ARUP

Cleanaway Operations Pty Ltd

Western Sydney Energy and Resource Recovery Centre

Volume 1 | Environmental Impact Statement

Statement of authorship

Submission of environmental impact statement

Prepared under Division 4.7 of the *NSW Environmental Planning and Assessment Act 1979*.

Address of the land to which the statement relates

Land within the 339 Wallgrove Road, Eastern Creek, Blacktown local government areas as described within this environmental impact statement.

Description of the development to which this statement relates

Construction and operation of the Western Sydney Energy & Resource Recovery Centre (WSERRC).

Environmental impact statement

An environmental impact statement is attached dealing with all matters in line with Division 4.7 of the *NSW Environmental Planning and Assessment Act 1979*, Schedule 2 of the *NSW Environmental Planning and Assessment Regulation 2000* and the Secretary's Environmental Assessment Requirements dated 12 December 2019.

Declaration

We certify that we have prepared the contents of the Environmental Impact Statement in line with Schedule 2 of the *Environmental Planning and Assessment Regulation 2000* and the Secretary's Environmental Assessment Requirements dated 12 December 2019, and that, to the best of our knowledge, the information contained in the Environmental Impact Statement is not false or misleading.

Environmental impact statement prepared by

Name:	Joyanne Manning	Brian Cullinane	Jade Garth
Qualifications:	BE M.EngSc CPEng EngExec	M.Sc Env Sc	B. Env Sc & Mgt
Signature:		Brian Cullinane	Jade Garth
Date:	23rd September 2020	23rd September 2020	23rd September 2020

Executive Summary

WSERRC EIS

Executive Summary

Introduction

Cleanaway and Macquarie Capital are seeking a State Significant Development (SSD) consent for the construction and operation of the Western Sydney Energy and Resource Recovery Centre (WSERRC) (the proposal). The proposal comprises an energy from waste (EfW) facility with associated infrastructure and visitor and education centre.

The proposal will be designed to thermally treat up to 500,000 tonnes per annum (tpa) of residual Municipal Solid Waste (MSW) and residual Commercial and Industrial (C&I) waste streams which would usually be disposed of to landfill. Residual waste is waste that is left over from recycling and resource recovery operations and waste from source separated collections. Source separation involves separating waste into common material streams or categories for separate collection.

Within the NSW Energy from Waste Policy Statement (NSW EfW policy), the Environment Protection Authority (EPA) recognises that EfW can be a valid pathway for the handling/treatment of residual waste where further material recovery through reuse, reprocessing or recycling is not financially or technically feasible. Without an EfW option, the residual waste that this proposal will target and process, would be sent to landfill.

The EfW process would generate up to 58 megawatts (MW) of base load electricity per year, some of which would be used to power the facility itself, with up to 55MW exported to the grid. A proportion of the electricity generated would be categorised as renewable.

In addition to supplying electricity to the grid, there is also potential to supply energy in the form of heat and steam to local industrial users.

The proposal will produce enough energy for over 79,000 homes in Western Sydney, reducing net greenhouse gas emissions by around 390,000tpa CO_2-e – equivalent to taking about 85,000 cars off the road each year.

The proposal will also include a visitor and education centre to help educate and inform the community on the circular economy, recycling, resource recovery and EfW. The intent behind this education is to drive a shift in community thinking and actions around waste management.

The proposal involves the building of all onsite infrastructure needed to support the EfW facility, including site utilities, internal roads, weighbridges, parking and hardstand areas, stormwater infrastructure, fencing and landscaping.

The EfW facility will also include a ferrous metal (metal containing iron) separator to separate and recover the ferrous metals from the ash (referred to as incinerator bottom ash or IBA, a by-product of the EfW process) for recycling and sale to market.

The remaining IBA will be transported to a dedicated offsite IBA processing facility where non-ferrous metals (or secondary metals) recovery may be carried out. The applicant is exploring options to reuse the IBA in construction products. The offsite IBA processing facility, if progressed, will be subject to a separate development application process. Note that other ash by-products from the EfW process, including flue gas treatment residues (FGTr) and boiler fly ash, will be managed offsite using existing infrastructure.

While some residual materials are produced because of the EfW process, including IBA (65,800tpa dry weight, becoming 80,000tpa wet weight after quenching), FGTr (20,000tpa) and boiler fly ash (which is captured with the IBA and FGTr streams), the EfW process typically leads to about 90% reduction in the volume, or 80% reduction in mass (tonnes), of waste that would otherwise go to landfill. If IBA is reused into construction products, this number increases further to about 95% reduction in volume and mass of waste that would otherwise go to landfill.

This proposal will create around 900 direct construction jobs over the 3-year construction period, as well as 700–1200 indirect construction jobs. Moreover, 50 highly skilled jobs would be created locally during operation, supporting the development of new skill sets and employment opportunities in the Western Sydney region.

The applicant is Cleanaway Operations Pty Ltd, on behalf of a joint venture between Cleanaway and Macquarie Capital who are developing the proposal. The proposal site is owned by the Western Sydney Energy & Resource Recovery Centre Pty Ltd (ACN 635 427 262), an entity jointly owned by Cleanaway and Macquarie Capital. Cleanaway is an Australian waste management, recycling and industrial services company. Macquarie Capital is the developer and co-investor in Australia’s first energy and resource recovery centre now being built in Perth.

Proposal objectives

The proposal seeks to meet the following objectives:

- Increase the recovery of valuable resources from residual waste
- Divert waste from landfill, supporting the NSW Government targets for landfill diversion, responsible waste management and reducing the burden of landfills on the environment and communities
- Develop waste management infrastructure close to waste generation sources, reducing waste transport distances and associated environmental impacts
- Develop and operate a facility to international best practice standards that protects the health of people and the environment in the surrounding area
- Develop a facility which integrates the built form into the existing context, including adopting architecture which minimises visual bulk, and provides opportunities to enhance the appearance of the building
- Build trust with the community through ongoing engagement in the planning, design, construction and operation of the EfW facility
- Set up an education resource that raises awareness of the principles of waste management, waste avoidance, the circular economy, recycling, resource recovery and EfW
- Contribute to the economy in Western Sydney by creating direct and indirect skilled employment opportunities, both during construction and long-term
- Provide a source of baseload energy, part of which is categorised as renewable, contributing to NSW Government objectives for energy security and renewable energy.

What is EfW?

For the purpose of this proposal, EfW refers to the recovery of energy through the thermal treatment of residual waste streams, significantly reducing the volume of waste being sent to landfill, while generating baseload energy, part of which is categorised as renewable. Both the NSW EfW policy and the *Protection of the Environment Operations (POEO) Act 1997* define thermal treatment as

‘*the processing of waste by burning, incineration, thermal oxidation, gasification, pyrolysis, plasma or other thermal treatment processes*.’

EfW in NSW context

In New South Wales, demand for EfW is driven by the following:

- Resource recovery targets such as the Waste Avoidance Resource Recovery (WARR) Strategy target to increase the amount of waste diverted from landfill to 75% by 2021 are unlikely to be achieved without EfW. To achieve this target, more than 1.2Mt[1] of materials will need to be recycled when correcting for waste generation and population growth rates. The EPA recognises in the EfW Policy Statement that EfW can be a valid pathway for residual waste where further material recovery through reuse, reprocessing or recycling is not financially or technically feasible.

  In addition, overall waste generation is expected to increase as Sydney's population grows to around 10 million by 2036[2]. Despite waste generation per capita being expected to decrease, population growth will result in more waste, which will need to be managed.
- Declining landfill space at existing landfills and social and environmental concerns limiting the development of new landfills.
- Landfill levies and gate fees supporting the development of waste infrastructure including EfW facilities.
- Community expectations for a higher order use for waste management than landfill.

Proposal site and site suitability

The proposal site is located at 339 Wallgrove Road in Eastern Creek, NSW (Lot 1 DP 1059698), which is in the Blacktown local government area (LGA). The site is in the Wallgrove Precinct of the Western Sydney Parklands (WSP) Plan of Management. **Figure 1** shows the locality of the site relative to Sydney.

The proposal site was selected as the preferred site following a detailed site selection strategy, which considered numerous potential sites throughout the Sydney region. The main factors in determining the final site location included:

- Maximising the separation distances to residential areas
- Zoning of the site
- Access to transport networks
- Proximity to the source of the waste

[1] WARR Strategy, 2014.
[2] http://www.planning.nsw.gov.au/Research-and-Demography/Demography/Population-Projections

- Access to a grid and other utility connections
- Site size and configuration
- Avoidance of protected airspace
- Compatibility with surrounding land uses.

The main reasons for the selection of the site located at 339 Wallgrove Road in Eastern Creek are outlined in the subsequent section.

The site is in a region that is expected to accommodate a significant proportion of the population growth forecast for Sydney, driven in part by the development opportunities created by the Western Sydney Airport and Western Sydney Aerotropolis.

The location of the site in this growth region and close to established waste management infrastructure under the ownership of the applicant such as the Erskine Park Waste Transfer Station minimises the transport distances between the sources of waste, waste processing facilities and the proposal.

Importantly, the location of the site avoids unacceptable impacts on the protected airspace of the Western Sydney Airport.

The proposal site is located around 1km from the nearest residential areas. The risk of future encroachment is reduced by its location in the Western Sydney Parklands and adjacent to the Western Sydney Employment Area, both of which prohibit residential development.

The site is immediately adjacent to the M7, close to power supply infrastructure and is in an area that is used for waste management facilities. It is consistent with the Wallgrove Precinct Plan, part of the Western Sydney Plan of Management, which classifies recycling and renewable energy as future land use opportunities in the Precinct.

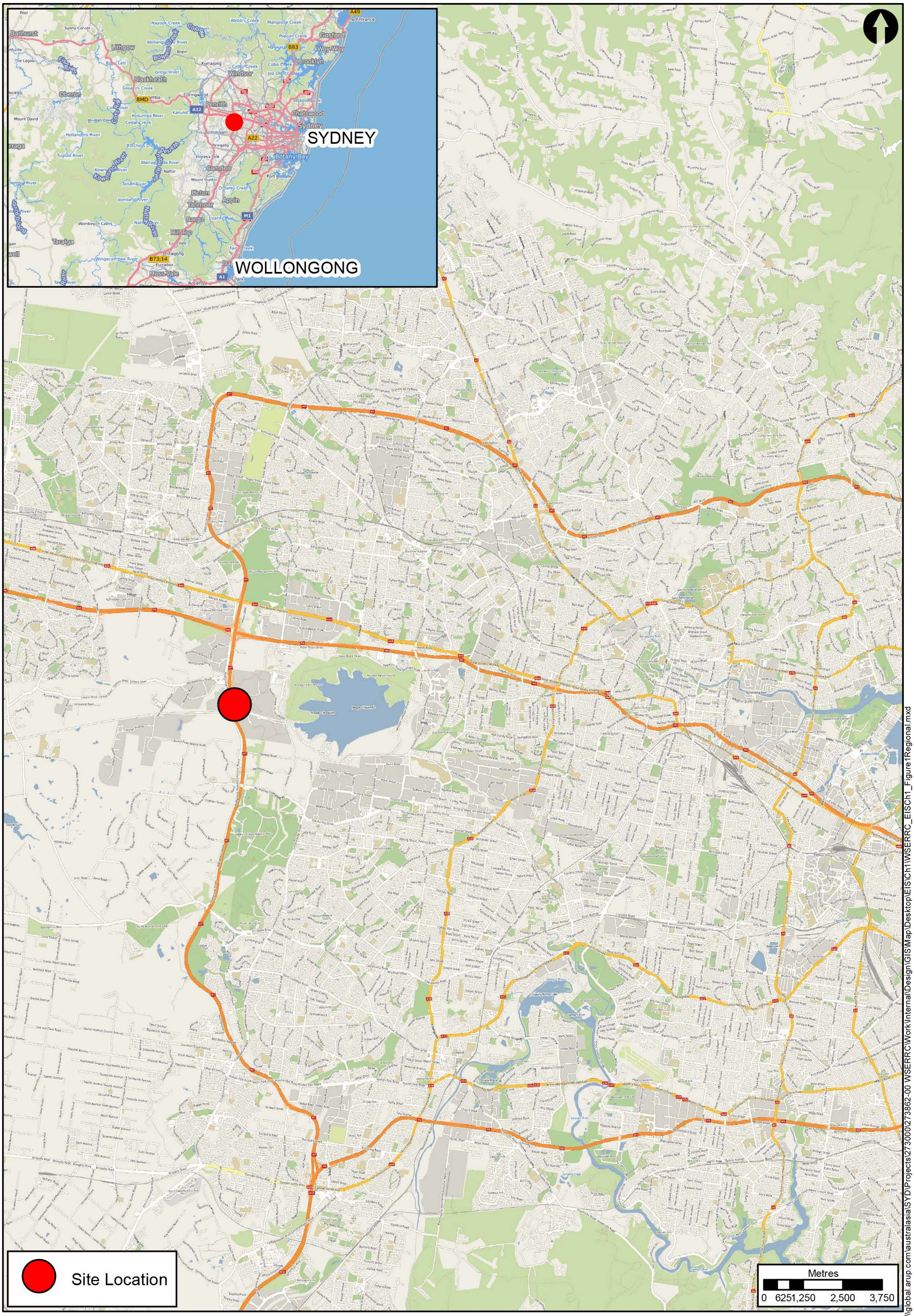
Access to the site is via a dedicated access road at the site's southern boundary, which connects to an unnamed road referred to as the Austral Bricks Road. Austral Bricks Road connects to Wallgrove Road, which in turn connects to the wider road network, including the M7 motorway. The preferred access solution has been agreed in principle with WaterNSW who own the Warragamba pipelines. Ongoing consultation will continue with WaterNSW to agree the detailed design and construction method.

The 8.23ha site is divided by a small strip of land, which does not form part of the proposal site, resulting in a 2.04ha northern section and a 6.19ha southern section as shown in **Figure 2**.

This dividing strip is part of the adjacent lot and includes a right of carriageway, benefitting the proposal site, allowing vehicles to move between the two parts of the site. The proposal area will be fully contained in the 6.19ha southern portion of the site as shown in **Figure 2**.

Works to occur on the 2.04ha northern section of the site include the clearing of weeds and exotic vegetation, and replacement with native species within the existing overland flow path, which is confined to the eastern portion of this parcel of land. The northern section will also be used temporarily to support construction works. It is not currently expected that any other works will occur on the 2.04ha northern section of the site as part of this proposal.

The existing southern portion of the site includes sheds and ancillary buildings associated with a disused poultry facility and storage of wrecked vehicles, all of which will be cleared from the site before starting construction. Currently, two hectares of the northern part of the site are paved.

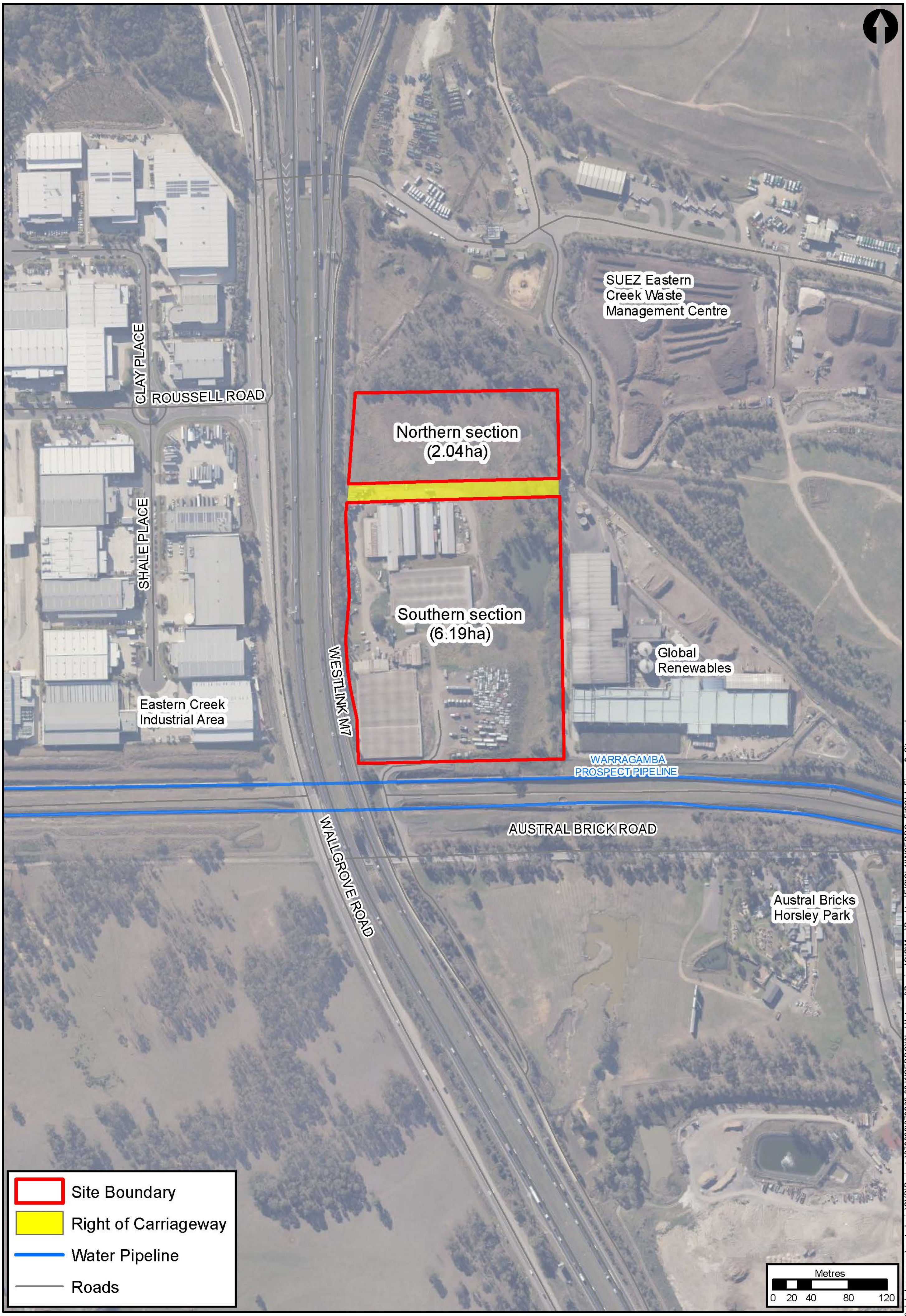


Service Credits: DFSI, 2020, © OpenStreetMap contributors

© Arup 2020

\\global.arup.com\australasia\SYD\Projects\273000\273862-00 WSERRC\Work\Internal\Design\GIS\Map\Desktop\EIS\Ch1\WSERRC_EISCh1_Figure1Regional.mxd

Figure 1: Proposal site location



Service Credits: DFSI, 2020

© Arup 2020

Figure 2: Proposal site boundary

Permissibility

The State Environmental Planning Policy Western Sydney Parklands 2009 (WSP SEPP) is the principal environmental planning instrument (EPI) controlling development and land use planning in the Parklands. All land in the Parklands is unzoned. All forms of private development other than residential or exempt development are permitted with consent. The provisions of specific Local Environmental Plans (LEPs), including the Blacktown LEP 2015, do not apply to the WSP as per clause 6 (1) of the WSP SEPP. The WSERRC would be permissible with consent in the WSP. A decision to grant development consent is available to the consent authority, subject to the application demonstrating the merits of the proposal.

Assessment pathway

The WSERRC will be assessed and determined under Division 4.7 of the *Environmental Planning & Assessment Act 1979* (EP&A Act) because of its classification as SSD.

Clause 20 of Schedule 1 of State Environmental Planning Policy (State and Regional Development) 2011 (SRD SEPP) declares that Electricity Generating Works (EGW), using any energy source, including gas, coal, biofuel, distillate, waste, hydro, wave, solar or wind power, are SSD if they have a capital investment value (CIV) of more than $30m. The estimated CIV for the proposal is around $645m and accordingly WSERRC is SSD for the purposes of Schedule 1 of the SRD SEPP.

As the site is located in the WSP, it is also classified as SSD under Schedule 2 of the SRD SEPP as it is development that has a CIV of more than $10m on land recorded as being within the WSP on the WSP Map within the meaning of State Environmental Planning Policy (Western Sydney Parklands) 2009 (WSP SEPP).

This means the WSERRC would be assessed in line with the provisions of Division 4.7 of Part 4 of the EP&A Act.

The consent authority for SSD is either the Minister for Planning and Public Spaces or the Independent Planning Commission (IPC).

Proposal description

The proposal comprises an EfW facility with associated infrastructure and visitor and education centre.

EfW technology

The selection of the EfW process technology was an important consideration in enabling the proposal to operate safely and within stringent environmental standards. Moving grate technology has been chosen as the means to thermally treat incoming waste to recover energy, given that it is the most recognised and proven technology used globally and has been subject to continual improvement in response to regulatory, industry and public demands. Moving grate is a common form of EfW combustion technology where the waste is fed through the combustion chamber by a travelling grate. The primary function of the moving grate is the controlled transport of the waste through the chamber for the efficient combustion of the waste. A semi-dry system with additional wet scrubber was chosen as the preferred approach for flue gas treatment (cleaning the air emissions) as it readily achieves both the EU and NSW technical and environmental criteria, and because of its ability to future proof against potential tightening of emission limit values.

The NSW EfW policy states that:

'to ensure emissions are below levels that may pose a risk of harm to the community, facilities proposing to recover energy from waste will need to meet current international best practice techniques.'

This proposal has been designed to meet the European Industrial Emissions Directive (IED)[3] and the associated Best Available Techniques Reference[4] (BREF) document which sets the European Union environmental standards for waste incineration as published on 3 December 2019. The EU Commission Implementing Decision (2019/2010) on 12 November 2019 states the best available techniques (BAT) conclusions as the main element of the BREF and prescribes them to be adopted by Member States. Additionally, the facility will comply with the technical criteria set out in the NSW EfW policy. Compliance with the BREF is world's best practice regarding environmental performance of EfW facilities.

[3] Directive 2010/75/EU of the European Parliament https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32010L0075
[4] https://eippcb.jrc.ec.europa.eu/sites/default/files/2020-01/JRC118637_WI_Bref_2019_published_0.pdf

Operation

The proposal will be designed to thermally treat up to 500,000tpa of residual MSW and residual C&I waste streams. This process would generate up to 58MW of base load electricity, some of which would be used to power the facility itself with up to 55MW exported to the grid. A proportion of the electricity generated would be categorised as renewable.

A schematic process diagram of the facility, depicting the main steps in the EfW process, from receipt of waste through to flue gas treatment and residue management, is described in **Figure 3.**

The main operational steps in the EfW process include:

1. Waste delivery
2. Waste receival and storage
3. Combustion process
4. Energy recovery process
5. Flue gas treatment
6. Process residues management.

