed on an established earthworks platform 0.5 m above the 1-in-100 year flood level and therefore would have flood immunity
- Water use from the Proposal would be offset by approximately 50 per cent through the capturing and use of rainwater; reducing supply demand from the Proposal on the local water network.

Measures to further manage water quality and hydrology impacts beyond the measures designed into the Proposal are proposed to be included in the CEMP and OEMP.

An assessment of soils and contamination associated with construction and operation of the Proposal was undertaken. The Proposal site was deemed suitable for commercial / industrial use (Enviroview Pty Ltd, 2016) (NSW EPA, 2016a) in 2016 following the implementation of a site remediation action plan. A search of the CLM Act Register revealed the Proposal site is not listed as contaminated land. Any potentially contaminated lands within the Proposal site, including groundwater will have been excavated or capped as part of the recent flood mitigation works (DA 366/2020) and are subsequently not anticipated to be disturbed by the Proposal. The risk of impact to human health and the surrounding environment is considered unlikely, and manageable through the implementation of mitigation measures included in a CEMP. A PIRMP will be implemented during the operational phase of the Proposal to manage spills and leaks in the unlikely event of a spill.

Noise and vibration impacts were considered for three phases of construction and a worst-case operational scenario for the Proposal. The predicted noise levels are only anticipated to exceed the NMLs at one receiver by a marginal amount (one dBA) for only one stage of construction. NO operational exceedances were identified. Construction vibration impacts are considered unlikely. A range of measures to mitigate noise impacts will be incorporated into the CEMP and OEMP.

An assessment of hazards and risks associated with the Proposal identified that while chemicals and dangerous goods would be stored within the site, quantities would not be sufficient to trigger the requirement for a PHA. Potential construction and operational hazards include spills, risk of fire and explosion, health and respiratory impacts, vehicle movements and machinery use, floods and receipt of non-conforming waste. These will be managed through the implementation of operational mitigation measures to minimise hazards and risks, including engineering and administrative controls.

In addition to the key environmental assessments described above, this EIS has also included an assessment of other environmental aspects:

- Social impacts
- Biodiversity
- Aboriginal heritage
- Non-Aboriginal heritage
- GHG emissions
- Visual amenity
- Waste
- Cumulative impacts

It is considered that any potential impacts associated with the Proposal can be satisfactorily mitigated through a range of measures that have been identified within the EIS. In addition, the Proposal has been assessed against – and has been found to be consistent with – the priorities and targets adopted in relevant and draft State plans as well as Government policies and strategies.

24.3 Consistency of the Proposal with relevant legislation and statutory approvals

As discussed above, approval is sought for the Proposal under Part 4, Division 4.7 of the EP&A Act. This is outlined in Table 24-1 below.

Table 24-1 Objective and description of the EP&A Act relating to the Proposal

Objective of the Act	Comment
To encourage the proper management, development and conservation of natural resources, including agricultural land, natural areas, forests, minerals, waters, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment	Overall, the Proposal would manage, develop and conserve natural and artificial resources appropriately through increased resource recovery capacity, and would result in a net social and economic benefit to the wider community. The Proposal represents the effective reuse of a brownfield site which limits the potential impact on natural resources. It would promote economic welfare by providing employment during construction and operation. Potential negative social impacts have been reduced by utilising a site where waste management activities have been carried out since 1997 A range of mitigation measures outlined throughout the EIS have been identified to address potential environmental and socioeconomic impacts.
To encourage the promotion and coordination of the orderly and economic use and development of land	The Proposal promotes the orderly development, coordination and economic use of the land through the construction of a MRF, on a site that previously operated as a resource recovery facility. Throughout its design and assessment processes, the Proposal has considered the cumulative impacts of the various projects that are either proposed or currently underway in the surrounding area.
To encourage the protection, provision and coordination of communication and utility services	The Proposal is designed to minimise the impacts on communication and utilities services identified on the Proposal site. The Proposal does not require the extension or augmentation of the existing communication and utility services in the locality.
To encourage the provision of land for public purposes	The increased recovery rate provided by the Proposal would lead to less waste being sent directly to landfill and reduce the amount of public land used for landfill purposes. Recycling minimises the need for new raw materials to be sourced. In addition, the Proposal would provide resource recovery and waste services to the South-West Sydney region.
To encourage the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats	The Proposal will not directly impact biodiversity. No vegetation or ecological features will be cleared to facilitate the Proposal. One patch of vegetation within the north-western corner of the Chullora RRP, outside of the Proposal site, qualifies as the Endangered Ecological Community (EEC) *Cooks River / Castlereagh Ironbark Forest in the Sydney Basin Bioregion.* This EEC would not be directly impacted by the Proposal and any indirect impacts, although unlikely, will be mitigated through the implementation of control measures during construction and operation. Indirect impacts to biodiversity values from the Proposal will be mitigated through the implementing the following measures: • Delineation of the Proposal site from the EEC in the north-western corner of the Chullora RRP with fencing to prevent inadvertent damage to the TEC from construction activities. • Site inductions which include a briefing regarding the local fauna of the Proposal site and protocols to be undertaken if fauna are encountered

Objective of the Act	Comment
	• Directional lighting to be used where lighting is required in construction areas
To encourage ecologically sustainable development	The principles of ecologically sustainable development have been considered with respect to the development of the Proposal and are discussed in Chapter 23.
To encourage the provision and maintenance of affordable housing	The Proposal is not inconsistent with this objective.
To promote the sharing of the responsibility for environmental planning between the different levels of government in the State	The SSD application would be approved by the State Government. Planning considerations from State and Local Government have been taken into consideration in this EIS.
To provide increased opportunity for public involvement and participation in environmental planning and assessment	Community consultation has been addressed in Chapter 6 of this EIS. The EIS will be placed on public exhibition for a period of not less than 30 days in accordance with Schedule 1 Clause 9 of the EP&A Act.

24.4 Conclusion

The Proposal has been subject to a robust EIS exercise to meet the requirements of the EP&A Regulation 2000 and the SEARs. The potential environmental, social and economic impacts, both direct and cumulative, have been identified and thoroughly assessed as part of this EIS.

The preparation of the EIS has identified and assessed the environmental impacts arising as a result of the Proposal, however, no significant impacts were identified. Identified environmental impacts would be mitigated through the implementation of measures for the construction and operation of the Proposal, which have been included in Chapter 22 of this EIS.

The Proposal has been assessed against, and has been found to be consistent with, the priorities and targets adopted in relevant draft and published State and Council plans, as well as Government policies and strategies. The Proposal would represent critical waste management infrastructure which would mitigate significant waste capacity constraints currently impacting the Sydney region and provide advanced recycling processes to build resilience within the current network of recycling facilities. The Proposal would also promote the principles of a circular economy through implementation of a pull-through model that conceives of the sorting, reprocessing and specified end uses of processed materials as an integrated, closed loop solution.

The Proposal would provide significant benefit in terms of providing a sustainable resource recovery facility for residents of Sydney's west, and by creating choice and competition within Sydney for resource recovery. Overall, the EIS concludes that the development proposed is in the public interest and approval is recommended.

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