Site layout

Figure 4 shows the main features of the proposal site.

Architectural approach

The proposed building footprint is designed to be consolidated within the southern section of the site, clustering smaller buildings into one area to limit sprawl, while decreasing in height towards the north and south extents of the site, to minimise negative visual impacts. The physical bulk of the building will be broken down by using vertical blades, which interrupts the large façades, so they are more visually interesting and less bulky, as well as breaks up the mass from key viewing corridors on the M7 in the north and south directions. The northern and southern ends of the building will be covered in living green walls and a green roof on the visitor and education centre, to help blend the proposal into the vegetated backdrop. The landscape design also includes screening around the perimeter of the site, to block direct views and increase density of roadside vegetation.

Construction

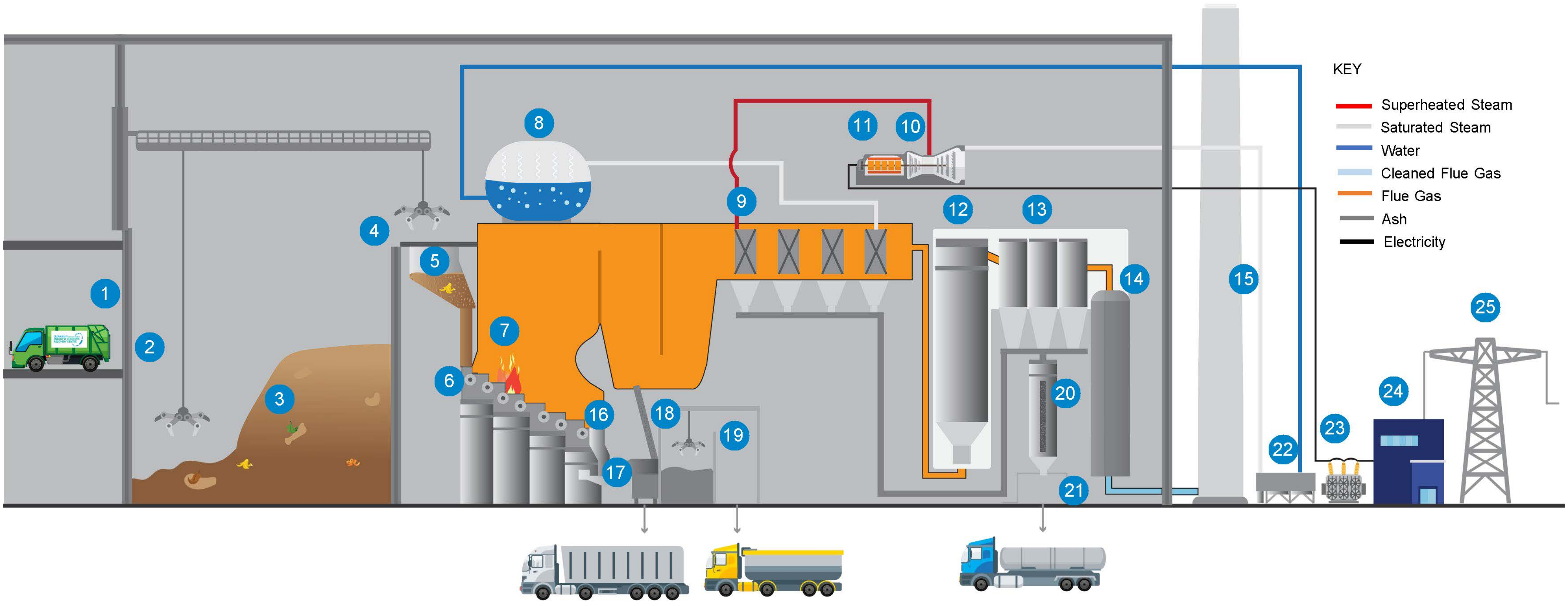
Pending approval, design and construction activities are expected to start in Q4-2021 and it would take up to 3 1/4 years (39 months) to complete, subject to any external unforeseen delays.

The proposal would likely be constructed in five phases to reflect contractor requirements, material and equipment availability, and program and delivery schedules. Building in phases would also allow for effective site and environmental management. The main phases of construction comprise:

- Phase 1: Demolition
- Phase 2: Site establishment and enabling works
- Phase 3: Main construction works
- Phase 4: Testing and commissioning works
- Phase 5: Finishing and landscaping works.

The proposal would be built and managed by a contractor in accordance with an approved Construction Environmental Management Plan (CEMP), prepared in response to the conditions of consent, and in line with relevant safety management requirements. The CEMP will cover environmental performance, management and monitoring requirements supplemented by aspects, such as building demolition, vegetation removal and protection of biodiversity, contamination management, farm dam management, stockpile management, erosion and sediment control and protection of the Warragamba pipeline corridor.

A community management strategy will also be developed through the construction phase, which will include the formation of a Community Reference Group (CRG), contact protocols and engagement strategy with nearby neighbours, residents and businesses.



LEGEND

1	Waste Receiving hall	7	Boiler	13	Bag filters	20	Flue gas treatment residues (FGTr) and boiler fly ash silo
2	Tipping bay	8	Steam drum	14	Wet scrubber	21	FGTr and boiler fly ash collection for treatment and disposal
3	Waste bunker	9	Superheaters	15	Stack	22	Air cooled condenser
4	Waste crane	10	Steam turbine	16	Incinerator bottom ash (IBA) handling	23	Transformer
5	Feed hopper (chute)	11	Generator	17	Ferrous metals recovery	24	Substation
6	Moving grate	12	Semi dry reactor	18	IBA bunker and separate metals bunker	25	Local electricity grid
				19	IBA collection and separate metals collection		

Figure 3: Schematic of the EfW operational process

Figure 4: Proposed facility layout

Energy from Waste policy

The NSW EfW policy recognises that energy recovery is a valid pathway for managing residual waste in circumstances where higher-order material recovery is not possible. It reflects the environmental and human health protection objectives of the *POEO Act* and the resource management objectives of the *Waste Avoidance and Resource Recovery (WARR) Act 2001*.

The NSW EfW policy sets requirements to be addressed by proposed energy recovery proposals in New South Wales, including WSERRC. These include consultation, provision of information, demonstrating best practice and technical performance and resource recovery requirements.

Technology selection and reference facilities

The Dublin EfW facility in Ireland and the Filborna Oresundskraft EfW facility in Sweden are the two reference facilities that have been selected for this proposal as they operate in similar jurisdictions to NSW, use the same technologies and process like waste streams (mixture of MSW and C&I waste). The reference facilities demonstrate that the proposed technology can achieve reliable and acceptable environmental performance, particularly regarding air emissions, resource recovery and management of ash and FGTr from the energy recovery process.

Feedstock availability

A feedstock availability assessment has been completed for the proposal which demonstrates that there is significantly more waste feedstock available in the Sydney Basin than the 500,000tpa design capacity of the WSERRC proposal. These modelling results indicate that the Sydney Basin will generate enough residual waste to support WSERRC and other known EfW facilities proposed in the Sydney Basin, taking into account improvement in source separation and recycling rates over time. In this context, the WSERRC proposal has flexibility to secure waste from both MSW and C&I sources to achieve optimum commercial and energy recovery outcomes.

Waste hierarchy principle and resource recovery criteria

The resource recovery objectives of the NSW EfW policy reflect the priorities of the waste hierarchy and the WARR Act:

1. Avoidance of unnecessary resource consumption
2. Resource recovery (including reuse, reprocessing, recycling and energy recovery)
3. Responsible disposal which protects human and environmental health.

These objectives are translated into specific resource recovery criteria in Table 1 of the NSW EfW policy, with scope for departures from these criteria subject to agreement with the EPA. Achieving the resource recovery criteria is reliant on regulatory and market conditions which can change over time. The provision for NSW EPA discretion within the NSW EfW policy allows flexibility to accommodate changes such as the ban on land application of organics from mixed waste which the NSW EPA implemented in 2018 and confirmed in 2019.

The WSERRC feedstock supply strategy respects the waste hierarchy by applying the following core principles:

1. Support source-separation for high-value recycling
2. Pre-process mixed waste to recover recyclable materials and remove unacceptable waste from the feedstock
3. Divert waste from landfill and recover energy from residual waste which has no other viable outlet.
4. Apply Quality Assurance/Quality Control (QA/QC) procedures to prevent unacceptable waste from being delivered as feedstock to the EfW facility.

To reflect the changed market and regulatory context since the NSW EfW policy was published in 2015, WSERRC has proposed two feedstock scenarios both of which are compliant with the NSW EfW policy.

Supporting source-separation: Scenario 1 and Scenario 2

The WSERRC feedstock strategy targets residual waste from generators that separate recyclable material at source (at the point of waste generation). Source separation is the most desirable outcome as it secures high-quality material for recycling and reduces the need for less efficient processing of mixed residual waste. As permitted under the NSW EfW policy, residual waste from source-separating generators will be accepted for energy recovery without initial processing.

As stated in the NSW EfW policy, adequate source separation of all relevant materials means a 3-bin kerbside collection for households, including a food and garden organics (FOGO) service. For businesses, source separation requirements depend on the types of waste produced and will vary between businesses. As a waste collection service provider, Cleanaway matches waste collection services to businesses' needs and is well-placed to support their business clients in identifying and separating all relevant material streams for recovery.

Cleanaway is committed to actively encouraging uptake of source-separation by both business and councils, across all aspects of their integrated waste collections, recycling and energy recovery services. This includes provision of training and education materials, provision of waste collection services for source-separated materials, and operation and promotion of resource recovery infrastructure in New South Wales.

The WSERRC is designed to accommodate changes in residual waste, including uptake of source separation over time, as illustrated in the long-term feedstock strategy in **Figure 5** and **Figure 6**.

Pre-processing of waste: Scenario 1 and Scenario 2

Waste from generators without adequate source separation could still contain some recyclable materials and must be pre-processed before being received by the WSERRC, as stated in Table 1 of the NSW EfW policy. This pre-processing is likely to be located at Cleanaway's existing Erskine Park Waste Transfer Station and may trigger the need to increase the approved capacity at this facility.

The pre-processing will be in line with best-practice recovery techniques and expects to achieve a 5% recycling rate from mixed MSW and C&I waste streams, based on performance benchmarking of similar facilities. A 5% recycling rate for mixed waste reflects reasonable technically and economically feasible performance in the current regulatory and market context for recovery of organics and dry recyclable materials.

Metals and rigid plastics are the main materials that will be recovered and sold into recycling markets. Optical sorting to extract plastics will also remove PVC, which has a high chlorine content and is undesirable as feedstock for the WSERRC.

Since 2018, land application of organic material sourced from the extraction and recovery of organic material from mixed waste (MWOO) is no longer permitted in New South Wales. This is a significant fraction of mixed MSW and C&I waste, and includes food organics, garden organics and heavily soiled paper and cardboard. As there is no recovery outlet for this material in the current regulatory context, it will not be separated from the mixed waste stream during pre-processing.

The material remaining after pre-processing has a suitable chemical composition and calorific value for energy recovery at the WSERRC and does not have any market outlet for higher-order resource recovery.

EfW eligibility and landfill diversion: Scenario 1

Scenario 1 is consistent with Table 1 of the NSW EfW policy, and is illustrated in **Figure 5**.

Eligibility criteria in Table 1 of the NSW EfW policy impose further limits on waste acceptance as feedstock for energy recovery, beyond the 5% recovery rate which currently represents best practice in mechanical recovery of recyclable materials from mixed waste.

Under this scenario, mixed residual waste which has undergone pre-processing would be directed either to energy recovery at WSERRC or to landfill, with no further processing undertaken for either stream. The maximum quantity of waste eligible under Table 1 of the NSW EfW policy would be directed to the WSERRC for energy recovery. The remaining material would be directed to landfill, as no other outlet is available under current market and regulatory conditions.

EfW eligibility and landfill diversion: Scenario 2

Scenario 2 is consistent with the NSW EfW policy and is illustrated in **Figure 6**. It meets the prescriptive requirements of Table 1 for waste for source separated collections and reflects a future approval to increase the allowable percentage of mixed residual waste which is eligible for energy recovery after pre-processing.

The applicant is seeking an increase to the allowable EfW-eligible fraction of mixed waste which goes through the pre-processing facility to 95% of the mixed waste received for pre-processing. This is permitted through Note 1 to Table 1 of the EfW policy.

This would be relevant to approximately 60% of the WSERRC target feedstock in the short term, decreasing to approximately 20% of WSERRC expected feedstock in the longer term, as both councils and businesses move towards greater source separation. If approved, this increase in EfW-eligibility for pre-processed mixed waste would improve overall landfill diversion without undermining the recovery of valuable materials that have a genuine market outlet. Overall, less mixed waste feedstock would need to be directed through the pre-processing facility, potentially allowing more space for other resource recovery operations at this site and supporting competition in the putrescible waste management market.

The applicant strongly advocates for an increase to EfW-eligibility of waste from generators without adequate source-separation, because in the context of the 2018 ban on land application of MWOO and challenging recycling markets, approximately 95% of this waste stream has no genuine recovery outlet. Recovering energy from this material rather than directing it to landfill is in accordance with the waste hierarchy, which is one of the overarching objectives of the NSW EfW policy and the WARR Act.

Scenario implications for proposed infrastructure

Both Scenario 1 and Scenario 2 are considered viable for this proposal.

Implementation of either Scenario 1 or Scenario 2 will impact the overall throughput at the pre-processing facility. However, it will have no flow-on impact to either the quantity or composition of waste feedstock accepted for energy recovery at the WSERRC.

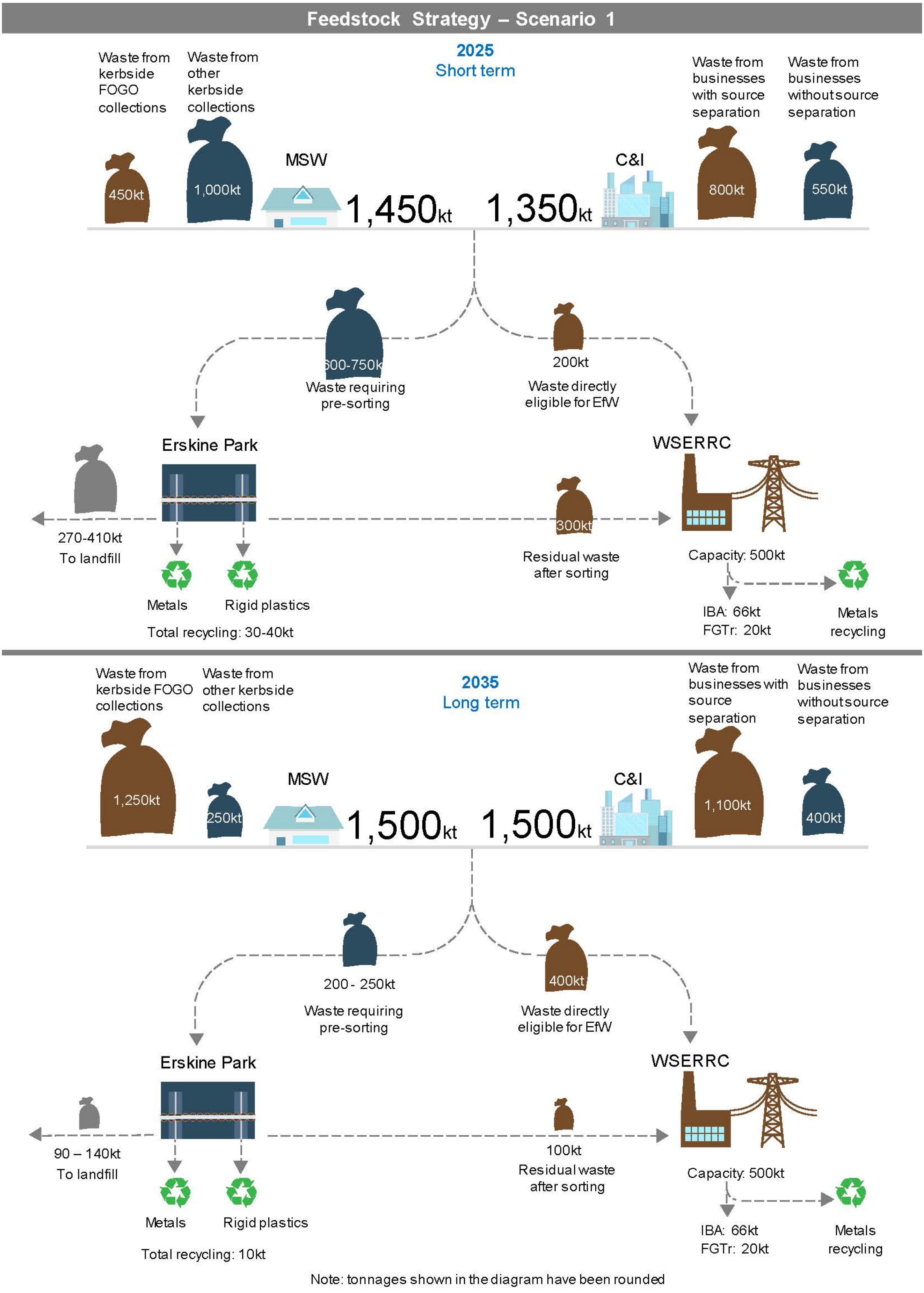


Figure 5: WSERRC feedstock strategy – Scenario 1.

Note 1 exemption not approved.

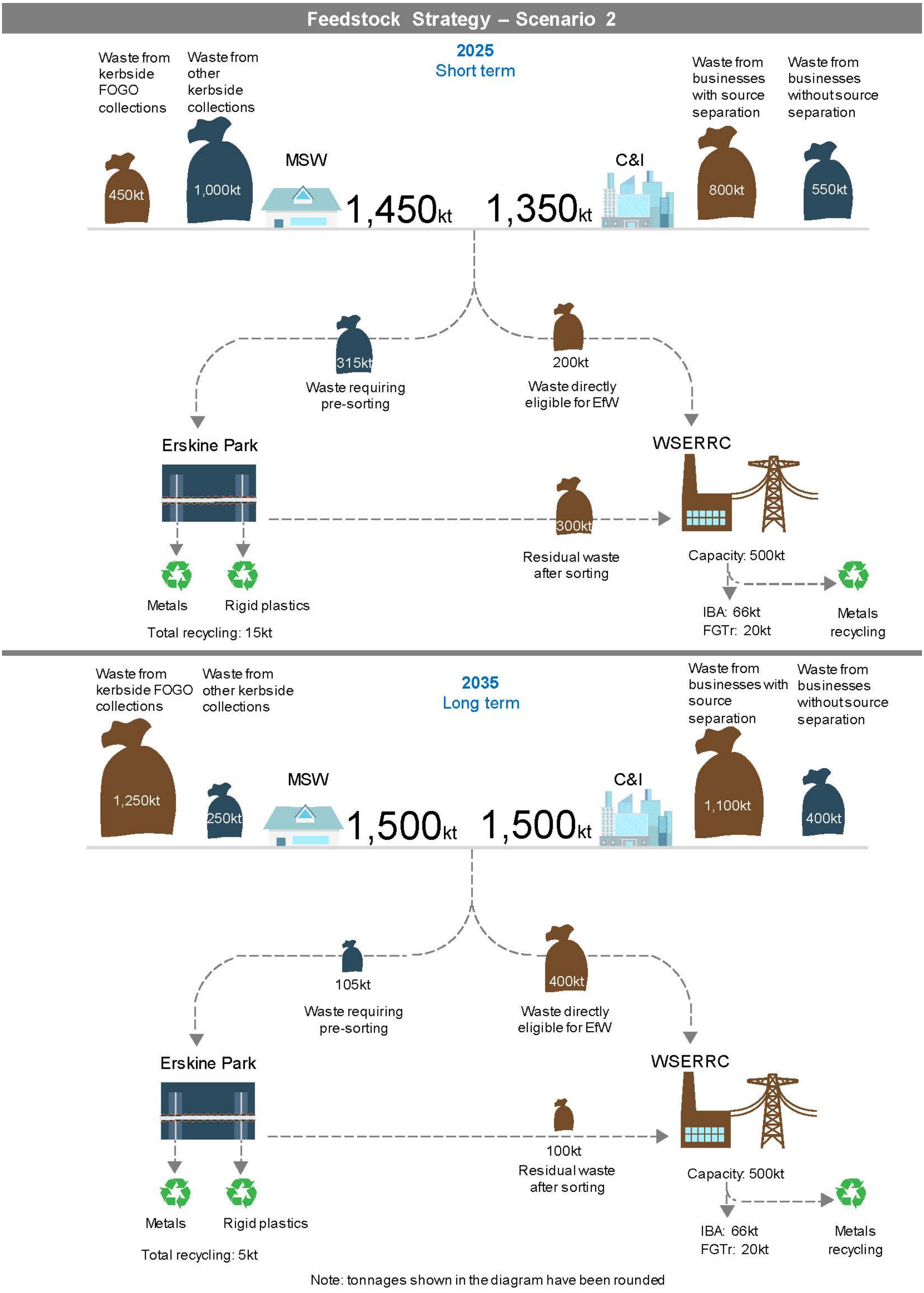


Figure 6: WSERRC feedstock strategy – Scenario 2.

Note 1 exemption approved for the pre-processing of waste from generators with inadequate source separation.

Engagement

The development of the WSERRC proposal has been informed by a comprehensive approach to community and stakeholder engagement, based on a commitment to seeking proactive engagement and building long-term relationships.

In response to questions about engagement preferences, our research found that most respondents would like to be informed about plans for any local EfW facility and prefer engagement that offers:

- Representative community participation with options for different engagement tools (in person, online surveys and other options)
- Readily accessible, clear information without jargon
- Absolute transparency.

The objectives of the communication and stakeholder engagement strategy included:

- **Information**: offer information about the WSERRC that is comprehensive, accessible and trustworthy.
- **Feedback**: actively seek and respond to community and stakeholder views.
- **EIS process**: clearly explain the EIS process and opportunities for community and stakeholder engagement throughout the process.
- **Two-way consultation**: exchange detailed information from technical investigations through discussions with community and stakeholders.

Five key stakeholder groups were selected for engagement:

- **Group 1**: Residents, businesses and community stakeholders closest to the proposal site
- **Group 2**: Residents, businesses and community stakeholders within an 8km radius of the proposal site
- **Group 3**: Residents, businesses and community stakeholders in the wider (Western Sydney) region
- **Group 4**: Australian Government agencies (local, State and Federal)
- **Group 5**: People who, following the project announcement, subsequently registered their interest.

In addition to sharing project information and giving stakeholders an opportunity to engage with the project team, a key focus of the engagement approach was to raise awareness about EfW and its widespread use in recognised waste management systems overseas, as well as discuss the benefits of EfW diverting waste from landfill and recovering valuable resources, including metals and ash.

The engagement process responded to stakeholder feedback and was flexible in its approach.

The main issues of interest to the community were the air quality and human health impacts of the proposal, with requests for additional information on these issues recognised early in the engagement process.

In response, an Air and Health Citizens Panel was formed, with four sessions held during the preparation of the EIS. The sessions gave an opportunity to engage with the community on a complex issue and discuss the community's response to the air quality and health assessment methods.

In response to the 2020 COVID-19 pandemic and associated government restrictions, online engagement tools became more important to continue to meet the engagement objectives of the proposal. For example, the third and fourth Air and Health Citizens Panel sessions were changed from a face-to-face interaction to an online environment that was willingly accepted by participants. Online and virtual interactions are currently being discussed, to continue engagement with stakeholders after lodgement of the EIS.

Ongoing and future consultation

A Community Reference Group (CRG) will be created during construction and function across the life of the proposal. The purpose of the CRG will be to help long-term relationships with the community, providing a forum for genuine discussion around the construction and operation of the facility, community concerns, information requests, and local initiatives and partnerships. In addition to general CRG duties, it is anticipated that the CRG will also manage the allocation of the community funding package (see below) in line with an agreed governance framework. The CRG will be made up of community representatives, local stakeholders and council representatives, and meetings will be facilitated through an independent facilitator. It is likely that this group will be refreshed every two years, to give a variety of community and other stakeholders the opportunity to participate.

If the proposal is approved, a community funding package for Western Sydney is proposed, with the aim of giving back to the community. Funding contributions would total $150,000 per year and, subject to consultation and a decision by the community reference group (CRG), could be allocated towards community-based initiatives, such as the development of local sporting infrastructure, community facilities and environmental areas such as tree plantings.

The visitor and education centre will also play a vital role in engagement, providing information on the role of EfW in managing waste as part of an integrated waste management strategy and a place where visitors can learn about waste avoidance, best-practice recycling and the circular economy.

Impact assessment

The EIS provides consideration of all relevant assessment matters in line with the Secretary's Environmental Assessment Requirements (SEARs) which set the terms of reference for the EIS. Detailed assessments in the form of technical reports are included as Volume 2 to this EIS, with summaries of those assessments presented as impact assessment chapters in Volume 1 of the EIS.

The assessment has concluded that the proposal can operate with limited environmental impacts, considering environmental mitigation measures integrated into the design and operation of the proposal.

The following sub-sections give an overview of the main findings.

Air quality and odour

The construction activities associated with the proposal have the potential to generate dust emissions mainly from the excavation and handling of material, vehicle movements, exhaust emissions from diesel powered equipment and windblown dust generated from exposed areas. The significant dust generating activities associated with construction of the proposal are likely to occur in Phase 1 Demolition and Phase 2 Site Establishment and enabling works.

The construction air quality assessment show minimal incremental effects would arise at the nearest receptor locations which are approximately 1km away. The low incremental predictions at the receptors, when considered with the potential background air quality levels, indicate it is unlikely that any potentially significant cumulative dust impacts associated with the construction activity would occur at any receptor locations. To minimise the effect of activities associated with the construction phase on the surrounding environment, a Dust Management Plan will be developed and implemented as part of the construction phase management activities.

Operation of the EfW facility will produce air emissions from the stack.
The assessment applies conservative estimates for the plant emissions, consistent with the maximum potential levels that might be emitted, thus accounting for any potential variability in the feed waste material affecting the post-treatment emissions that may be released.

All predicted impacts associated with all emissions from the proposal are within the applicable emission limit values and impact assessment criteria, apart from cumulative ground level $PM_{2.5}$ and PM_{10} concentrations, due to the existing background levels which already exceed the criteria (as occurs across much of New South Wales due to regional dust or bushfire events).

However, the predicted contribution by the proposal to ambient $PM_{2.5}$ and PM_{10} concentrations is small and in and of themselves would not result in any discernible or measurable impact.

The assessment covered a range of scenarios, including a cumulative impact assessment incorporating the predicted emissions from other proposals including the Dial a Dump Industries (DADI) Next Generation Proposal, which confirms impacts are within criteria. The odour assessment indicates that odour levels due to the proposal will be at or below the applied odour assessment criteria at all assessed receptors. The waste receiving hall will be fully enclosed, with fast acting roller shutter doors, operating under negative pressure to contain odours from the waste tipping process and the waste bunker. These areas will also have an exhaust system equipped with an active carbon filter for odour control during standstill of the facility, to mitigate odour escaping from the waste bunker and tipping hall if the boilers are not operating.

The proposal uses proven best-practice technology for the thermal treatment of waste and is the only proposed EfW facility in New South Wales for which an EIS has been lodged, that commits to a combination of dry/wet flue gas treatment technology, resulting in significantly lower emissions than possible with only a dry/semi-dry system.

The air quality assessment indicates the proposal would not result in any significant impact upon the surrounding environment or sensitive receptors.

Human health risk

Emissions of dust during construction have the potential to cause impacts on human health receivers if not managed appropriately. Results from both a quantitative and qualitative assessment showed that any impacts on the closest sensitive receivers would be negligible. A range of mitigation measures to control dust will be employed and documented in a Dust Management Plan.

Asbestos has been found on site as described in the contamination impacts summary further below. The draft Remediation Action Plan (RAP) will be finalised and implemented to make sure that any asbestos contaminated material will be managed appropriately to avoid human health impacts on construction workers and surrounding residents.

The human health risk assessment draws the following conclusions:

- No unacceptable risks for criteria pollutants including NO_2, SO_2, CO, $PM_{2.5}$, PM_{10}
- No unacceptable risks for short-term exposures from the proposal at the maximum offsite location. All other locations will have lower concentrations, so risks will be lower.
- No unacceptable risks for relevant exposure scenarios considering long-term exposures at all locations
- No unacceptable risks for relevant exposure scenarios for rainwater tanks or Prospect Reservoir
- No additional health impacts are expected in association with the transport of waste to site.

Waste management

The proposal will generate waste from construction activities and operational site use arising from maintenance, staff amenity spaces and the visitor and education centre.

Waste will be generated at the site during the construction and demolition (C&D) phase of the proposal. C&D waste will be managed according to standard industry practice to prevent environmental degradation and, where possible, recover materials for reuse and recycling. C&D waste management for the proposal is routine and effectively managed through standard industry practice, to be documented in the CEMP and RAP before the start of onsite works. The largest waste streams likely to be generated during the construction phase will be demolition materials from the existing buildings on the site and removal of potentially contaminated soil across the site before the main works begin.

The site will also generate small amounts of operational waste from the site office, visitor and education centre, delivery of consumables and maintenance works. These waste streams will comprise typical commercial and industrial waste. Cleanaway is committed to demonstrating best practice in waste management and resource recovery by putting in place source-separation systems for all relevant operational waste streams. This includes paper and card, comingled recyclables and food organics. An Operational Waste Management Plan (OWMP) will be developed during detailed design.

Given that source separation systems will be in place to support high-value recovery of all relevant waste stream, the residual waste generated by the facility is 100% eligible for energy recovery under the NSW EfW policy. However, it will be transported over the property boundary and enter the facility via the weighbridge before being deposited in the tipping hall.

Residual waste from onsite operations will be subject to the same waste acceptance criteria as waste from external sources.

Soils and water

Soils

The likelihood of erosion on site is high, given the presence of dispersive, highly erodible soils. The predicted impacts on soils will be limited to soil erosion and sediment runoff, which in turn may have the potential to impact the surrounding environment, including Reedy Creek, Eastern Creek and the aquatic communities within it. The soil characteristics onsite will need to be considered in the Sediment and Erosion Control Plan (SECP), as part of the CEMP.

Contamination

When first acquiring the site, it was found that the proposal site had an Individual Biosecurity Direction (IBD) due to the presence of Salmonella Enteritidis (SE) associated with the legacy of poultry farming activities. The owners arranged for cleaning of the site to resolve this IBD and have since received a letter from the Department of Primary Industries (DPI) dated 26 May 2020 which confirmed the site is now considered a ‘resolved premise’ and then the Biosecurity Direction has been revoked.

A detailed site contamination investigation (DSI) has been carried out, which concluded the proposal site is considered to have a low water and vapour contamination risk and a low to moderate risk for soil contamination, mainly in the form of soil asbestos. A draft RAP has been prepared for the site and will be carried out to make the site suitable from a contamination risk perspective for the proposed land use before construction.

Groundwater

Site excavations during construction will impact shallow groundwater only, and it is likely that any drawdown impacts will be limited to groundwater within the site extents. The low permeability of the shales and overlying clays would limit the potential for mobilisation of pollution from the nearby landfill downgradient of the site. As a precautionary measure, groundwater levels and quality will be monitored periodically throughout the construction period.

Monitoring would assess any changes in background groundwater quality conditions from those previously recorded, to find out contaminant level trends and any groundwater impacts.

There are eight groundwater monitoring wells found within 3km of the proposal site. There will be no impact on these wells, given that they are either upgradient from the site or are located far enough away from the site.

Any alteration to groundwater conditions or quality due to the construction activities is not expected to impact nearby surface watercourses, such as Reedy Creek, Eastern Creek and Prospect Reservoir.

The low permeability of the underlying geology means that there is limited potential for surface contamination to reach groundwater. The proposal will be serviced with appropriate sewer and stormwater infrastructure, so any impacts to groundwater quality from surface runoff will be avoided.

The southern part of the site is already largely covered by impermeable surface, and any additional impermeable surfaces will be limited. There are unlikely to be any impacts to groundwater recharge as a result of reduced permeable surface on the site.

The proposed waste bunker will be impermeable and will divert shallow groundwater flow (if any) around the outer extents of the bunker. Given the that the groundwater is shallow and variable across the site, it is unlikely that this will have any material impact. There are no groundwater users close to the site which would be affected.

Hydrology and flooding

The construction and operation of the proposal has the potential to affect the existing hydrology and flooding environment through the construction of new surfaces which change how water moves through the site and risk potential contamination of stormwater. The proposal site is not within the flood plain of Reedy Creek or Eastern Creek, however the overland flow path that runs along the eastern boundary of the site does experience some flooding. Building temporary drainage onsite will be important to safely manage site stormwater runoff and minimise the risk of flooding during construction. All construction compounds and construction access tracks would be located outside of the existing known flood areas. To reduce flooding impacts to the neighbouring Global Renewables site, the existing overland flow path will be maintained but realigned to remove the short section that currently crosses into the Global Renewables site. Realignment will be done early in the construction program, to reduce flood risk at the site during construction.

Water quality can be impacted during construction works from sediment and erosion impacts and dewatering of sedimentation basins. A Sediment and Erosion Management Plan and careful planning during construction regarding clearing, excavation, stockpiling, and filling works will be needed to effectively manage impacts from site runoff.

During operations, two interconnected basins are proposed to manage site stormwater runoff. The eastern portion will act as an onsite detention (OSD) basin and include an outlet structure and emergency overflow spillway. Site stormwater runoff will be discharged from the OSD basin to the overland flow path.

During large rainfall events, stormwater from hardstand areas and overflow from rainwater harvesting tanks will drain to these basins, to avoid both offsite runoff and operation impacts.

Impacts related to runoff from sensitive areas, such as ammonia tanks, the diesel refuelling area and the electrical substation, where there is a risk of chemicals or hydrocarbon spills, will be bunded to prevent an overflow outside the proposal site.

A flood impact assessment has been completed to evaluate potential flooding impacts both on the proposal site and on offsite properties. Flood modelling has demonstrated that the overland flow path and proposed changes to the site topography will not increase flood levels or hazards at neighbouring properties.

Noise and vibration

During construction the proposal may exceed noise standards at nearby residential, commercial and industrial receivers. The predicted noise levels are calculated using a worst-case scenario. The actual construction noise impacts are dependent on the intensity and location of activities, the type of equipment used and background noise levels during the construction period. A detailed Construction Noise and Vibration Management Plan (CNVMP) will be prepared to manage and mitigate construction noise impacts.

It is estimated that the additional traffic on the road network generated by the construction and operation of the proposal would increase noise levels by less than 2dB compared to current background levels, and so would not be audibly noticeable from any sensitive receivers.

There are no structurally sensitive buildings (such as unsound buildings or heritage buildings) located close to the proposal site that would experience any cosmetic or structural damage as a result of the proposed construction activities. Vibration impacts to the Warragamba Pipeline will be avoided by developing and applying a CNVMP, which includes a construction vibration monitoring program.

Noise generated from the operation of the proposal is predicted to comply with noise criteria at all sensitive receivers during standard weather conditions. In enhanced weather conditions where the noise is carried further, a minor exceedance (less than 2dB) during the night-time period is predicted at residential receivers located to the south of the site in Horsley Park. During the detailed design stage, the building envelope and plant and equipment would be designed for the proposal to comply with noise criteria.

Vibration-intensive activities, such as the air-cooled condenser (ACC) and the turbine, will be built with foundations to reduce vibration effects of the equipment and avoid any vibration impacts on nearby receivers during operation of the facility.

Hazard and risk

The proposal will require the use of dangerous goods and will create ash by-products from the EfW process, some of which are categorised as hazardous.

The Preliminary Hazard Assessment (PHA) found that while there would be dangerous goods stored onsite which could be subject to fire, explosion, or toxic release, these dangerous goods are well understood and there are industry standards for storing and managing these goods. The recognised risks can be readily and commonly mitigated, so the proposal does not meet the criteria for a hazardous industry as defined in clause 3 of SEPP33 or as described in the Applying SEPP 33 Guidelines.

While the proposal is a potentially offensive industry as defined by SEPP 33, the proposal is not considered an offensive industry. There are safeguards and mitigation controls in place for the proposal to operate within impact assessment criteria and to be regulated by an EPL, so impacts will not result in a significant level of offence.

Traffic and transport

The proposal will generate additional traffic during construction and operation. The nearest intersections at Wallgrove Road and Austral Bricks Road, and Austral Bricks Road and the site access road were modelled with the anticipated traffic generation from the proposal. Both intersections will maintain their existing level of service during both construction and operation of the proposal.

The design of the proposal incorporates enough vehicle parking to accommodate the parking demand generated from the proposal. Cycle parking and end-of-trip facilities will be arranged, to encourage sustainable transport options for staff. Furthermore, a Green Travel Plan will be prepared and carried out once the proposal is operational to promote sustainable travel.

A draft Construction Traffic Management Plan (CTMP) has been prepared and will be implemented to manage traffic impacts during construction.

Landscape and visual

Landscape character and visual impacts were assessed by considering the potential impacts on various landscape character areas (LCA) and existing viewpoints surrounding the proposal site.

The impacts to landscape character during construction will be concentrated in the area immediately surrounding the site and are consistent with existing industrial activities associated with the surrounding land uses of the area. The visual impacts during construction would be temporary in nature and only visible to people and businesses with direct sightlines of the construction site.

Once operational, the impacts of the proposal on all assessed LCAs will be low to negligible. Except for one LCA identified as the Horsley Park rural residential LCA, which is assessed to have a moderate-low impact. The proposal would result in additional built form near this LCA, including the introduction of the stack and the consequential plume. This would cause the incremental expansion of industrial characteristics that define the northern edge of this LCA. The long-term impacts on character would depend on the regeneration of planting to screen the proposal from this LCA.

The proposal includes large visual elements, such as the stack and plume, which would result in a noticeable change for several viewpoints and as such, a moderate-high visual amenity impact. The impact on these viewpoints is greater where the surrounding landscape has higher sensitivity, being within the Western Sydney Parklands and viewpoints that are in closer to the proposal. Visual impacts are typically reduced with increased distance from the site.

The lighting design is proposed to achieve a dim glow from localised areas of the proposal and will not be directed at building facades, rather it will portray a glow within the building. Viewpoints with an existing high brightness area or further away from the proposal would be less impacted by lighting from the proposal. Those viewpoints which are intrinsically dark (having a high sensitivity) would be more impacted by lighting from the proposal. Overall lighting impacts are assessed to be moderate to negligible for all viewpoints.

The proposal includes design embedded mitigation measures to help mitigate landscape character and visual impacts:

- Architecture design to reduce the bulk and scale of the building
- Careful selection of low-reflective materials
- Incorporation of green walls.

Social

Any negative social impacts during construction and operation of the proposal have been assessed to be medium to very low. These impacts correlate to the anticipated visual, noise, air quality and traffic impacts as outlined in other sections.

The proposal would also have the positive social impact of creating employment and business opportunities along the supply chain during construction and operation. The proposal will allow a shift towards more sustainable initiatives which align with community values and will offer crucial infrastructure for the community.

Relevant mitigation measures for broader impacts associated with noise, air quality, visual and traffic will also help to reduce any social impacts. Specific mitigation for social impacts includes:

- A targeted stakeholder and community engagement strategy and program with regular proposal updates and discussions with sensitive receptors about impacts
- A construction skills and employment strategy to support employment of local people in construction and boost the construction business base in the local study area and wider region.

Greenhouse gas and energy efficiency

Greenhouse gas (GHG) emissions from construction works will be generated through the clearing of vegetation for the proposal footprint and operation of vehicles and machinery during the works. The construction of the proposal would result in the addition of about 4,073t CO_2-e to the atmosphere.

The ongoing operations of the proposal would generate about 321,408t CO_2-e over the first year of operations.

Through the thermal treatment of residual waste, the proposal will generate an equivalent electrical output exported to the grid of 424,000MWh per year. This will reduce in GHG emissions of 310,731t CO_2-e.

The diversion of residual waste which would otherwise be disposed to landfill will reduce methane gases produced during the decomposition process of landfilled waste. Based on the alternative disposal of waste to landfill, equivalent carbon emissions were 401,192tpa CO_2-e.

While the facility will generate GHG emissions, considering factors like export of electricity back to the grid and the diversion of the equivalent waste which would otherwise be sent to landfill, the overall net reduction of GHG emissions will be by around 390,000tpa CO_2-e.

Part of the electricity generated from the proposal qualifies as renewable and displaces fossil fuel-based energy supplied to the grid, which also contributes to emissions reduction. The proposal supports Australia's efforts to mitigate climate change by decreasing GHG emissions and transitioning to a low-carbon economy.

A few energy efficient measures have been considered and incorporated in the design of the proposal, with further measures to be applied during operation of the EfW facility. These measures will maximise resource and energy recovery, thus maximising overall energy efficiency and reducing unnecessary GHG emissions.

Heritage

An Aboriginal Cultural Heritage Assessment Report (ACHAR) has been prepared to assess the impacts of the proposal on Aboriginal heritage. Aboriginal consultation has been conducted as part of this ACHAR process. The assessment found that there are cultural heritage values associated with the general local area. However, as there are no known Aboriginal archaeological sites or areas of Aboriginal archaeological potential within the proposal area, the proposal is unlikely to impact on Aboriginal heritage. The proposal area exhibits a very low sensitivity for Aboriginal archaeological sites and high levels of previous disturbance. The archaeological potential of the proposal area is assessed as very low.

There are no non-Aboriginal heritage features located at the site which could be potentially impacted by the proposal, so there are no potential impacts on non-Aboriginal heritage.

There is potential for Aboriginal heritage elements to be incorporated in detailed design, including, but not limited to plaques, murals, paving, visitor and education centre display.

Utilities and services

During construction, private, internal electrical, water and telecommunication networks serving the existing buildings will be disconnected, where not needed for construction. This will be done before starting demolition works, to avoid impacts to the existing networks.

Construction works will be carried out to avoid impacts on the WaterNSW Warragamba Pipeline Corridor. WaterNSW will be consulted during the design period, to agree on design proposals, mitigation and monitoring measures.

Once operational, the proposal will need energy during start-up operations, water, sewer and telecommunication services. Consultation with the relevant asset holders has confirmed there is enough capacity within their networks to cater for the demand of the proposal.

Biodiversity

Direct impacts from the proposal will result in the removal of 0.45ha of Cumberland Plain Woodland, which is listed as critically endangered under the *NSW Biodiversity Conservation Act 2016* and serves as foraging and marginal roosting habitat for southern myotis listed as vulnerable under the same Act. Site landscaping and restoration of cleared native vegetation communities, ecological communities and impacted aquatic habitats is proposed following construction of the facility to minimise impacts to biodiversity. Proposed restoration works will be carried out consistent with the draft Vegetation Management Plan prepared for this EIS.

Indirect impacts from the proposal could include noise, light and litter impacts, impacts to habitat viability, dust and air quality impacts and impacts from weeds, pests and pathogens. These impacts are negligible with the application of suitable design measures and construction controls.

Potential prescribed impacts associated with the proposal include impacts on the connectivity of habitat, water quality and potential for vehicle strike. With the application of appropriate mitigation measures, the prescribed impacts are considered to be of negligible consequence to biodiversity values within and next to the proposal site.

The proposed realignment of the overland flow path will cause temporary loss of aquatic habitats and displacement of aquatic fauna. However, the riparian corridor will be rebuilt and enhanced after construction, incorporating improvements to stream connectivity and the restoration of riparian vegetation and aquatic habitats.

Related development

This EIS seeks approval for the construction and operation of the WSERRC. A few additional developments offsite, referred to as related development, are needed to support the operation of the WSERRC. These will be assessed and determined through separate approval processes.

Related development projects fall into two planning approval categories: those where Cleanaway applies for development consent under Part 4 of the EP&A Act or those where a public authority approves an activity under Part 5 of the Act.

Although related development will be assessed and determined separately from this proposal, the consent authority still must consider all likely environmental impacts, in line with EP&A Act s.4.15(1)(b)).

The additional projects that comprise related development include:

- A processing facility for the pre-processing of waste before delivery to WSERRC
- An IBA processing and secondary metals recovery facility
- An electrical connection to the high-voltage network
- Water and sewer connections.
- Telecommunications connections
- Site access works.

As the WSERRC related developments are at an early stage in their respective planning processes, an assessment has been completed of the potential environmental impacts of the related developments to the extent these can be predicted at this stage. The assessment has attempted to determine potential impacts associated with related development to the extent possible (noting that sites and locations are not yet known in many cases). The applicant will further progress the relevant related development assessments at the appropriate time.

Cumulative impacts

A qualitative cumulative impact assessment has been completed considering impacts from eight major projects within a 3km radius of the proposal site.

Construction impacts which could result in cumulative impacts include noise, air quality and odour, biodiversity and transport, which may generate social impacts in terms of the change in amenity experienced by people living and working in the surrounding areas. As construction impacts are temporary in nature and can typically be managed with standard construction environmental management measures, they are not considered significant. The site is located away from residential areas and is close to other industrial activities and major transport infrastructure including the M7. These existing land uses influence the general amenity of the area within which the proposal construction impacts would be limited.

Once the proposal is operational, it has the potential to cause cumulative impacts that relate to air quality and consequentially human health impacts, noise, traffic, social and visual impacts. These cumulative impacts are inherently mitigated in the embedded design of the proposal and by operating the proposal in line with required licences and approvals.

The air quality impact assessment also included a quantitative cumulative impact assessment with the predicted emissions from the Next Generation Proposal as required by SEARs. Even with the Next Generation Proposal, the air quality impacts are within criteria.

Mitigation measures

The avoidance and minimisation of environmental impacts has been a key driver in the selection of the site, the choice of EfW technology and the layout and design of the facility.

Inherent mitigation measures have been incorporated into the proposal through site selection, technology chosen and site layout and design. Additional mitigation and management measures are recommended to minimise environmental impacts during construction and operation of the proposal.

Evaluation and conclusions

Through the EIS, the proposal has demonstrated that it is a proven approach to addressing the need to increase the amount of waste diverted from landfill.

Acknowledging that recycling rates need to increase in New South Wales, there will be an ongoing need to manage residual waste. The proposal offers an opportunity to increase the amount of waste diverted from landfill and supports boosting recycling rates through recovery of metals and ash, while New South Wales transitions towards greater source separation of waste, and changes to how products are designed materialise.

The proposal has been sized to offer a viable residual waste management infrastructure solution, while not needing to attract or cannibalise waste that be effectively and economically reused, repaired or recycled.

Importantly, the EIS demonstrates that the proposal can operate within stringent environmental performance standards, including for air quality and human health, by using best available techniques as defined in the EU BREF 2019.

The proposal will also generate a source of baseload energy, part of which is categorised as renewable, and will supply heat and steam to local industrial users.

The proposal acknowledges that while EfW is a recognised and proven approach to waste management in other jurisdictions, it is a relatively new technology for New South Wales, and that the community have concerns about air quality and human health. In response, an Air and Health Citizens Panel was formed to enable a detailed explanation of the approach to the air and health assessments to be provided with an opportunity for the community to seek clarifications from the relevant technical experts. The proposal is committed to continuing its engagement with the community following lodgement of the EIS and through the construction and operation phases.

Table of Contents

Contents

Appendices

Figures

Tables

Technical Reports

Technical Report P: Utilities and services assessment report
Technical Report Q: Biodiversity development assessment report

Glossary

Glossary

Glossary	Definition
Baseload energy	A continuous, stable demand on an electrical grid or continuous, stable operation of a power plant over a span of time.
Best Available Techniques Reference Document	European Commission, Best Available Techniques (BAT) Reference Document for Waste Incineration adopted under both the European Integrated Pollution Prevention and Control (IPPC) Directive (2008/1EC) and the Industrial Emissions Directive (IED 2010/75/EU) to guide the development of industrial facilities covered by the Industrial Emissions Directive (IED) in the European Union (EU). The BAT reference document (BREF) informs the relevant decision makers about what may be technically and economically available to industry in order to improve environmental performance. The latest version published in December 2019 has been used.
Boiler fly ash	Ash from boiler hoppers. Fine granular material; typically, agglomerations of particles.
Calorific value	The energy contained in a fuel, determined by measuring the heat produced by the complete combustion of a specified quantity of the fuel.
Commercial and industrial (C&I) waste	Solid waste (putrescible and non-putrescible) generated by businesses, industries (including shopping centres, restaurants and offices) and institutions (such as schools, hospitals and government offices).
Community Reference Group	A Community Reference Group (CRG) will be established during construction and function across the life of the proposal. The purpose of the CRG will be to facilitate long-term relationships with the community, providing a forum for genuine discussion of construction and operation of the facility, community concerns, information requests, and local initiatives and partnerships. In addition to general CRG duties, it is anticipated that the CRG will also manage the allocation of the community funding package in line with an agreed governance framework. The CRG will be made up of community representatives, local stakeholders and council representatives, and meetings will be facilitated independently. It is likely that this group will be refreshed every two years to ensure that a variety of community and other stakeholders are given the opportunity to participate.
Detailed Design	This proposal has commented in places that future work will be done during detailed design. Detailed design will be conducted by the chosen contractor and adds the relevant engineering detail that cannot be finalised at this stage of the proposal. The detailed design will and must adhere to the principles set forth in this EIS, so the detailed design process cannot and will not change the conclusions reached in this EIS.
Eligible waste fuels	Waste or waste-derived materials considered by the Environmental Protection Authority (EPA) to pose a low risk of harm to the environment and human health due to their origin, low levels of contaminants and consistency over time.
Energy from waste (EfW)	The process of generating energy in the form of electricity and/or heat from the treatment or processing of waste into a fuel source. EfW is a form of resource recovery.

Glossary	Definition
Energy Recovery Facility	Defined in the NSW Energy from Waste Policy Statement as: 'a facility that thermally treats a waste or waste-derived material that does not meet the definition of an eligible waste fuel.' These facilities must be able to demonstrate that they will be using current international best practice techniques.
Flue gas	Flue gas (sometimes called exhaust gas or stack gas) is the gas that emanates from combustion plants and which contains the reaction products of fuel and combustion air and residual substances.
Flue gas treatment residues (FGTr)	A fine-grained powder known as one of the residual products from EfW facilities. Flue gas treatment is one of the main steps in the EfW process. The cooled flue gases leaving the boiler pass through a series of scrubbing and cleaning processes, which comprise the Flue Gas Treatment (FGT) system and are designed to meet best available technology emissions standards. The FGT system produces FGTr at the end of this process which is formed of a mixture of entrained ash and spent treatment consumables (lime and activated carbon).
Incinerator Bottom Ash (IBA)	Ash from the end of the grate and from the incombustible siftings that pass through the gate. Granular material; typically contains glass, ceramics, silicates, rocks, masonry products and carbon/organics. Typically contains some ferrous and non-ferrous metals, which can be extracted for recycling.
Industrial Emissions Directive	European Parliament and Council, Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control). The Industrial Emissions Directive is a European Union Directive which commits European Union member states to control and reduce the impact of industrial emissions on the environment.
Metropolitan Levy Area	Metropolitan Levy Area comprises the Sydney metropolitan area, the Illawarra region and Hunter region.
Minister	Minister for Planning and Public Spaces.
Moving grate	Moving grate is a common form of EfW combustion technology where the waste is fed through the combustion chamber by a travelling grate. The main function of the moving grate is the controlled transport of the waste through the combustion chamber to ensure efficient combustion of the waste at the optimum rate of combustion.
Municipal Solid Waste (MSW)	Solid waste (putrescible and non-putrescible) from households and local government operations, including waste placed at the kerbside for local council collection and waste collected by councils from municipal parks and gardens, street sweepings and public council bins.
Putrescible waste	Solid waste that contains organic material capable of being decomposed by micro-organisms and cause odours.

Glossary	Definition
Renewable energy	Energy collected from naturally replenishing resources such as sunlight, wind, rain, tides, waves, and geothermal heat. Under the Small-scale Renewable Energy Scheme, eligible small-scale renewable energy systems may be entitled to small-scale technology certificates, which can be sold to recoup a portion of the cost of purchasing and installing the system. Small-scale renewable systems which may be eligible for certificates include: • Solar photovoltaic (PV) panels • Wind turbines • Hydro systems • Solar water heaters, and • Air source heat pumps.
Residual C&I	Waste that is left over following the recycling and recovery of resources from the C&I waste stream. Residual C&I is a feedstock for the EfW facility.
Residual MSW	Waste that is left over following the recycling and recovery of resources from the MSW waste stream. Residual MSW is a feedstock for the EfW facility.
Secretary's Environmental Assessment Requirements (SEARs)	The issues to be discussed and the information to be provided in an EIS. SEARs are prepared by the Planning Secretary in consultation with public authorities.
Selective Non-Catalytic Reduction (SNCR)	SNCR is a method to reduce nitrogen oxide emissions in the combustion process. It involves injecting either ammonia or urea into the boiler to react with the nitrogen oxides formed in the combustion process.
Source separated collections	Source separation involves separating waste into common material streams or categories for separate collection.
The proposal	The Western Sydney Energy & Resource Recovery Centre

Abbreviations

Abbreviations

Abbreviation	Definition
-	Minus
%	Percent
@	At
+	Plus
°C	Degrees Celsius
AC	Alternating Current
ACC	Air Cooled Condenser
ACHAR	Aboriginal Cultural Heritage Assessment Report
ACM	Asbestos Containing Material
AEMO	Australian Energy Market Operator
AGO	Australian Greenhouse Office
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information Management System
ANZECC	Australian and New Zealand Environment and Conservation Council
APCr	Air Pollution Control residues
AQOIA	Air Quality and Odour Impact Assessment
As	Arsenic
ASS	Acid Sulfate Soils
AWT	Alternative Waste Treatment
BAM	Biodiversity Assessment Method
BAT	Best Available Techniques
BCC	Blacktown City Council
BDAR	Biodiversity Development Assessment Report
BoM	Bureau of Meteorology
BoP	Balance of Plant
BREF	Best Available Techniques Reference Document
C&D	Construction and Demolition
C&I	Commercial and Industrial
C&I Waste	Commercial and Industrial Waste
CASA	Civil Aviation Safety Authority
CCTV	Closed Circuit Television
Cd	Cadmium
CDS	Container Deposit Scheme
CEMP	Construction Environmental Management Plan

Abbreviation	Definition
CEMS	Continuous Emissions Monitoring System
CFA	Continuous Flight Auger
CHP	Combined Heat and Power
CIV	Capital Investment Value
CMS	Control and Monitoring System
CNVMP	Construction Noise and Vibration Management Plan
CO	Carbon monoxide
Co	Cobalt
CO_2-e	Carbon dioxide equivalent
Cr	Chromium
CRG	Community Reference Group
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CTMP	Construction Traffic Management Plan
Cu	Copper
CV	Calorific Value
DA	Development Application
DADI	Dial A Dump Industries
DAWE	Department of Agriculture, Water and the Environment
dB	Decibel
DBYD	Dial-Before-You-Dig
DC	Direct Current
DCS	Distributed Control System
DER	Distributed Energy Resources
DoEE	Department of Environment and Energy
DoISER	Department of Industry, Science, Energy and Resources
DPIE	Department of Planning, Industry and Environment
DSI	Detailed Site Investigation
EfW	Energy from Waste
EGW	Electricity Generating Works
EIS	Environmental Impact Statement
ELV	Emission Limit Values
EPA	Environment Protection Authority
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
EPC	Engineering, Procurement and Construction
EPL	Environment Protection Licence
ERF	Energy Recovery Facility
ESCP	Erosion and Sediment Control Plan

Abbreviation	Definition
EU	European Union
EWC	European Waste Catalogue
FAQ	Frequently Asked Questions
FEED	Front End Engineering Design
FEL	Front End Loaders
FGT	Flue Gas Treatment
FGTr	Flue Gas Treatment residues
FOGO	Food Organics and Garden Organic waste
FTTP	Fibre to the Premises
GDE	Groundwater Dependent Ecosystems
GHG	Greenhouse Gas
HCL	Hydrogen Chloride
HCV	Higher Calorific Value
HDPE	High-density Polyethylene
HEV	High Ecological Value
HF	Hydrogen Fluoride
Hg	Mercury
HGV	Heavy Goods Vehicles
HHRA	Human Health Risk Assessment
hpa	Hours per annum
HSE	Health, Safety and the Environment
HV	High Voltage
HZI	Hitachi Zosen Inova
I/O	Input/Output
IAP2	International Association for Public Participation
IBA	Incineration Bottom Ash
IBRA	Sydney Basin Interim Biogeographic Regionalisation for Australia
ICNG	Interim Construction Noise Guideline
ICOMOS	International Council on Monuments and Sites
ID	Induced Draft
IEC	International Electrotechnical Commission
IED	Industrial Emissions Directive
ILUA	Indigenous Land Use Agreement
IPC	Independent Planning Commission
IPCC	Intergovernmental Panel on Climate Change
kg	Kilogram
kV	Kilovolts

Abbreviation	Definition
LCA	Landscape Character Area
LCV	Lower Calorific Value
LEC	Land and Environment Court
LEP	Local Environment Plan
LGA	Local Government Area
LGC	Large-scale Generation Certificates
LOI	Loss on Ignition
LRET	Large-scale Renewable Energy Target
LV	Low Voltage
LVIA	Landscape and Visual Impact Assessment
m	Meters
m/s	Meters per second
m^2	Meters squared
m^3	Meters cubed
mbar	Milli-bar
MBT	Mechanical-Biological Treatment
MC	Moisture Content
mg	Milligrams
MJ	Mega Joules
MLA	Metropolitan Levy Area
Mn	Manganese
MNES	Matters of National Environmental Significance
MSW	Municipal Solid Waste
Mtpa	Million tonnes per annum
MVA	Mega Volt Amps
MW	Mega-Watt
MWh	Mega-Watt hours
MWOO	Mixed Waste Organic Outputs
n	Nominal
NaOH	Sodium Hydroxide
NARCliM	NSW and ACT Regional Climate Modelling
NASF	National Airports Safeguarding Framework
NCV	Net Calorific Value
NGA	National Greenhouse Accounts
NH_3	Ammonia
Ni	Nickel
NO_2	Nitrogen Dioxide

Abbreviation	Definition
NorBe	Neutral or Beneficial Effect
NorBI	Neutral or Beneficial Impact
NO	Nitrogen Oxide
NSW	New South Wales
OEM	Original Equipment Manufacturer
OLS	Obstacle Limitation Surfaces
OSD	Onsite Detention
PANS-OPS	Procedures for Air Navigational Services – Aircraft Operations
Pb	Lead
PCB	Polychlorinated Biphenyl
PCDD/F	Polychlorinated Dibenzodioxins and Furans
PCT	Plant Community Type
PDB	Project Definition Brief
PEF	Processed Engineered Fuel
PET	Polyethylene Terephthalate
PFM	Planning Focus Meeting
PHA	Preliminary Hazard Assessment
PIRMP	Pollution Incident Response Management Plan
PM	Particulate matter
PMF	Probable Maximum Flood
PMST	Protected Matters Search Tool
POEO	Protection of the Environment Operations
PoP	Proof of Performance
Q	Quarter
RAP	Remediation Action Plan
RBL	Rating Background Level
RDF	Refuse Derived Fuel
RMS	Roads and Maritime Services
RRF	Resource Recovery Facility
RSD	Regionally Significant Development
SAII	Serious and Irreversible Impacts
Sb	Antimony
SCR	Selective Catalytic Reduction
SEARs	Secretary’s Environmental Assessment Requirements
SEI	Stream Erosion Index
SEPP	State Environmental Planning Policy
SHR	State Heritage Register

Abbreviation	Definition
SIPLEP	Standard Instrument Principal Local Environmental Plan
SNCR	Selective Non-Catalytic Reduction
SO_2	Sulphur dioxide
SRD	State and Regional Development
SRF	Solid Recovered Fuel
SSD	State Significant Development
t	Tonnes
TEC	Threatened Ecological Community
Tl	Thallium
TOC	Total Organic Carbon
tpa	Tonnes per annum
tph	Tonnes per hour
TVOC	Total Volatile Organic Compounds
UGOH	Underground to Overhead
UK	United Kingdom
UPS	Uninterruptable Power Supply
V	Vanadium
v	Volt
VC	Vitrified Clay
VEM	Visual Envelope Map
VENM	Virgin Excavated Natural Material
VMP	Vegetation Management Plan
VPA	Voluntary Planning Agreement
WI	Waste Incineration
WI BREF	Waste Incineration Best Available Techniques Reference Document
WMP	Waste Management Plan
WRMF	Waste or Resource Management Facility
WSERRC	Western Sydney Energy and Resource Recovery Centre
WSP	Western Sydney Parklands

Chapter 1

Introduction

1 Introduction

1.1 Proposal overview

Cleanaway and Macquarie Capital are jointly developing an energy-from-waste (EfW) facility known as the Western Sydney Energy and Resource Recovery Centre (WSERRC) (the proposal).

The proposal will be designed to thermally treat up to 500,000tpa of residual Municipal Solid Waste (MSW) and residual Commercial and Industrial (C&I) waste streams that would otherwise be sent to landfill. This process would generate up to 58MW of base load electricity some of which would be used to power the facility itself with up to 55MW exported to the grid. A proportion of the electricity generated would be categorised as renewable. The proposal involves the building of all onsite infrastructure needed to support the facility including site utilities, internal roads, weighbridges, parking and hardstand areas, storm water infrastructure, fencing and landscaping.

The waste feedstock received at the facility will include residual waste that is left over from offsite recycling and resource recovery operations and waste from source separated collections. Source separation involves separating waste into common material streams or categories for separate collection. Waste that is not source separated will be pre-sorted to recover materials for recycling with the residual waste sent as a waste feedstock to the EfW facility.

The NSW Environment Protection Authority (EPA) recognises in the NSW Energy from Waste Policy Statement (NSW EfW policy) that the recovery of energy and resources from the thermal processing of waste has the potential, as part of an integrated waste management strategy, to deliver positive outcomes for the community and the environment. It also notes that EfW can be a valid pathway for residual waste where further material recovery through reuse, reprocessing or recycling is not financially or technically feasible. Without an EfW option, the residual waste that this proposal will target and process, would be sent to landfill.

Whilst some residual materials are produced because of the EfW process, including incinerator bottom ash (IBA), boiler fly ash and flue gas treatment residues (FGTr), the EfW process typically leads to about 90% reduction in the volume, or 80% reduction in mass (tonnes), of waste that would otherwise go to landfill. If IBA is reused into construction products, this number increases further to about 95% reduction in volume and mass of waste that would otherwise go to landfill. However, diversion from landfill will be dependent on the classification and fate of the wastes generated by the EfW facility.

The EfW facility will also include a ferrous metal separator to recover ferrous metals from the IBA for recycling and sale to market. The remaining IBA will be transported to a dedicated offsite IBA storage, treatment, metal recovery and maturation facility where non-ferrous metals (or secondary metals) recovery will be carried out.

Options to reuse the ash in construction products are currently being explored. The offsite IBA storage and secondary metals recovery facility does not form part of this proposal and will be subject to a separate development application process which is discussed further in **Chapter 22 Related development**.

As well as diverting waste from landfill, the proposal will enhance energy security for New South Wales by providing a base load energy source, part of which is categorised as renewable, and an alternative to traditional fossil fuel generation. In addition to supplying electricity to the grid, there is also potential to supply energy in the form of heat and steam to local industrial users. The proposal will produce enough energy for over 79,000 homes in Western Sydney, reducing net greenhouse gas emissions by around 390,000t of CO_2-e per year, equivalent to taking approximately 85,000 cars off the road each year – refer to **Technical report N Greenhouse Gas and Energy Efficiency Assessment Report**.

The proposal will also include a visitor and education centre to help educate and inform the community on the circular economy, recycling, resource recovery and EfW.

The proposal will use established and proven EfW technology. Moving grate technology has been chosen as the means to thermally treat incoming waste to recover energy and advanced flue gas treatment (FGT) technology would be applied so that air emissions will meet stringent emission standards and current international best-practice techniques. Moving grate is a common form of EfW combustion technology where the waste is fed through the combustion chamber by a travelling grate. The primary function of the moving grate is the controlled transport of the waste through the chamber for efficient combustion of the waste. Moving grate technology has been used globally for over 50 years, and in that time the technology has been subject to continual improvement responding to regulatory, industry and public demands. There are about 500 similar operational examples across Europe alone using the same technology being proposed for the WSERRC.[1]

Flue gas treatment technologies have also seen continuous improvements in their ability to achieve ever more stringent emissions standards.

---

[1] Confederation of European Waste-to-Energy Plants, 2019.

The NSW EfW policy states that *'to ensure emissions are below levels that may pose a risk of harm to the community, facilities proposing to recover energy from waste will need to meet current international best-practice techniques.'*

This proposal has been designed to meet the European Industrial Emissions Directive (IED)[2] and the associated Best Available Techniques Reference[3] (BREF) document which sets the European Union environmental standards for waste incineration as published on 3 December 2019. The EU Commission Implementing Decision (2019/2010) on 12 November 2019 states the best available techniques (BAT) conclusions as the main element of the BREF and prescribes them to be adopted by Member States. Additionally, the facility will comply with the technical criteria set out in the NSW EfW policy – refer to **Chapter 5 EfW policy**.

Several additional projects, referred to as related development, are required to support the operation of the WSERRC. These will be assessed and determined through separate approval processes and are not part of the scope of the proposal. The additional projects that comprise related development include:

- Processing facility for the pre-processing of waste before delivery to the WSERRC
- IBA processing and secondary metals recovery facility
- An electrical connection to the high-voltage network
- Water and sewer connections
- Telecommunications connections
- Site access works.

1.2 Proposal objectives

The proposal seeks to meet the following objectives:

- Increase the recovery of valuable resources from residual waste
- Divert waste from landfill, supporting the NSW Government targets for landfill diversion, responsible waste management and reducing the burden of landfills on the environment and communities
- Develop waste management infrastructure close to waste generation sources, reducing waste transport distances and associated environmental impacts
- Develop and operate a facility to international best-practice standards that protects the health of people and the environment in the surrounding area

[2] Directive 2010/75/EU of the European Parliament https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32010L0075
[3] https://eippcb.jrc.ec.europa.eu/sites/default/files/2020-01/JRC118637_WI_Bref_2019_published_0.pdf

- Develop a facility which integrates the built form into the existing context, including adopting architecture which minimises visual bulk, and provides opportunities to enhance the appearance of the building
- Build trust with the community through ongoing engagement in the planning, design, construction and operation of the EfW facility
- Set up an education resource that raises awareness of the principles of waste management, waste avoidance, the circular economy, recycling, resource recovery and EfW
- Contribute to the economy in Western Sydney by creating direct and indirect skilled employment opportunities, both during construction and long-term
- Provide a source of baseload energy, part of which is categorised as renewable, contributing to NSW Government objectives for energy security and renewable energy.

1.3 Site description

The proposal site is located at 339 Wallgrove Road in Eastern Creek, NSW (Lot 1 DP 1059698) which is in the Blacktown local government area (LGA) and the Wallgrove Precinct of the Western Sydney Parklands (WSP) Plan of Management. **Figure 1.1** shows the location of the site relative to Sydney.

The nearest residential area is around 1km to the south of the site in Horsley Park with the Minchinbury residential area located around 3km to the north-west. Horsley Park Public School is over 2km south of the site and a childcare centre is within the Eastern Creek industrial area about 1km to the west of the site.

The site is bounded by the Westlink M7 Motorway to the west with the Eastern Creek industrial area located farther west. The SUEZ Eastern Creek Waste Management Centre, comprising the now-closed landfill site and operational organics recycling facility is located to the north and north-east, with the operational Global Renewables waste management facility located immediately to the east (see **Figure 1.3**). To the south, the site is bounded by the Warragamba Pipeline Corridor with the Austral Bricks facility located farther south. **Figure 1.2** shows the local site context.

Access to the site is via a dedicated access road off an unnamed road, referred to as the Austral Bricks Road, adjacent to the site’s southern boundary. The road crosses over the Warragamba Pipeline Corridor to enter the site from the south. The existing access road was built by encasing the two pipelines during construction of the M7. The site access needs to be upgraded to accommodate the traffic movements associated with the proposal, however site access works do not form part of this EIS and are discussed in **Chapter 22 Related development**. Austral Bricks Road connects to Wallgrove Road which in turn connects to the wider road network including the M7 motorway.

The 8.23ha site is divided by a small strip of land not part of the proposal site, resulting in a 2.04ha northern section and a 6.19ha southern section (**Figure 1.3**). This dividing strip is part of the adjacent lot and includes a right of carriageway benefitting the proposal site, allowing vehicles to move between the two parts of the site.

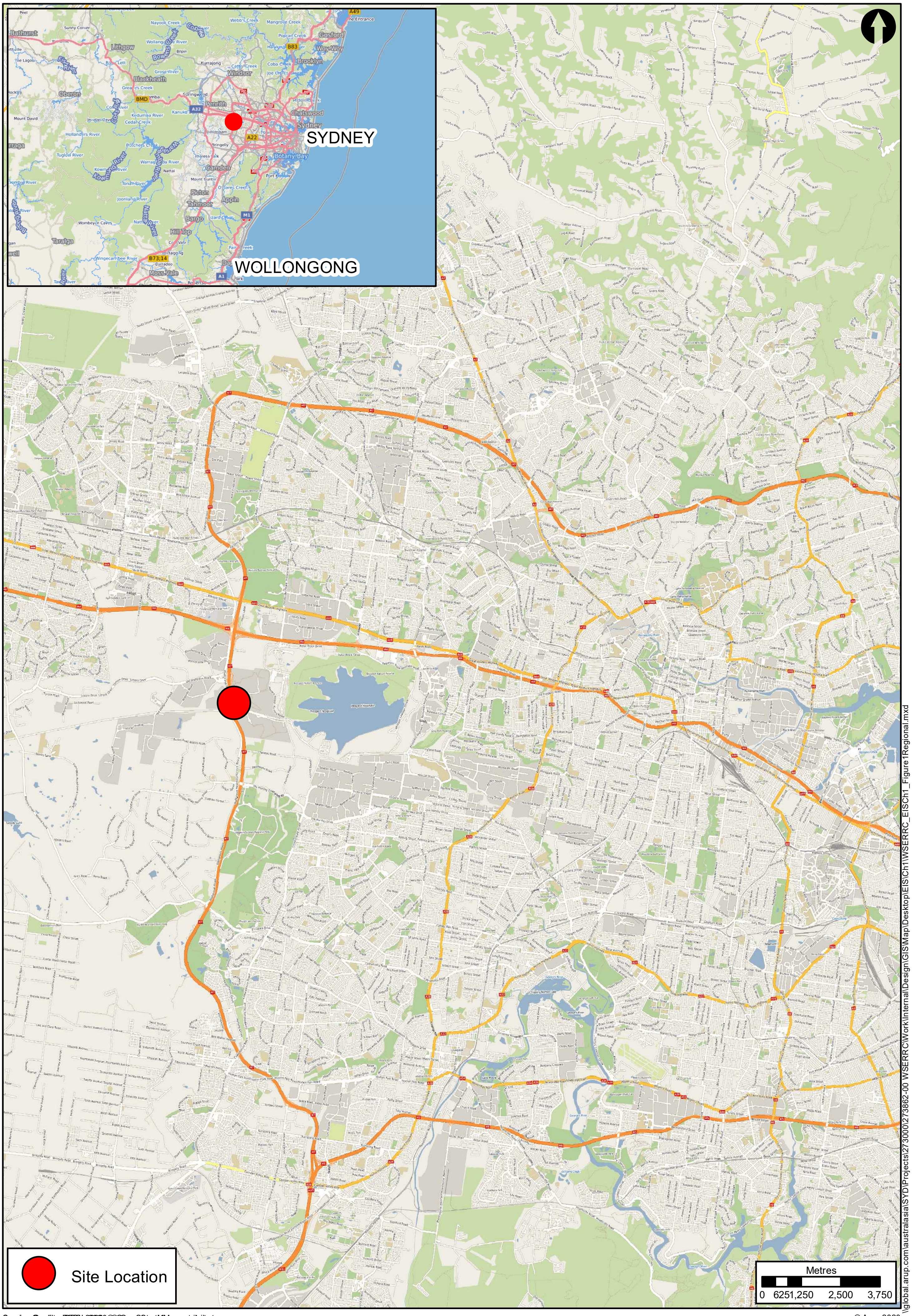
The existing site layout and current features of the site are shown in **Figure 1.4**. The site is sloping from the south-west (highest point) to the north-eastern area of the site where the man-made farm dam is situated. A stormwater overland flow path enters the site via twin culverts to the south and passes through the site along the eastern boundary to the north. From the farm dam spillway, the densely vegetated overland flow path conveys flows northwards then north-west, eventually discharging into Reedy Creek about 450m north west of the site.
A separate open stormwater drain is within the M7 WestLink Motorway property boundary, which collects and conveys stormwater from the section of the M7 WestLink Motorway adjacent to the proposal site. This drain has been designed such that stormwater does not discharge to the proposal site. Small areas of hard standing adjacent to the western boundary, comprising about 5% of the site, are graded to the west, conveying overland flows into the open drain serving the M7 Westlink Motorway. This open drain flows north and discharges into Reedy Creek.

There is minimal piped stormwater drainage within the site, with building downpipes discharging to the adjacent surface.

The proposal site supports about 0.88ha of native vegetation comprising one Plant Community Type (PCT) with varying levels of disturbance and condition. Native vegetation within the proposal site generally comprises isolated patches of regrowth Cumberland Shale Plains Woodland (PCT 849) within low-lying areas along the eastern property boundary. Vegetation within the site is subject to high levels of disturbance due to historical land clearing, agricultural land uses and ongoing industrial and transport activities.

The existing southern portion of the site includes sheds and ancillary buildings associated with a disused poultry facility and storage of wrecked vehicles, all of which will be cleared from the site before the commencement of construction.

Currently, two hectares of the northern part of the site are paved. The proposal area will be fully contained in the 6.19ha portion of the site as shown in **Figure 1.3.** Works to occur on the 2.04ha northern section of the site include the clearing of weeds and exotic vegetation within the existing overland flow channel, which is confined to the eastern section of this parcel of land. The northern section will also be used temporarily to support construction works. It is not currently expected that any other works will occur on the 2.04ha northern section of the site as part of this proposal.



Service Credits: DFSI, 2020, © OpenStreetMap contributors

© Arup 2020

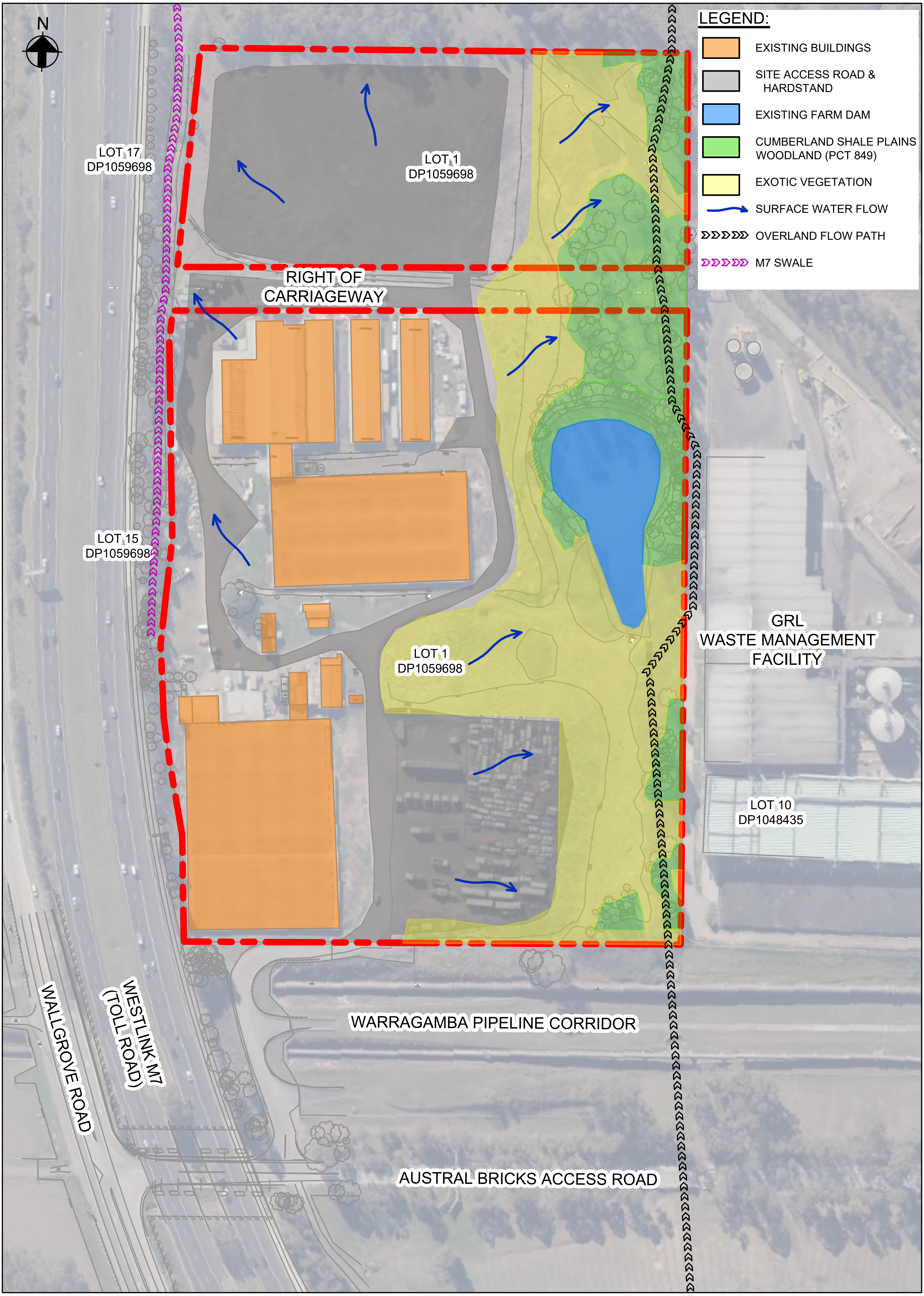
Figure 1.1: Site location

Service Credits: DFSI, 2020, © OpenStreetMap contributors
© Arup 2020

Figure 1.2: Local context

Service Credits: DFSI, 2020

Figure 1.3: Proposal site boundary



Service Credits: DFSI, 2020

Figure 1.4: Existing site boundary

1.4 About the applicant

The applicant is Cleanaway Operations Pty Ltd, on behalf of a joint venture between Cleanaway and Macquarie Capital who are developing the proposal. The land is owned by the Western Sydney Energy & Resource Recovery Centre Pty Ltd (ACN 635 427 262), an entity jointly owned by Cleanaway and Macquarie Capital, with details as described in **Table 1.1**.

Table 1.1: Entity and site details

Full name	Cleanaway Operations Pty Ltd
Postal address	Level 4, 441 St Kilda Road, Melbourne Metro Victoria (South East), VIC 3004
Australian business number	40 010 745 383
[redacted]	[redacted]
[redacted]	[redacted]
Site owner(s)	Western Sydney Energy & Resource Recovery Centre Pty Ltd ACN 635 427 262
Legal description of site	Lot 1 DP 1059698

1.4.1 Cleanaway Operations

Cleanaway is an Australian waste management, recycling and industrial services company. Its stated mission is to make a sustainable future possible by viewing all waste as a resource and using its facilities and processes to transform it into a valuable commodity for every sector, industry and community. It is an ASX Top 100 company.

As Australia's largest waste, recycling, industrial and liquids service provider, Cleanaway has been servicing Australian businesses for over 50 years through a network of recycling facilities, transfer stations, engineered landfills, liquid treatment plants, medical waste treatment facilities and refineries.

Cleanaway has more than 250 sites across Australia, 5,000 vehicles and 120 licensed prized infrastructure assets. Cleanaway's Solid Waste Services business operates the largest solid waste and recycling fleet in Australia, servicing more than 95 municipal councils and over 140,000 commercial and industrial businesses.

Cleanaway believes that environmental performance is crucial to the success and sustainability of their business and is committed to achieving a high level of environmental performance at all its facilities.

To achieve this, Cleanaway conducts its business in compliance with an independently certified ISO 14001 Environmental Management System, which is underpinned by their Environmental Policy. Cleanaway also holds several Environmental Protection Licences (EPL) in New South Wales.

The solid waste collection business is supported by an extensive post-collection facilities network across the country, including the Erskine Park Waste Transfer Station in Western Sydney, which is licensed to accept 300,000t of putrescible waste each year.

In 2018, Cleanaway recycled more than 380,000t of paper and cardboard, 15,500t of plastic, and 25,000t of steel and aluminium. Cleanaway captured more than 115Mm^3 of landfill gas and generated over 135GWh of renewable energy, enough to power more than 27,000 homes.

Cleanaway's Footprint 2025 strategy is focussed on investing in world class recycling and resource recovery infrastructure to improve landfill diversion and recycling rates. Cleanaway's investments in innovation and infrastructure reflects the Federal and State Government's domestic circular economy policies.

WSERRC forms an element of the Footprint 2025 strategy, for residual waste that cannot otherwise be recycled. Cleanaway continues to invest in higher-order recycling and resource recovery facilities across Australia to maximise the environmental benefit of the waste being generated. More recent projects in New South Wales are detailed below.

In 2017, Cleanaway (as part of a joint venture with Tomra) was appointed as the network operator for the NSW Container Deposit Scheme (CDS). Collected containers are processed through a state-of-the-art Materials Recovery Facility in Western Sydney with over four billion containers recycled since the inception of the scheme, putting New South Wales well on track to reaching its goal of a 40% state-wide reduction in the proportion of drink containers in the total litter volume by 2020.

Another joint venture, the Cleanaway ResourceCo Resource Recovery Facility in Wetherill Park, is the largest waste-to-processed engineered fuel (PEF) facility of its kind in Australia, recovering dry non-recyclable C&I waste that would otherwise go to landfill. By using PEF instead of coal to power industry, the reliance on fossil fuels is reduced, lowering greenhouse gas emissions, while diverting up to 250,000t of waste from landfill each year.

Cleanaway has entered into a memorandum of understanding with Pact Group and Asahi Beverages to jointly develop a local plastic pelletising facility, onshoring the recycling of plastics to Australia. The facility will be based in Albury Wodonga to service the East Coast of Australia.

It is anticipated that the facility will process up to 28,000t of plastic bottles and other recyclables into flake (plastic fragments) and food grade pellets to be used as a raw material to produce packaging for food and beverages.

The recycling of the used bottles reduces the demand for new plastic and hence the reliance on fossil fuel required to manufacture it, thereby helping to reduce NSW's carbon footprint. The cross-value chain collaboration combines the expertise of each participant. Cleanaway will provide available feedstock through its collection and sorting network in Victoria and New South Wales. Pact will provide technical and packaging expertise and Asahi and Pact will buy most of the recycled pellets from the facility to use in their packaging products. This reflects Cleanaway's commitment to invest in infrastructure that will allow the shift to a circular economy.

The proposed WSERRC would further strengthen Cleanaway's waste management infrastructure in Sydney, complementing its existing business by providing a means of treating residual waste streams that cannot otherwise be recycled, generating renewable baseload energy and reducing the volume of waste going to landfill.

1.4.2 Macquarie Capital

Cleanaway will develop the WSERRC jointly with Macquarie Capital. Macquarie Capital is the developer and co-investor in Australia's first thermal energy from waste project, Avertas Energy, currently under construction at Kwinana in Perth, Western Australia.

Macquarie Capital combines specialist expertise, innovative advice, and flexible capital solutions to help clients and partners make opportunity reality. This ranges from global corporate M&A and advisory capabilities, underpinned by deep specialist expertise across a range of sectors, and a full spectrum of capital solutions – to investing its own capital to enable development and construction of infrastructure and energy projects.

Macquarie's Green Investment Group (GIG) is part of Macquarie Capital and brings a depth and breadth of global expertise in green technology and development to Macquarie Capital's leading position in Australia and New Zealand as an equity investor and developer of green energy and infrastructure assets. Together, Macquarie Capital and GIG have been involved in either developing, financing or investing in more than 35 biomass and EfW projects globally, including the Dublin EfW facility, which is a reference facility for this proposal.

Through a global team of over 450 staff, Macquarie Capital and GIG offer clients international reach, a deep pool of expertise, global procurement and access to a growing pipeline of high value investment opportunities – to ultimately – accelerate the green transition.

1.5 Delivery of the WSERRC

Design of the proposal will continue to progress following lodgement of the EIS, responding to submissions received through the exhibition of the EIS and, if approved, conditions of consent.

A suitable operator with experience in managing an EfW facility and complying with relevant environmental regulations will be appointed to partner with Cleanaway to operate the proposal.

The selected operator will need to demonstrate that they are eligible to hold an EPL, having regard to the requirements of the *Protection of* the *Environment Operations Act 1997* (POEO Act). The operator will also be required to operate the proposal in accordance with Cleanaway's Environmental Policy and independently certified ISO 14001 Environmental Management System, reflecting Cleanaway's commitment to achieving a high level of environmental performance at its facilities.

1.6 Assessment process

This EIS has been prepared under the Secretary's Environmental Assessment Requirements (SEARs) for the proposal issued by the Department of Planning, Industry and Environment (DPIE) on 12 December 2019. A list of the SEARs and where they have been addressed in this EIS is included in **Appendix A Secretary's Environmental Assessment Requirements cross-reference table**.

The proposal is State significant development (SSD) as it is classified as electricity generating works with a capital investment value (CIV) of more than $30m under Schedule 1 of the State Environmental Planning Policy (State and Regional Development) 2011 (SRD SEPP). The estimated CIV is around $645m as referenced within **Appendix D Statement of CIV**.

The SSD status of the proposal is further reinforced by the proposal site being located within the Western Sydney Parklands (WSP), being development that has a CIV of more than $10m on land identified as being within the Western Parklands on the WSP Map within the meaning of State Environmental Planning Policy (Western Sydney Parklands) 2009.

Figure 1.5 shows the phases in the SSD process, and indicates the current status of the application, namely Exhibition of EIS.

The EIS follows on from the Scoping phase where a Scoping Report was prepared to identify the potential impacts of the proposal on the environment to help DPIE and agencies in preparing SEARs for the proposal which are covered in **Appendix A**.

1 Early Consultation and Scoping

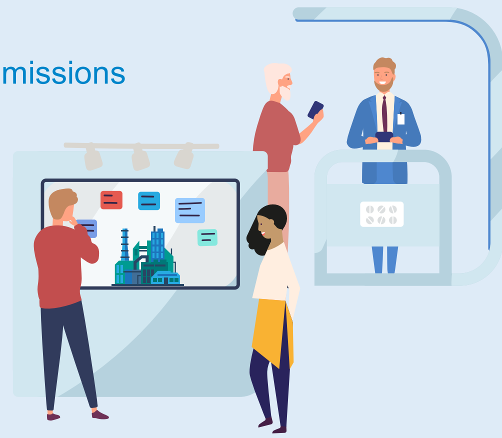
- Identify issues of importance to the community and stakeholders to be addressed in the EIS
- Identify how the community want to be engaged during the EIS process
- Leading to the submission of a Scoping Report to support a request for Secretary's Environmental Assessment Requirements to confirm the scope of the EIS

2 Prepare EIS

- Assessment of environmental impacts and feedback to the proposal layout and design
- Ongoing engagement with the community and stakeholders
- Preparation of EIS to address SEARs including assessment of environmental impacts and outcomes of community and stakeholder engagement

3 Exhibit EIS and Respond to Submissions

- **DPIE exhibits the EIS for a minimum of 28 days and invites submissions**
- Applicant assesses and responds to submissions



4 Assessment and Determination

- Assessment of application by DPIE, including preparation of Assessment Report
- Determination of application by consent authority, including any conditions if consent is granted
- Applicant addresses requirements of conditions of consent
- Ongoing engagement with the community and stakeholders during construction and operation

Figure 1.5: State significant development process

1.7 Document purpose and structure

The purpose of this document is to describe the proposal for which approval is being sought, assess impacts that are predicted to occur during the proposal's construction, operation, and maintenance, and identify measures to avoid, manage and mitigate those impacts. The EIS allows the public to understand the proposal and its potential impacts and helps the decision-makers to inform the assessment and determination process.

The assessment documents are structured to generally follow section 3.2 of Preparing an Environmental Impact Statement: Draft Environmental Impact Assessment Guidance Series June 2017 (DPIE, 2017) and to meet the requirements of Schedule 2 of the *Environmental Planning and* Assessment *Regulations 2000*. Clauses 6 and 7 of the Schedule set the form and content of an EIS. **Table 4.1** of **Chapter 4 Statutory context** describes where the form and content requirements set out in clauses 6 and 7 are addressed in this EIS.

- Volume 1 (this document) is the main statement document, describing the proposal, its strategic and statutory context, the approach to community engagement and a summary of specialist environmental studies. Site layout and design drawings are included as appendices to Volume 1 along with other appendices.
- Volume 2 contains specialist studies.

Volume 1 contains 26 chapters and 6 Appendices:

- Chapter 1 Introduction
- Chapter 2 Strategic context
- Chapter 3 Proposal description
- Chapter 4 Statutory context
- Chapter 5 EfW policy
- Chapter 6 Engagement
- Chapter 7 Environmental assessment scope
- Chapters 8–21 Key issues: environmental assessment
- Chapter 22 Related development
- Chapter 23 Cumulative impacts
- Chapter 24 Summary of management and mitigation measures
- Chapter 25 Evaluation and conclusions
- Chapter 26 References

- Appendix A Secretary's Environmental Assessment Requirements cross-reference table
- Appendix B Architecture and Landscape Design Strategy Report
- Appendix C Drawings
- Appendix D Statement of CIV
- Appendix E Landowner's consent
- Appendix F Community and Stakeholder Engagement Report.
- Appendix G Information relating to the Draft Voluntary Planning Agreement (VPA)

Chapter 2

Strategic context

2 Strategic context

This chapter assesses how the proposal supports the objectives of relevant Government policies, strategies and plans, demonstrating the need for the proposal. It gives a strategic justification for EfW by describing its role in achieving Government objectives for waste and energy when considered as part of an integrated waste management strategy. It also describes the alternative sites considered for the proposed development, reviews the suitability of the preferred site and outlines the alternative layouts and designs considered within the site.

This chapter includes:

- An introduction to EfW
- A discussion on how the proposal supports relevant government policies, strategies and plans for waste, energy and land use
- An analysis of alternatives to EfW, alternative EfW technologies, alternative sites and alternative layouts and designs considered for the proposal, and that supported the selection of the preferred option
- Analysis of the site's suitability for the proposed use.

Chapter 4 Statutory context describes the legislation that this proposal must comply with to demonstrate the assessment pathway, permissibility and merits of the proposal.

2.1 Introduction to Energy from Waste

EfW refers to the process of converting waste materials into energy.

The Waste Management and Resource Recovery Association Australia (WMRR)[1] explains EfW as follows:

'Energy from Waste (EfW), also known as Waste to Energy (WtE), refers to a process of converting residual wastes into energy such as heat, electricity, or liquid transport fuels. The term EfW is broad, encompassing a range of thermal and biological processes. These include mature technologies, including combustion for heat and power, anaerobic digestion to generate biogas, and emerging technologies that allow waste to be converted to other energy products, such as gas or liquid fuels. EfW can form a vital part of a sustainable waste management chain, is fully complementary to recycling, and is already part of the global move towards implementing circular economy principles in waste management.'

[1] July 2019

For the purpose of this proposal, EfW refers to the recovery of energy through the thermal treatment of residual waste streams collected from a fully source-separated collection system or leftover after recycling and resource recovery. Source separation involves separating waste into common material streams or categories for separate collection. The EfW process significantly reduces the volume of waste being sent to landfill while generating baseload energy, part of which is categorised as renewable. Both the NSW Energy from Waste Policy Statement (NSW EfW policy) and the *Protection of the Environment Operations Act 1997* give a definition of thermal treatment as 'the processing of waste by burning, incineration, thermal oxidation, gasification, pyrolysis, plasma or other thermal treatment processes.'

In 2015, the NSW EPA published the NSW EfW policy which recognises that energy recovery is a valid pathway for managing residual waste in circumstances where higher-order material recovery is not possible. It reflects the environmental and human health protection objectives of the *Protection of the Environment Operations Act 1997* and the resource management objectives of the *Waste Avoidance and Resource Recovery Act 2001.* Note that the NSW EfW policy describes facilities that thermally treat non-eligible waste fuels as 'energy recovery facilities.' This term is interchangeable with 'energy from waste facilities' in the context of the WSERRC proposal.

While some residual materials are produced as a result of the EfW process, including incinerator bottom ash (IBA), boiler fly ash and flue gas treatment residues (FGTr) (which are further defined in **Chapter 3 Proposal description**), the EfW process typically leads to about 90% reduction in the volume (or 80% reduction in mass (tonnes)) of waste that would otherwise go to landfill. If IBA is reused for construction products, this number increases further to about 95% reduction in volume and mass of waste that would otherwise go to landfill. However, diversion from landfill will be dependent on the classification and fate of the wastes generated by the EfW facility.

2.2 EfW in the waste hierarchy

Figure 2.1 shows the waste hierarchy, a recognized waste management principle that guides the decision-making in Australia and internationally for the efficient use of resources. In New South Wales, the waste hierarchy underpins and is included in the objectives of the *Waste Avoidance and Resource Recovery Act 2001* (WARR Act).

The waste hierarchy sets up an order of preference for how waste should be managed to help achieve the best possible environmental outcomes.
Waste avoidance is the best option, followed by resource recovery (including reuse, recycling and energy recovery) followed by treatment and disposal.

Waste should be managed at the highest practical level of the waste hierarchy to achieve the best outcome for the environment and for future generations. Economic, social and technological factors all play a role in determining the best practical outcome for specific waste streams.

On the waste hierarchy, energy recovery of residual waste is preferable to landfill because it recovers some value from the waste, reduces net GHG emissions, requires less land and diminishes the legacy impacts of landfills such as soil and water contamination from leachate as well as odour impacts. While operation of the facility will generate GHG emissions, consideration of factors including export of electricity back to the grid and the diversion of the equivalent waste which would otherwise be sent to landfill, results in the overall net reduction of GHG emissions by around 390,000t CO_2-e per year.

The NSW Government has a target of achieving 75% diversion from landfill by 2021 (WARR Strategy). The current diversion from landfill is 65%[2]. EfW as part of an integrated waste management strategy will help increase diversion from landfill.

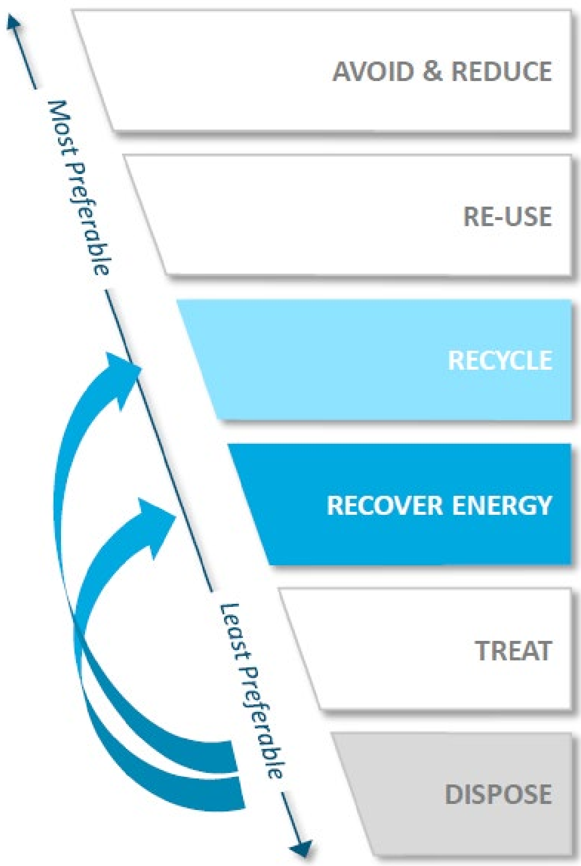


Figure 2.1: Waste hierarchy

[2] NSW EPA, *Waste Avoidance and Resource Recovery Strategy Progress Report 2017–18* (Sydney, 2019).

2.3 Global EfW context

Although EfW using thermal treatment is an emerging concept in Australia, it is a proven and widely used approach to treat residual waste globally with many operational examples located in highly populated urban areas.

In 2016, there were 488 EfW plants operating in Europe, thermally treating 93.3Mt of waste[3]. In the United States of America, 80 EfW facilities were operating in 2014 and processing 30Mt of waste annually.[4]

Internationally, the main drivers for developing EfW facilities include:

- The environmental benefits of EfW compared to landfill, such as:
    - Requiring a smaller land footprint, thus making better use of valuable land resources
    - Avoiding risks of soil, groundwater and surface water contamination through leachate migration
    - Avoiding landfill gas emissions which continue long after the landfill has closed
    - Decreasing general amenity impacts such as odour, vermin and pest issues
    - Promoting the proximity principle by treating waste close to the source of waste generation, reducing transport impacts
- Declining landfill space and availability due to a lack of suitable sites and social and environmental concerns limiting new landfills
- Legislative instruments such as landfill bans, mandatory waste diversion targets and the prohibition of waste transport for disposal
- Increasing price of waste disposal through increasing landfill tax levies associated with policy changes
- Synergies that EfW can offer with heat-demanding industrial facilities and urban heating systems, which offer attractive co-location opportunities
- Increasing price of fossil fuels and alternative production sources allowing EfW to be commercially competitive, coupled with increasing energy demand due to population growth as well as increasing waste generation
- EfW performing a useful urban function by reducing the volume of waste to be disposed and/or provision of affordable heating
- Incentive mechanisms designed to encourage low carbon and renewable energy generation which includes EfW
- Community expectations that valuable resources are used efficiently, and the environmental impacts of waste management are minimised.

[3] Confederation of European Waste-to-Energy Plants, 2019.
[4] USA Energy Recovery Council, 2014.

Moving grate is a common form of EfW combustion technology and is a recognised and proven EfW technology that has been used globally for over 50 years. In that time, the technology has been subject to continual improvement responding to regulatory, industry and public demands. Over 95% of facilities that thermally treat MSW and C&I waste to produce electricity worldwide use moving grate technology.

2.4 Australian EfW context

2.4.1 Approved EfW facilities

Although EfW is an emerging technology in Australia, there are other similar EfW facilities approved or already under construction in Australia. These include:

- Australia's first large-scale EfW facility located in Kwinana, Western Australia. Macquarie Capital is its co-developer, owner and asset manager. This facility is currently under construction and is expected to be completed in late 2021. This facility will process 400,000tpa of residual waste from MSW and C&I sources using moving grate technology to generate 36MW of baseload energy, part of which is renewable.
- The East Rockingham Resource Recovery Facility, which has recently started construction. This facility is expected to process around 300,000tpa of residual waste from MSW and C&I sources and up to 30,000tpa of biosolids from the Perth metropolitan area. The facility will use moving grate technology to generate 29MW of baseload energy, part of which is renewable.
- The Australian Paper EfW facility in Victoria, which achieved its key approvals in 2019. If the facility is developed, it will be capable of producing steam for the operation of the paper mill, and electricity for the mill or for export to the grid. It will thermally treat about 650,000tpa of residual MSW and C&I waste using moving grate technology to produce 225MW of thermal energy (steam and electricity).
- There are several other facilities that use residual waste as a feedstock including cement kilns.

2.4.2 NSW context

In New South Wales, demand for EfW is determined by the following:

- Resource recovery targets such as the WARR Strategy target to increase the amount of waste diverted from landfill to 75% by 2021, are unlikely to be achieved without EfW.

To achieve this target, more than 1.2Mt[5] of materials will need to be recycled when continued correcting for waste generation and population growth rates. The EPA recognises in the EfW Policy Statement that EfW can be a valid pathway for residual waste where further material recovery through reuse, reprocessing or recycling is not financially or technically feasible. In addition, overall waste generation is expected to increase as Sydney's population grows to around 10 million by 2036[6].

Despite waste generation per capita being expected to decrease (see **Technical report E Waste Flow Analysis for Greater Sydney**), population growth will result in more waste, which will need to be managed.

- Declining landfill space at existing landfills and social and environmental concerns limiting the development of new landfills
- Landfill levies and gate fees support the development of waste infrastructure including EfW facilities.
- Community expectations for a higher-order use for waste management than landfill.

Landfill airspace in the Sydney region is diminishing, with limited land suitable for expansion or new landfill developments. Sydney currently relies on two putrescible landfills to meet its waste disposal needs for MSW – Lucas Heights and Woodlawn. From 2033, it is expected to reduce to one facility – Veolia's Woodlawn Facility which is 220km from the proposal site – following the expected closure of the SUEZ facility at Lucas Heights (see **Technical report E Waste Flow Analysis for Greater Sydney**). EfW, as part of an integrated waste management strategy, will offer a solution to manage Sydney's residual waste stream that cannot otherwise be recycled in the current market, while generating energy in the process.

EfW can be used to recover useful energy and resources from Sydney's residual waste while reducing the volume of waste disposed to landfill, consistent with the waste hierarchy (**Figure 2.1**) and easing pressure on scarce landfill capacity.

2.5 Strategic policy

This section describes how the proposal supports the strategic outcomes identified in relevant Government waste, energy and land use policies, strategies and plans.

---

[5] WARR Strategy, 2014.
[6] http://www.planning.nsw.gov.au/Research-and-Demography/Demography/Population-Projections

The policies, strategies and plans relevant to setting the strategic context and justification of the WSERRC proposal include:

Waste:

- National Waste Policy – Less Waste, More Resources 2018
- NSW Waste Avoidance and Resource Recovery (WARR) Act 2001 (WARR Act)
- NSW Waste Avoidance and Resource Recovery Strategy 2014–2021 (WARR Strategy)
- Western Sydney Regional Waste Avoidance and Resource Recovery Strategy 2017–2021
- NSW EPA Energy from Waste Policy Statement (NSW EfW policy). The EfW policy describes detailed technical requirements for an EfW facility. These are discussed in **Chapter 5 EfW policy.**
- NSW Circular Economy Policy Statement 2019.

Energy:

- Commonwealth Renewable Energy Target Scheme
- NSW Renewable Energy Action Plan
- NSW Climate Change Policy Framework
- NSW Electricity Strategy.

Land use:

- Greater Sydney Region Plan – A Metropolis of Three Cities
- Central City District Plan (Greater Sydney Commission, 2018), part of the Greater Sydney Region Plan
- State Environmental Planning Policy (Western Sydney Parklands) 2009 (WSP SEPP, NSW Government, 2009)
- Western Sydney Parklands (WSP) Plan of Management 2030 (Western Sydney Parklands Trust, 2018).

Further discussion of SEPPs as they relate to the proposal is contained in **Chapter 4 Statutory context**.

It is noted that the Blacktown Local Environmental Plan 2015 (LEP) does not apply to land within the WSP. However, relevant requirements of the LEP are considered in various technical assessment reports throughout the EIS. **Table 2.1**, **Table 2.2** and **Table 2.3** analyse how the WSERRC supports the relevant objectives of waste, energy and land use policies, strategies and plans listed above.

Table 2.1: Evaluation of strategic waste policies, strategies and plans relevant to this proposal

<table>
<tr><th colspan="2">Waste policies, strategies and plans</th></tr>
<tr><th>Relevant provisions</th><th>WSERRC proposal</th></tr>
<tr><td colspan="2">NSW Waste Avoidance and Resource Recovery (WARR) Act 2001 (WARR Act)</td></tr>
<tr><td colspan="2">The WARR Act promotes waste avoidance and resource recovery to achieve a continual reduction in waste generation and allows for the development of a state-wide Waste Strategy.</td></tr>
<tr><td>The WARR Act's key objectives relevant to the proposal include:
(a) to encourage the most efficient use of resources and to reduce environmental harm in line with the principles of ecologically sustainable development,
(b) to ensure that resource management options are considered against a hierarchy of the following order—
(i) avoidance of unnecessary resource consumption,
(ii) resource recovery (including reuse, reprocessing, recycling and energy recovery),
(iii) disposal,
(c) to allow for the continual reduction in waste generation,
(d) to minimise the consumption of natural resources and the final disposal of waste by encouraging the avoidance of waste and the reuse and recycling of waste,
(e) to ensure that industry shares with the community the responsibility for reducing and dealing with waste,
(f) to ensure the efficient funding of waste and resource management planning, programs and service delivery,
(g) to achieve integrated waste and resource management planning, programs and service delivery on a State-wide basis,
(h) to help in the achievement of the objectives of the Protection of the Environment Operations Act 1997.</td><td>The principles of ecologically sustainable development and how this proposal addresses each of the principles is described in Chapter 25 Evaluation and conclusions.
The WSERRC proposal is not an alternative to recycling. Rather, it is part of an integrated waste management strategy for New South Wales, complementary to the other steps in the waste hierarchy and contributing to the WARR targets. Before arriving at the EfW facility, waste will be either pre-processed to recover valuable materials to be recycled and reused or collected from source segregated collections. On the waste hierarchy, energy recovery of residual waste is preferable to landfill because it recovers some value from the waste, needs less land, reduces net GHG emissions, lessens the legacy impacts of landfills such as soil and water contamination from leachate as well as reducing odour impacts.
Materials will be recovered through the EfW process onsite including metals, which will be sold to metal recyclers, and IBA. IBA will be transferred off site to a separate facility (to be developed) where further metals recovery is currently intended to take place. Options for the reuse of IBA in construction products replacing virgin materials are being investigated, which would allow these materials to be returned to productive use.
In addition, the renewable component of the energy generated by the proposal will displace carbon emissions from fossil fuel sources.
The proposal will involve building a visitor and education centre to help educate and inform the community on the principles of waste management, waste avoidance, the circular economy, recycling, resource recovery and EfW.</td></tr>
<tr><td colspan="2">NSW Waste Avoidance and Resource Recovery Strategy 2014–2021 (WARR Strategy)</td></tr>
<tr><td colspan="2">The Waste Avoidance and Resource Recovery Strategy 2014–2021 is the state-wide Waste Strategy for the purposes of the Act, which also includes a requirement for biennial progress reporting by the EPA.
The NSW WARR Strategy sets clear directions for a range of priority areas over the seven-year Strategy period with the primary goal of enabling the NSW community to improve environment and community well-being by reducing the environmental impact of waste and using resources more efficiently. The key areas covered in the strategy will support investment in much-needed infrastructure, encourage innovation and improve recycling behaviour. They will also help develop new markets for recycled materials and reduce litter and illegal dumping. The Strategy notes that reuse and recycling will remain the main avenues for diverting waste from landfill as supplemented by energy recovery in the future.
The WARR Strategy also points to the EfW policy (2015), as a vital policy step to maximise resource efficiency noting that the inclusion of resource recovery criteria in the EfW policy ensures that the availability of energy recovery in New South Wales will not undermine current or future material resource recovery.
The NSW EPA is currently in the process of preparing a new 20 Year Waste Strategy, to set the future direction of the State's waste and resource recovery system, which will replace the current Strategy document. The new strategy may introduce different targets or priority actions for the state. However, the core principle of the waste hierarchy is enshrined in the overarching legislation and will continue to guide NSW EPA in its approach to resource management and landfill diversion.
The new 20 Year Waste Strategy will replace the WARR Strategy 2014–2021. An Issues Paper, Cleaning Up Our Act: The Future for Waste and Resource Recovery in N
SW was released for consultation in March 2020 and seeks feedback on various options for reform which are relevant and largely complementary to the WSERRC proposal. Three main points outlined in the Issues Paper that may be of relevance to the proposal include:
1. New South Wales can't absorb the waste it is currently exporting and with the closure of export markets, there is a need for increased onshore waste and recycling infrastructure and markets.
2. Mandatory source separation of organics
3. Review and improve the EfW policy to uphold the waste hierarchy. Possibly introduce restrictions on waste acceptance to landfill which are at least as restrictive as acceptance criteria on EfW.
The 20 Year Waste Strategy is still under development, noting that this policy is not legislated and so not currently relevant to this proposal.</td></tr>
</table>

<table>
<tr><th colspan="2">Waste policies, strategies and plans</th></tr>
<tr><th>Relevant provisions</th><th>WSERRC proposal</th></tr>
<tr><td>The NSW WARR Strategy's key result areas relevant to this proposal include:
• Theme 2: Increase recycling, with a target to increase recycling of municipal solid waste, and commercial and industrial waste, to 70%.
• Theme 3: Divert more waste from landfill, with a target to increase the amount of waste diverted from landfill to 75%.</td><td>The WSERRC proposal is not an alternative to recycling. Rather, it is part of an integrated waste management strategy for New South Wales, complementary to the other steps in the waste hierarchy and contributing to the WARR targets. The WARR targets being to increase recycling of MSW, and C&I waste, to 70% and to increase the amount of waste diverted from landfill to 75%. Although New South Wales has set itself these landfill diversion and recycling targets by 2021–2022, actual recycling rates in the Metropolitan Levy Area (MLA) for MSW are currently short of this target. MSW recycling rates declined in the MLA from 52% in 2010–2011 to 42% in 2017–2018[7], highlighting the need for investment in responsible waste infrastructure that is proven and effective. The decline in recycling rates should also be understood in the context of an overall increase in waste generation associated with population growth, placing further pressure on declining landfill capacity.

Further, to achieve the NSW recycling target, NSW needs greater source separation of recycling streams including food and garden organics (FOGO), plastic, paper and glass to allow clean streams of material with reduced contamination. Without source separation, the contamination makes it ineffective and costly to separate out waste streams for recycling. Dirty Mixed Recycling facilities (MRFs) and the revocation of Mixed Waste Organic Outputs (MWOO) cases are examples of this. The general and specific Resource Recovery Orders and Resource Recovery Exemptions for the application of MWOO to land was revoked by the EPA in October 2018 due to the contamination of the output product. It is expected that this change will have an adverse effect on the MSW recycling rate[8].

Government initiatives in New South Wales to encourage recycling include Waste Less Recycle More (WLRM) grants to help with investment in infrastructure for C&I recycling and increase more effective kerbside recycling such as targeting FOGO as well as developing markets to encourage innovation. However, despite government efforts to increase recycling, the rate of recycling is still low. Experience from European countries with the highest rates of recycling indicates that they are achieving recycling rates up to 66% of their waste, with the remaining recovery being from EfW[9]. Achieving higher landfill diversion rates involves thermal treatment of the residual waste that cannot otherwise be recycled within existing technical and financial constraints. This may change in the future as circular economy principles influence the design of materials and products, allowing these materials to be reused and recycled, reducing the amount of waste generated. However, options to manage residual waste will continue to be needed, including EfW.

Currently, the Metropolitan Levy Area (MLA) which comprises of the Sydney metropolitan area, the Illawarra region and Hunter region, sends about 3.27Mt of MSW and C&I waste to landfill each year, as shown in the table below. This represents roughly 55% of the total MSW and C&I waste generated in the MLA and offers an opportunity for this waste to be used for higher-order energy and resource recovery.

Table 2.1-1: Volumes of MSW and C&I waste in the Metropolitan Levy Area[10]
<table><tr><th>Waste</th><th>Generated tonnes</th><th>Recovered tonnes</th><th>Disposed tonnes</th></tr><tr><td>MSW</td><td>2,959,000</td><td>1,218,000 (41.1%)</td><td>1,741,000 (58.9%)</td></tr><tr><td>C&I</td><td>3,007,000</td><td>1,469,000 (48.9%)</td><td>1,538,000 (51.1%)</td></tr><tr><td>Total</td><td>5,966,000</td><td>2,687,000 (45%)</td><td>3,279,000 (55%)</td></tr></table>
This proposal will mainly target residual MSW and C&I waste in the Western Sydney market, although the proposal may also accept waste from other regions in Sydney. The proposal will process 500,000t of residual MSW and C&I waste each year, which is about 15% of the MSW and C&I waste from the MLA that is currently disposed of to landfill[11].

Cleanaway has many existing contracts with Councils and businesses in Sydney for the collection and disposal of MSW and C&I waste and will continue to compete for new contracts as Councils and businesses renew their waste service providers. MSW collected by Cleanaway is taken to a disposal location as prescribed by Council – collection and disposal contracts are generally separated. Cleanaway will continue to compete for Council waste disposal contracts, offering the option to thermally treat residual waste at the WSERRC after pre-treatment at a processing facility as detailed under the NSW EfW policy resource recovery criteria. The WSERRC can also directly accept residual waste from Councils that transition to a collection system that includes a FOGO bin as well as C&I waste that meets source separation criteria as defined within the EfW policy. Cleanaway currently serves a significant proportion of the C&I waste market in Sydney. C&I waste is sent to Cleanaway's network of post-collection recycling and resource recovery facilities which recycle and recover materials for resale, with residual waste leftover currently sent to landfill.

In addition to energy recovery, the WSERRC proposal will include a ferrous metal separator to recover large ferrous metals from the IBA for recycling and sale to market. The remaining IBA will be transported to a dedicated ash storage, treatment, metal recovery and maturation facility where non-ferrous metals (or secondary metals) recovery will be carried out. The ash storage and secondary metals recovery facility does not form part of this proposal and will be subject to a separate development application process which is discussed further in Chapter 22 Related development. Building on knowledge and practice elsewhere, the applicant will work collaboratively with industry partners to investigate the feasibility of developing a market for reuse of IBA in construction products.</td></tr>
</table>

[7] NSW EPA, *Waste Avoidance and Resource Recovery Strategy Progress Report 2017–18* (Sydney, 2019).
[8] WARR, *Strategy Progress Report 2017–18*
[9] OECD, *Australian National Waste Report* (2018).
[10] NSW EPA, *Waste Progress Report 2017–18.*
[11] EPA, *Waste Progress Report 2017–18*

<table>
<tr><th colspan="2">Waste policies, strategies and plans</th></tr>
<tr><th>Relevant provisions</th><th>WSERRC proposal</th></tr>
<tr><td></td><td>Cleanaway also work to educate the community and businesses through its in-house sustainability team including the EPA Bin Trim program and the kNOw waste school's education program which are complimentary educational initiatives not part of this proposal. Cleanaway will encourage uptake of source separation for high-quality resource recovery and expects the prevalence of source separation, particularly FOGO collection services for households, to increase over time. WSERRC and Cleanaway will actively support the transition to FOGO with Councils including through the education of the community which is critical to a successful transition and achieving low contamination rates. Cleanaway has also recently invested in a 100,000tpa FOGO processing facility in Melbourne, demonstrating the company's ability to treat this waste stream, a capability it could bring to Sydney to support the FOGO transition.</td></tr>
<tr><td colspan="2">Western Sydney Regional Waste Avoidance and Resource Recovery Strategy 2017–2021</td></tr>
<tr><td colspan="2">The Western Sydney Regional Waste and Resource Recovery Strategy 2017–2021 (Regional Waste Strategy) gives a clear direction for improving sustainable waste avoidance and resource recovery practices across the region and demonstrates the region's commitment to adopting a strategic approach to waste management. The regional strategy is a subset of the overall WARR strategy and describes how the region will contribute to and align with the State objectives and targets developed through the WARR Strategy.

For Western Sydney, the aim has been to analyse future waste generation in the region and combine alternative treatment and energy recovery facilities to treat residual waste to meet the WARR Strategy targets.
The Western Sydney region brings together the members of WSROC, including Blacktown City Council (BCC). This proposal sits within the LGA of Blacktown.</td></tr>
<tr><td>The Regional Waste Strategy's key outcomes relevant to this proposal include:
• Contribute to the achievement of the NSW 2021 WARR targets through regional collaboration
• Support councils where services can be improved
• Identify and promote best practice community engagement to raise awareness of waste avoidance and resource recovery
• Work collaboratively to develop innovative waste management and resource recovery initiatives that maximise regional benefits.</td><td>As described above, the proposal will contribute to the State WARR Strategy targets for landfill diversion and recycling which will also support the achievements of regional waste strategy objectives.

The WSERRC will offer an alternative waste management option which is a higher-order use for waste management than landfill. This can be specified in its waste disposal contracts.

Community and stakeholder engagement for the proposal started early and continued regularly. Engagement activities aimed to raise awareness about EfW and its widespread use in reputable waste management systems overseas, as well as discuss the beneficial impacts of EfW diverting waste from landfill and recovering valuable resources including metals and ash. Future community engagement will occur through a community reference group (CRG) through the detailed design and construction phases and during operation through an onsite visitor and education centre, where visitors can learn about waste avoidance, best practice recycling and the circular economy.

Building on knowledge and practice elsewhere, the applicant will work collaboratively with industry partners to investigate the feasibility of developing a market for reuse of IBA in construction products. Developing an EfW facility is innovative given that it is introducing a technology which is recognized overseas but new to New South Wales.</td></tr>
<tr><td colspan="2">NSW Energy from Waste Policy Statement 2015</td></tr>
<tr><td colspan="2">The NSW EfW Policy Statement sets up a framework and overarching criteria to guide proposals for thermal energy from waste infrastructure in New South Wales. It covers all technologies undertaking thermal treatment of waste to recover energy and recognises that the recovery of energy and resources from the thermal processing of waste has the potential, as part of an integrated waste management strategy, to bring beneficial outcomes for the community and environment. The Policy sets requirements that EfW projects must meet, including best available techniques for emissions control and waste management as well as technical, thermal efficiency and resource recovery criteria. Chapter 5 EfW policy describes how the proposal meets the relevant objectives and criteria of the EfW Policy Statement.</td></tr>
<tr><td colspan="2">National Waste Policy – Less Waste, More Resources 2018</td></tr>
<tr><td colspan="2">The 2018 National Waste Policy sets a framework for collective action by businesses, governments, communities and individuals until 2030 and sets a framework for businesses to embrace innovation and develop technologies that create new opportunities.
The policy identifies five overarching principles underpinning waste management in a circular economy:
1. Avoid waste
2. Improve resource recovery
3. Increase use of recycled material and build demand and markets for recycled products
4. Better manage material flows to benefit human health, the environment and the economy
5. Improve information to support innovation, guide investment and enable informed consumer decisions.
The Policy does not remove the need for governments, businesses and industries to apply tailored solutions in response to local and regional circumstances. The Policy presents a common vision on priorities for responding to changing international waste markets that will help Australia move closer to a more circular economy that eliminates waste and improves economic, social and environmental outcomes.</td></tr>
<tr><td>The Policy aims to better support the economy, protect community health and reduce environmental impacts by harnessing the value of materials that would otherwise be disposed of by returning them to productive use.</td><td>The proposal will support the Policy by generating up to 55MW of energy to be exported to the grid, equivalent to, 440GWh of baseload energy per year, part of which is categorised as renewable, by using residual waste that would otherwise be disposed to landfill. This is enough electricity to power up to 79,000 homes for one year. The proposal will also recover metals from the combustion process onsite for sale to metal recyclers. Options for the offsite recovery and reuse of ash from the combustion process are also being investigated, building on experience in other jurisdictions where ash is used in construction materials.

This proposal will reduce net GHG emissions by around 390,000t of CO_2-e per year by reducing landfill emissions such as methane (which continue well after the landfill has closed) and contributing to a partly renewable energy source which displaces fossil fuel energy and its associated emissions.</td></tr>
</table>

Waste policies, strategies and plans	
Relevant provisions	**WSERRC proposal**
Strategy 7: Increasing industry capacity Identify and address opportunities across municipal solid waste, commercial and industrial waste, and construction and demolition waste streams for improved collection, recycling and energy recovery, to achieve ongoing improvements in diversion from landfill, improved quality of recycled content and use of the waste hierarchy.	The proposal will be designed to thermally treat up to 500,000tpa of residual Municipal Solid Waste (MSW) and residual Commercial and Industrial (C&I) waste streams that would otherwise be sent to landfill. This process would generate up to 58MW of base load electricity some of which would be used to power the facility itself with up to 55MW exported to the grid. A proportion of the electricity generated would be categorised as renewable. The WSERRC is being developed by industry to address opportunities for waste in New South Wales to be managed in line with the waste hierarchy. On the waste hierarchy, energy recovery of residual waste is preferable to landfill because it recovers some value from Sydney's residual waste while reducing the volume of waste disposed to landfill and easing pressure on scarce landfill capacity.
NSW Circular Economy Policy Statement 2019	
The NSW Circular Economy Policy Statement 2019 sets the ambition and approach for the NSW Government to transition to a circular economy that will generate jobs, increase the robustness of the economy, increase the accessibility of goods, maximise the value of resources, and reduce waste. The policy covers common language and definitions, and decision-making principles to support Government. The aim of this policy is for New South Wales to transition towards a circular economy by focusing on seven key principles as outlined below.	
Principle 1: Sustainable management of all resources	The proposal will significantly reduce the volume of waste going to landfill by recovering energy from residual waste, reducing pressure on the limited landfill air-space resource in Sydney and the need to identify new disposal sites. Diversion of waste from landfill will also reduce the amount of landfill gas generated, including methane, which is a significant contributor to climate change. Metals will be recovered from the IBA through an onsite process, with the recovered metals sold to metal recyclers. IBA will be transported off site where further metals recovery will be carried out. Options for recycling of IBA will be investigated including recycling in construction products, returning these materials to productive use. The renewable component of the energy generated by the proposal will displace carbon emissions from fossil fuel sources. Options are also being investigated for the use of heat and steam by nearby industrial facilities. This will significantly increase the energy efficiency of the proposal.
Principle 2: Valuing resource productivity	The energy contained in residual waste is a valuable resource which can be put to a productive use, and metals and ash can be recovered from the residual waste for recycling. The proposal enables these resources to be captured rather than going to landfill, for sale to end-users. EfW also has a smaller footprint than landfills and so is a better use of valuable land resources.
Principle 3: Design out waste and pollution	The proposal will significantly reduce the volume of waste going to landfill by recovering energy from residual waste. Diversion of waste from landfill will also reduce the amount of landfill gas generated, including methane, which is a significant contributor to climate change. The EfW facility has been designed to remove harmful gases and heavy metals from the exhaust gas before the cleaned air is released through the stack. The proposal's intention over the long term is to develop markets in New South Wales to beneficially reuse IBA within construction products, subject to IBA being granted a resource recovery exemption by the EPA under the *Protection of the Environment Operations (Waste) Regulation 2014*. The EPA would be consulted with regarding any such IBA exemption. The Dublin (Ireland) reference facility included in this EIS uses IBA (post removal of other recoverable materials such as metals) as a construction material. There are many examples across Europe of similar ash reuse schemes.
Principle 4: Maintain the value of products and materials	EfW recovers energy for homes and businesses as well as powering the facility itself. The proposal will also recover materials such as metals which can be recycled and ash that has the potential to be used in construction products. As circular economy principles influence the design of materials and products in the future, these materials can be reused and recycled, reducing the amount of waste generated. The proposal will process 500,000t of residual MSW and C&I waste each year, which is about 15% of the MSW and C&I waste from the MLA that is currently disposed of to landfill[12]. Since the proposal is only aiming to process 15% of current residual waste generation rates, it means that if residual rates decrease due to increased recycling then the facility is not undermining the advancement of higher-order waste principles. The proposal has the flexibility to accommodate improvements in resource recovery and changes in feedstock over time.
Principle 5: Innovate new solutions for resource efficiency	IBA, which is a residual waste from the EfW process is composed of inert, non-combustible materials which makes it viable to be used in construction products. Although not yet well-known practice in Australia, IBA is currently used in Europe in a variety of construction products including aggregates, roads and landfill capping material. The Dublin (Ireland) reference facility included in this EIS uses IBA (post removal of other recoverable materials such as metals) as a construction material. There are many examples across Europe of similar ash reuse schemes. Building on knowledge and practice elsewhere, the applicant will work with industry partners to investigate the feasibility of developing a market for reuse of IBA in construction products.
Principle 6: Create new circular economy jobs	The proposal will support this principle as it represents a major investment in Western Sydney of about $645m. It is estimated that the proposal will create 900 direct construction jobs over the 3-year construction period and in addition between 700-1200 indirect construction jobs. Further, 50 highly skilled jobs will be created locally during operation. In particular, the proposal will need and create new skill sets and employment opportunities in Western Sydney not otherwise currently available in the region.
Principle 7: Foster behaviour change through education and engagement	The proposal will include building a visitor and education centre to help educate and inform the community on the principles of the circular economy, recycling, resource recovery and EfW. WSERRC and Cleanaway will actively support additional source separation and promote the transition to FOGO with Western Sydney Council's and Cleanaway's C&I customer base including through the education of the community, which is critical to a successful transition and achieving low contamination rates. Cleanaway has also recently invested in a 100,000tpa FOGO processing facility in Melbourne, demonstrating the company's ability to treat this waste stream, a capability it could bring to Sydney to support the FOGO transition.

[12] EPA, *Waste Progress Report 2017–18*

Table 2.2: Evaluation of strategic energy policies, strategies and plans relevant to this proposal

<table>
<tr><th colspan="2">Energy policies, strategies and plans</th></tr>
<tr><th>Relevant provisions</th><th>WSERRC proposal</th></tr>
<tr><td colspan="2">Commonwealth Renewable Energy Target Scheme</td></tr>
<tr><td colspan="2">The Commonwealth Renewable Energy Target Scheme forms part of the Commonwealth Renewable Energy (Electricity) Act 2000.
The Scheme is designed to reduce emissions of greenhouse gases in the electricity sector and encourage the additional generation of electricity from sustainable and renewable sources. The scheme has two parts, small-scale energy generation and large-scale power stations. Under the Commonwealth Renewable Energy (Electricity) Regulations 2001, eligible renewable energy sources include biomass-based components of municipal solid waste. On this basis, the proposal is eligible for participation in the large-scale power station scheme. The Large-scale Renewable Energy Target (LRET) incentivises the development of renewable energy power stations in Australia through a market for the creation and sale of certificates called large-scale generation certificates (LGCs). Based on quarterly waste audits done at Cleanaway's Erskine Park Waste Transfer Station (to understand expected feedstock composition, energy and carbon content), it is expected that the proposal will be eligible for LGCs equivalent to roughly 50% of the electricity produced.</td></tr>
<tr><td>(a) to encourage the additional generation of electricity from renewable sources; and
(b) to reduce emissions of greenhouse gases in the electricity sector; and
(c) to ensure that renewable energy sources are ecologically sustainable.</td><td>The proposal would form an eligible generation category under this Scheme. The large-scale renewable energy target of 33,000GWh means that about 23.5% of Australia's electricity generation in 2020 needs to be from renewable sources. While it is close to the end date of the scheme, it is likely that renewable energy generation targets will extend beyond 2020.
The proposal would generate up to 58MW of base load electricity some of which would be used to power the facility itself with up to 55MW exported to the grid, equivalent to 440GWh of baseload energy per year, part of which is categorised as renewable. This is enough electricity to power 79,000 homes for one year.</td></tr>
<tr><td colspan="2">NSW Renewable Energy Action Plan</td></tr>
<tr><td colspan="2">The NSW Renewable Energy Action Plan responds to the national renewable energy target set in 2013. The plan identifies opportunities for renewable energy in New South Wales and identifies actions that aim to attract renewable energy, build community support for renewable energy and grow expertise in renewable energy technology.</td></tr>
<tr><td>Support the National target of 20% renewable energy generation by 2020.</td><td>The proposal will support the generation of up to 55MW of energy on a net basis to be exported to the grid, equivalent to 440GWh of baseload energy per year. This would be equivalent to the production of enough electricity to power 79,000 homes for one year. The renewable portion of energy generated by the proposal is assumed to be 50% (about 220GWh), which is equivalent to around 0.66% of Australia's current Renewable Energy Target of 33,000GWh.</td></tr>
<tr><td colspan="2">NSW Climate Change Policy Framework</td></tr>
<tr><td colspan="2">The NSW Climate Change Policy Framework commits NSW to supporting the achievement of Commonwealth interim greenhouse gas emissions reduction targets of 5% below 2000 levels by 2020 and 26% to 28% below 2005 levels by 2030.</td></tr>
<tr><td>The Framework sets an aspirational emission reduction objective for New South Wales of net zero emissions by 2050.</td><td>Regarding GHG emission reductions, the proposal would contribute to the production of a partly renewable energy source in a safe, reliable and affordable manner. The proposal will produce the equivalent amount of energy to power 79,000 homes in Western Sydney, reducing net GHG emissions by around 390,000t CO_2-e per year, also equivalent to taking about 85,000 cars off the road each year.</td></tr>
<tr><td colspan="2">NSW Electricity Strategy</td></tr>
<tr><td colspan="2">The NSW Electricity Strategy is the NSW Government's plan for a reliable, affordable and sustainable electricity future.
The plan responds to current challenges and opportunities in New South Wales, including energy efficiency, reliability, electricity emergencies and renewable energy.</td></tr>
<tr><td>Promote private sector investment in energy generation
Promoting utility scale renewable energy sources</td><td>The proposal will support the generation of up to 55MW of energy on a net basis to be exported to the grid, equivalent to 440GWh of baseload energy per year, part of which is categorised as renewable. This would be equivalent to the production of enough electricity to power 79,000 homes in Western Sydney for one year. The renewable portion of energy generated by the proposal would be equivalent to 0.5% of Australia's current Renewable Energy Target of 33,000GWh.
The proposal represents a significant private sector investment in baseload energy generation in New South Wales, part of which is categorised as renewable, creating jobs during construction and operation. This is consistent with the Strategy, which notes the NSW Government's preference is for the market to generate the investment necessary to ensure reliable and affordable electricity.
The Strategy also references the Australian Energy Market Operators (AEMO) Integrated Systems Plan (ISP) which demonstrates that retiring coal plants can be most economically replaced with a portfolio of utility-scale renewable generation, storage, distributed energy resources, flexible thermal capacity, and transmission (AEMO, ISP, 2018).
As a utility-scale baseload energy project, part of which is categorised as renewable, brought by the private sector, WSERRC contributes to the objectives of the NSW Electricity Strategy.</td></tr>
</table>

Table 2.3: Evaluation of strategic land use policies, strategies and plans relevant to this proposal

<table>
<tr><th colspan="2">Land use policies, strategies and plans</th></tr>
<tr><th>Relevant provisions</th><th>WSERRC proposal</th></tr>
<tr><td colspan="2">Greater Sydney Region Plan – A Metropolis of Three Cities</td></tr>
<tr><td colspan="2">The Greater Sydney Region Plan sets a 40-year vision (to 2056) and forms a 20-year plan underpinning each of three City District Plans. The proposal is in the Central City District. The plan brings new thinking to land use and transport patterns to boost Greater Sydney's liveability, productivity and sustainability by spreading the benefits of growth. As the district plans are the means to apply the Region Plan, the relevant objectives of the Greater Sydney Region Plan are covered in the discussion on the Central City District Plan below.</td></tr>
<tr><td colspan="2">Central City District Plan (Greater Sydney Commission, 2018), part of the Greater Sydney Region Plan.</td></tr>
<tr><td colspan="2">The Central City District Plan is a 20-year plan to manage growth in the context of economic, social and environmental matters for the local government areas of Blacktown, Cumberland, Parramatta and The Hills. The site is in the Central City, one of three City Districts that make up the Greater Sydney Region. The District Plan sets out a vision for the Central City, which will be applied through several objectives. The key objectives of the Plan relevant to this proposal include the following:</td></tr>
<tr><td>Planning Priority C1: Planning for a city supported by infrastructure</td><td>The proposal will create infrastructure that is significant to the effective working of a city – infrastructure to manage the waste of a growing population and generate a source of baseload energy. In a context of limited space for waste management infrastructure, the proposal is using a site that is located in an area with other reputable waste management infrastructure. This proposal's location within Western Sydney also means that waste management infrastructure is close to the point of waste generation sources, reducing the economic and environmental costs of waste transportation in line with the proximity principle.</td></tr>
<tr><td>Planning Priority C2: Working through collaboration</td><td>The development of the WSERRC proposal has been informed by a comprehensive approach to community and stakeholder engagement. The community was engaged before and during the EIS process and will continue to be engaged during EIS exhibition. If the Proposal is approved, the community will continue to be engaged throughout construction, operations and for the life of the project with the visitor and education centre playing a crucial role in offering information on the role of EfW in managing waste as part of an integrated waste management strategy.

Community research has been conducted to understand their issues, ideas, and sentiment and to recognise their preferences for how they wanted to be engaged on the proposal. The findings from this research have been applied throughout the community engagement strategy. Further information on community collaboration can be found in Chapter 6 Engagement.

A collaborative approach has also underpinned efforts by Cleanaway and Macquarie Capital to identify a solution for the reuse of IBA. While not part of this proposal, Cleanaway and Macquarie Capital are working with industry partners to investigate the feasibility of developing a market for reuse of IBA in construction products. IBA is composed of inert, non-combustible materials which makes it viable to be used in construction products. Although not yet common practice in Australia, IBA is currently used in Europe in a variety of construction products including aggregates, roads and landfill capping material. The Dublin (Ireland) reference facility included in this EIS uses IBA (after removal of other recoverable materials such as metals) as a construction material. There are many examples across Europe of similar ash reuse schemes.</td></tr>
<tr><td>Planning Priority C11: Maximising opportunities to attract advanced manufacturing and innovation in industrial and urban services land</td><td>While not a manufacturing facility, the proposal to develop an EfW facility is innovative given that it is introducing a technology which is recognized overseas but new to New South Wales. Cleanaway and Macquarie Capital are also investigating options to reuse IBA in construction products, as described above.</td></tr>
<tr><td>Planning Priority C13: Protecting and improving the health and enjoyment of the District's waterways</td><td>The site design includes realignment of the overland flow path along the eastern boundary of the site and clearing and revegetation with native species. This will contribute to better biodiversity and water quality outcomes in the overland flow path which connects to Reedy Creek to the north.</td></tr>
<tr><td>Planning Priority C15: Protecting and enhancing bushland, biodiversity and scenic and cultural landscapes</td><td>Species within the threatened Cumberland Shale Plains Woodland vegetation class are native to the proposal site. However, the existing site is degraded and dominated by exotic grass and weeds, with small patches of regrowth in poor to very poor condition. The planting design for the proposal aims to restore this native vegetation by use of tree, shrub, grass and riparian species. A vegetation management plan (VMP) for the proposal has been prepared to guide the revegetation works and restoration of the overland flow path on site.
Existing mature native trees will be retained where possible and safe to do so, particularly along the overland flow path.</td></tr>
<tr><td>Planning Priority C16: Increasing urban tree canopy cover and delivering Green Grid connections</td><td rowspan="5">The District Plan recognises the significant role of the WSP in contributing to another objective – linking parks, bushland, playground and waterways through the Greater Sydney Green Grid. The location of the proposal on the western perimeter of the WSP, adjacent to the M7 and existing industrial facilities and on land of low environmental or recreational value, will avoid the areas of the WSP that are used for recreation, supporting the aims of the District Plan to integrate the Green Grid with the WSP. However, the overall landscaping plans for the proposal site will see the replacement of poor-quality vegetation with new native planting, expanding the urban tree canopy and restoration of Cumberland Plains Woodland species. The detailed design of the proposal will include a landscaping plan which may contribute to the further integration of the Green Grid with the WSP, subject to consultation with the WSPT. Native planting within the site offers biodiversity links to surrounding vegetation corridors. The landscape design responds to operational and aesthetic amenity through:
• Water capture and treatment, ephemeral planting and embankment stabilisation within the bioretention basin, onsite detention basin and an overland flow path.
• Green walls to the north and south end of the main facility, and green roof to the visitor and education centre to help with grounding the built form into the landscape
• Revegetation of Cumberland Shale Plains Woodland species and overland flow path
• Use of native hardy species to maintain an attractive and low maintenance landscape.</td></tr>
<tr><td>Objective 30 Urban tree canopy cover is increased.</td></tr>
<tr><td>Objective 32 The Green Grid links parks, open spaces, bushland, and walking and cycling paths.</td></tr>
<tr><td>Action 68. Expand urban tree canopy in the public realm</td></tr>
<tr><td>Action 69. Progressively refine the detailed design and delivery of:
(a) Greater Sydney Green Grid priority corridors and projects vital to the District
(b) opportunities for connections that form the long-term vision of the network.</td></tr>
</table>

Land use policies, strategies and plans	
Relevant provisions	**WSERRC proposal**
(c) walking and cycling links for transport as well as leisure and recreational trips. Action 70 Create Greater Sydney Green Grid connections to the Western Sydney Parklands	Direct bike and walking path linkages to other areas of the WSP have not been included, due to the industrial nature of operational activities that will occur on the site. The main walking and cycling routes through the WSP are located east of the site with the M7 cycle track located adjacent to the western perimeter of the site. However, the design includes a visitor and education centre as an educational resource which will attract groups to the facility which may increase overall visitation to the WSP. The landscape design offers an attractive site for visitor experience, from the entrance and along the eastern area to the visitor and education centre. Adequate cycle parking and end of trip facilities will be arranged within the office component of the site. This will support employees wishing to travel to the site via bicycle, who can use the M7 shared path to access the site safely. Information will also be issued as part of the Green Travel Plan to improve awareness of the surrounding cycling routes. The site layout will have a paved path connecting from the entrance to the visitor and education centre, so pedestrians and cyclists can access the proposal site safely. A community reference group (CRG) will be formed for the proposal, responsible for administering a community funding package. The funding package would be designed to invest in infrastructure for Western Sydney and give back to those residents closest to the facility. The areas for investment would include environmental projects to offer solutions for urban heating (tree planting), improving sporting infrastructure (for example, upgrades to lighting at sport facilities) and community recreation.
Planning Priority C19: Reducing carbon emissions and managing energy, water and waste efficiently	The Australian energy landscape is transitioning away from fossil fuel based large scale power stations towards a diverse portfolio including utility-scale renewable generation, storage, distributed energy resources and flexible thermal capacity. EfW has a role to play in this shift by contributing to the energy mix, offering base-load generation and supporting renewable energy targets while diverting residual waste from landfill and reducing greenhouse gas emissions compared to the same baseload energy from coal-fired power plants. The diversion of waste from landfill will also contribute to reducing landfill related GHG emissions. The main source of water demand is for the EfW process and measures have been incorporated into the design to reuse process water as much as possible. Water consumption has been optimised such that water is wholly consumed by the EfW process with water lost to a combination of steam or quenching of the IBA. So, no remaining process water is discharged to sewer. Rainwater harvesting will also occur from main building roof runoff for reuse in the EfW plant process to reduce reliance on potable water.
Objective 33 A low-carbon city contributes to net-zero emissions by 2050 and mitigates climate change. Potential pathways towards net-zero emissions in the District include: • Precinct-scale renewable energy generation • Waste diversion from landfill.	Climate change is a significant risk and a major challenge for industry across the globe. The IPCC's review of the waste sector[13] determined that fugitive emissions from landfill waste make landfills the fourth largest contributor to climate change after electricity generation, transport and manufacturing. Methane gas is a greenhouse gas which is considered more potent than carbon dioxide at absorbing the sun heat, having 25 times the effect of carbon dioxide[14]. It is then critical to reduce not only waste disposal to landfills and associated fugitive methane generation, but to reduce reliance on non-renewable energy sources to move towards a net zero carbon future. There are opportunities for addressing methane emissions by reducing the amount of waste that ends up in landfill, an opportunity which the WSERRC facility will allow. The renewability of waste to energy and its climate change mitigation potential presents an opportunity to support the transition to a low carbon economy. The proposal will contribute to these objectives by creating a utility scale energy source leading to reduced net GHG emissions of up to 390,000t CO_2-e each year compared to coal-fired power, equivalent to taking about 85,000 cars off the road each year. The proposal will capture energy from residual waste materials to support the generation of up to 55MW of energy on a net basis to be exported to the grid, equivalent to 440GWh of baseload energy per year, part of which is categorised as renewable. This would be equivalent to the production of enough electricity to power 79,000 homes in Western Sydney for one year. The diversion of waste from landfill will result in the reduction of methane gases produced during the decomposition process of landfilled waste. Based on the alternate disposal of the equivalent amount (500,000tpa) of waste to landfill, resultant reduction of GHG emissions from landfill diversion are around 401,000t CO_2-e per year.
Objective 34 Energy and water flows are captured, used and reused.	The WSERRC will capture energy from residual waste materials equivalent of up 58MW of base load electricity some of which would be used to power the facility itself with up to 55MW exported to the grid. Energy flows are captured through the recovery of energy from waste. The main objective regarding water use is to reuse as much water as possible during operation of the facility. No process wastewater will be treated outside of the facility during normal operation. The site stormwater strategy covers the retention of water onsite and its controlled release to overland flow paths. Rainwater is captured in rainwater storage tanks for reuse within the site.
Objective 35 More waste is reused and recycled to support the development of a circular economy.	Transitioning to a circular economy for waste aims to make sure that products are designed to eliminate waste and pollution, and that products and materials keep circulating in the economy at their highest value for as long as possible. This is done through reuse, repair, re-manufacturing, recycling, and similar activities. When products and materials can no longer be circulated and become waste, the energy embodied in the waste can be harnessed, metals recovered and recycled, and the ash produced recycled, before finally disposing of the residues in landfill. As circular economy principles influence the design of materials and products in the future, these materials can be reused and recycled, reducing the amount of waste generated. However, options to manage residual waste will continue to be necessary in New South Wales, including EfW. The European Commission published guidance on the role of EfW in the circular economy (26.1.2017 COM (2017) 34). The main aim of this guidance document was to ensure that recovery of energy from waste in the EU supported the objectives of the circular economy action plan and was guided by the waste hierarchy.

[13] IPCC, *Protocol for predicting national methane emission inventories from landfills* (2018).
[14] https://theglobalclimate.net/methane-gas/

Land use policies, strategies and plans	
Relevant provisions	**WSERRC proposal**
	For member states with low or non-existent EfW capacity and ongoing reliance on landfill, it indicates that new EfW infrastructure could be an appropriate element of the long-term resource management system in line with the waste hierarchy and circular economy objectives. The WSERRC proposal is consistent with this guidance because the facility sizing and proposed feedstock strategy accommodates increased source separation, particularly of organics, over the long term. Similarly, the NSW EfW Policy recognises that energy recovery is a valid pathway for managing residual waste in circumstances where higher-order material recovery through reuse, reprocessing or recycling is not financially sustainable or technically achievable and community acceptance can be secured. The proposal will also recover metals from the combustion process onsite. Options for the offsite recovery and reuse of IBA from the combustion process are also being investigated, building on knowledge and practice elsewhere, and working collaboratively with industry partners to investigate the feasibility of developing a market for reuse of IBA in construction products. Recycling pathways, including organic recovery from mixed waste and export of recyclable materials, have become unavailable or unacceptable. The ambition to significantly increase domestic recycling and use of waste materials reflects a growing sense of responsibility for ensuring an environmentally sound fate for Australia's waste. EfW can offer an onshore pathway to manage residual waste and result in a higher-order outcome for waste which would otherwise have been landfilled. The WSERRC facility has flexibility to accommodate changes in feedstock as domestic recycling capacity and markets for recycled material are developed. WSERRC and Cleanaway will actively support and promote the transition to FOGO with Councils including through the education of the community which is critical to a successful transition and achieving low contamination rates. Cleanaway has also recently invested in a 100,000tpa FOGO processing facility in Melbourne, demonstrating the company's ability to treat this waste stream, a capability it could bring to Sydney to support the FOGO transition.
Action 75. Support initiatives that contribute to the aspirational objective of achieving NetZero emissions by 2050, especially through the establishment of low-carbon precincts in Growth Areas, Planned Precincts, Collaboration Areas, State Significant Precincts and Urban Transformation projects.	The proposal will contribute to these objectives by creating a baseload energy source, part of which is categorised as renewable leading to: • Reduced net GHG emissions of up to 390,000t CO_2-e each year • Capturing energy from residual waste materials equivalent to up to 55MW of baseload energy on a net basis • Emphasising the importance of only receiving residual material from higher-order reuse and recycling facilities. The proposal would divert up to 500,000t of residual waste. The Australian energy landscape is transitioning away from fossil fuel based large scale power stations towards a diverse portfolio including utility-scale renewable generation, storage, distributed energy resources and flexible thermal capacity. EfW has a vital role to play in this shift by contributing to the energy mix, offering base-load generation, supporting renewable energy targets, diverting residual waste from landfill and reducing greenhouse gas emissions. As noted earlier, the IPCC reviewed the waste sector[15] and determined that fugitive emissions from landfill waste make landfills the fourth largest contributor to climate change after electricity generation, transport and manufacturing. Methane gas is a greenhouse gas which is considered more potent than carbon dioxide at absorbing the sun's heat, having 25 times the effect of carbon dioxide[16]. It is then critical to reduce not only waste disposal to landfills and associated fugitive methane generation, but to reduce reliance on non-renewable energy sources to move towards a net zero carbon future. There are opportunities for addressing methane emissions by reducing the amount of waste that ends up in landfill, an opportunity which the WSERRC facility will allow. The renewability of waste to energy and its climate change mitigation potential presents an opportunity to support the transition to a low carbon economy.
Action 76. Support precinct-based initiatives to increase renewable energy generation and energy and water efficiency, especially in Growth Areas, Planned Precincts, Collaboration Areas, State Significant Precincts and Urban Transformation projects.	This proposal will be a source of baseload energy generation, part of which is categorised as renewable, located in the Wallgrove Precinct of the WSP. It has also included initiatives to enable the efficient use of water including reuse of process water on site, capturing rainwater for reuse on site, detention to manage the controlled release of stormwater and investigation of the feasibility of supply part of the site water demand through the Sydney Water recycled water network. Options to supply heat/steam to nearby industrial facilities are being investigated.
Action 77. Protect existing and recognize new locations for waste recycling and management	The proposal is located in the WSP Wallgrove Precinct at a site previously used for industrial purposes in a recognized area for waste and recycling infrastructure. Nearby waste facilities include the now-closed Eastern Creek landfill site and the operational Global Renewables (GRL) waste management facility. The site is also located adjacent to a well-known road network such as the M7 motorway which is central for waste facilities in ensuring waste can be easily transported to the waste facility. The site is also preferable due to it being well separated from residential and other receptor locations. The closest residential areas are around 1km to the south of the site with Erskine Park residential area located around 3.5km to the west and Minchinbury located around 3km to the north. As landfill capacity in the Sydney region declines and with new landfill sites difficult to find, the proposal offers an alternative option to landfill disposal, located in an area historically associated with waste management. The proposal creates a vital waste management service in the Sydney region on a site with low environmental or recreational value.

[15] IPCC, *Protocol for predicting national methane emission inventories from landfills* (2018)
[16] https://theglobalclimate.net/methane-gas/

Land use policies, strategies and plans	
Relevant provisions	**WSERRC proposal**
Action 78. Support innovative solutions to reduce the volume of waste and reduce waste transport requirements.	The EfW process typically leads to about 90% reduction in the volume (or 80% reduction in mass (tonnes)) of waste that would otherwise go to landfill. In the case that IBA is reused into construction products, this number increases further to about 95% reduction in volume and mass of waste that would otherwise go to landfill. However, diversion from landfill will be dependent on the classification and fate of the wastes generated by the EfW facility. This proposal will divert up to 500,000t of residual waste. The sites location is favourable due to the industrial nature of the surrounding land uses creating the potential for synergies with surrounding industry. For instance, the site is located next to similar waste facilities such as the operational GRL waste management facility located immediately to the east with the Erskine Park Waste Transfer Station located further to the west. The sites location next to transport infrastructure such as the M7 Motorway and Wallgrove Road allows for convenient road transport access routes. Furthermore, the sites location in Western Sydney also means that it is close to waste generation sources reducing the economic and environmental costs of waste transportation to landfill sites further away from the source of waste generation.
Western Sydney Parkland Plan of Management 2030 – Precinct 6: Wallgrove	
The Western Sydney Parklands Trust (WSPT) developed the Plan of Management 2030 to create the strategic framework for the Parklands and assists the WSPT in determining its priorities and actions over the coming years. The NSW Minister for the Environment and Heritage adopted the Plan of Management in December 2018. The Plan of Management divides the WSP into sixteen precincts and includes a high-level Precinct Plan for each. The proposed site is in the Wallgrove Precinct (Precinct 6). The land use framework described in the Plan of Management identifies several land use opportunities for the WSP which include: • Services infrastructure, where the WSP has a long-term role in providing land with low environmental or recreational value, to meet the ongoing and expanding needs of the community for services infrastructure such as electricity, gas, telecommunications, water, and sewerage. • Business and employment, where a means of achieving financial sustainability for the WSP is to use land with low environmental or recreational values for long-term business leases. This generates income, additional local jobs and capital investment in the region.	
The desired future character of the Wallgrove Precinct (Precinct 6) is described as: ' *To be an evolving precinct that includes some of the current uses such as environmental monitoring, brickmaking, agriculture and recycling sites. The precinct has potential for the development of renewable energy and recycling opportunities, agriculture, unstructured recreation and sport uses, and a potential WSPT Business Hub development'.*	The proposal will be consistent with the Plan of Management by using land of low environmental or recreational value for services infrastructure and by creating employment. The site has an industrial and agricultural history having previously been used for poultry production. A detailed site contamination investigation (DSI) has been carried out and is documented in **Technical report G**. The investigation concluded that all soil, water and gas concentrations were within the adopted site assessment criteria, except for asbestos impacted soils, asbestos containing materials (ACM) found in near surface soil and lead beneath one of the workshops. A draft Remediation Action Plan (RAP) (**Technical report G2)** has been prepared for the site and will be carried out to make the site suitable, from a contamination risk perspective, for the proposed land use before construction and in line with SEPP 55. The site is located next to the M7 and Wallgrove Road as well as the Warragamba Pipeline and the Austral Bricks road, with other waste infrastructure located immediately to the east, limiting the recreational and amenity value of the site. The desired future character for the Wallgrove Precinct includes retention of some current uses such as recycling sites and future uses such as recycling and renewable energy. The WSERRC incorporates both recycling and renewable energy and would be consistent with the desired future character of the Precinct.
Objectives:	
Work with other State Government agencies to manage the transition from landfill, to other long-term land uses that will meet Western Sydney's needs	A DSI was carried out and is documented in **Technical report G**. The DSI concluded that all soil, water and gas concentrations were within the adopted site assessment criteria, except for asbestos impacted soils, asbestos containing materials (ACM) found in near surface soil and lead beneath one of the workshops. A draft Remediation Action Plan (RAP) (**Technical report G2**) has been prepared for the site and will be carried out to make the site suitable and safe for the intended use of the proposal. In addition, when first acquiring the site, it was found that the proposal site had an Individual Biosecurity Direction (IBD) due to the site having been detected previously for Salmonella Enteritidis (SE) due to past poultry activities. The applicant worked closely with DPI to render the site safe and suitable and has since received a letter from the Department of Industries (DPI) dated 26 May 2020 which stated *'The NSW DPI Chief Veterinary Officer has approved the status of your property to change from a SE Infected Premise to a Resolved Premise, as you have completed decontamination and 2 sets of SE negative clearance sampling'* and as such, the Individual Biosecurity Direction has been revoked on the proposal site. The WSERRC incorporates both recycling and renewable energy and would be consistent with the Precinct's desired future character. The proposal would divert up to 500,000t of residual red bin waste and reduce net GHG emissions of up to 390,000t CO_2-e each year, capturing energy from residual waste materials equivalent to up to 55MW of baseload energy on a net basis, part of which is categorised as renewable. In developing the proposal, Cleanaway and Macquarie have consulted with government agencies to integrate the proposal into the Wallgrove Precinct and to create a facility that contributes to the energy and waste management needs of Western Sydney as well as creating employment opportunities during construction and operation. Notably, the facility has been sized to receive waste volumes that are known to be available in the Western Sydney region.
Work with agencies to restore ecological and visual landscapes	The design has sought to protect existing vegetation and integrate it into the overall site layout and landscaping strategy with the aim of enhancing the visual appearance and biodiversity. The landscaping (restricted to within the site) is to include screening of the perimeter to mitigate views of ancillary infrastructure. Installation of canopy trees to the front and the east of the site will help with some screening of taller buildings from the east. Revegetation works will reconstruct native vegetation communities and restore the ecological functions of overland flow path, with further details discussed in the Vegetation Management Plan.
Investigate options to develop WSPT Business Hubs at sites designated by the Trust	WSPT has applied for development consent for the Light Horse Interchange Business Hub located to the north of the site. The WSERRC site is not identified as a potential Business Hub but would contribute to employment in the Precinct, employing 50 people full time, as well as generate demand for specialist services and products to support operation of the facility. This will open supply opportunities for local business.

Land use policies, strategies and plans	
Relevant provisions	**WSERRC proposal**
Land use opportunities:	
WSPT Business Hubs at sites designated by the Trust	WSPT has applied for development consent for the Light Horse Interchange Business Hub located to the north of the site. The proposal aligns with the direction of supporting Business Hubs by providing energy to support nearby future development in line with WSP businesses and other facilities. WSERRC is already exploring potential heat usage with industrial facilities near the site.
Urban farming and associated facilities	The proposal can support urban farming by providing energy to farming and associated facilities. It is noted that the Horsley precinct located further south is the main precinct in the WSP identified for urban farming. The proposal could support urban farming activities by creating a source of electricity and/or heat to this precinct. WSERRC is already exploring potential heat usage with industrial facilities near the site.
Extraction, recycling and associated uses	The proposal is an energy-from-waste facility. The WSERRC incorporates both recycling and renewable energy and would divert up to 500,000t of residual Municipal Solid Waste (MSW) and residual Commercial and Industrial (C&I) waste streams that would otherwise be sent to landfill. The proposed facility can generate up to 55MW of electricity, part of which is categorised as renewable, for export to the grid.
Walking and cycling tracks	Direct bike and walking path linkages to other areas of the WSP have not been included to this stage of the design, mostly due to safety reasons due to the industrial nature of operational activities to occur on the site. The location of the site on the western perimeter of the Parklands avoids impact on the main north-south circulation and access network that runs through the Parklands. The site is in the Wallgrove Precinct which comprises services land and industrial facilities not accessible to the public. The main walking and cycling routes through the WSP are located east of the site with the M7 cycle track located adjacent to the western perimeter of the site. However, although direct path linkages through the site have not been included to this stage of the design, the design has allowed for a visitor and education centre. The landscape design offers an attractive site for visitor experience, from the entrance and along the eastern area to the visitor and education centre. Further, adequate cycle parking and end-of-trip facilities will be arranged within the office component of the site. This will support employees wishing to travel to the site via bicycle, who can use the M7 shared path to access the site safely. Information will also be issued as part of the Green Travel Plan to improve awareness of the surrounding cycling routes. The site layout will have a paved path connecting from the entrance to the visitor and education centre, so pedestrians and cyclists can access the proposal site safely.
Environmental protection works	A Biodiversity Development Assessment Report (BDAR) (**Technical report Q**) has been prepared as part of this EIS and identifies management measures to protect biodiversity. These include the development of a Flora and Fauna Management Plan, incorporating design measures to avoid and mitigate biodiversity impacts (design footprint and configuration) and construction measures such as preparation of management plans that address potential impacts (Erosion and Sediment Control Plan). Landscaping and visual assessments developed as part of this EIS align with the ecological profile of the wider WSP, with suggested mitigation measures to reduce and manage the impacts of the proposal on the landscape, views and visual amenity. Key mitigation strategies include, reducing the bulk form of the facility, incorporating living walls into the architecture and screening around the perimeter of the site to block direct views. A Vegetation Management Plan has also been prepared for this EIS (Appendix G to **Technical report Q**) which supports the restoration of the overland flow path on site, through realignment, to achieve natural channel design principles, revegetation actions and weed management. Revegetation actions will include plantings of species representative of the threatened Cumberland Shale Plains Woodland community (in alignment with site landscaping). Onsite contamination will be remediated in line with the draft RAP prepared for the site, as detailed by the *Contaminated Land Management Act 1997* and SEPP 55 Remediation of land.
Potential Aboriginal and non-Aboriginal cultural and heritage interpretation	An Aboriginal Cultural Heritage Assessment Report (**Technical report O**) has been prepared as part of the EIS. There is potential for interpretation of these findings to be incorporated in detailed design, including, but not limited to plaques, murals, paving, visitor and education centre display.
Utilities infrastructure	The proposal is a form of utilities infrastructure, giving a source of electricity generating as well as waste processing infrastructure.
Key Management Priorities:	
Environmental Protection and Land Stewardship	
Work with State Government agencies to improve water quality in Eastern Creek	The proposal will improve the existing overland flow path and re-plant with native vegetation, with associated water quality benefits. The overland flow path drains to Reedy Creek to the north. The proposal will also include bio-retention and onsite detention to manage the flow and quality of stormwater to the overland flow path and on to Reedy Creek. As Reedy Creek joins with Eastern Creek further north, these measures will also improve the water quality in Eastern Creek (see **Chapter 12 Hydrology and flooding** for further information).
Further investigate the area's Aboriginal and non-Aboriginal cultural heritage	An Aboriginal Cultural Heritage Assessment Report has been prepared as part of the EIS (**Technical report O**). The assessment included a review of existing archaeological investigations, Aboriginal community consultation and assessing the cultural significance of Aboriginal heritage for the proposal. The assessment concludes that there are no Aboriginal archaeological sites within the proposal area due to high levels of previous disturbance, and the potential for areas of Aboriginal archaeological potential are very low. Similarly, there are no non-Aboriginal heritage features located at the site which could be potentially impacted by the proposal.

Land use policies, strategies and plans	
Relevant provisions	**WSERRC proposal**
Community Participation and Engagement	
In association with the development of recreation or sports facilities as they are developed, increase visitation, precinct activation and engagement and its recreation or environmental uses	Community engagement started during the early stages of proposal planning and has continued throughout the development of this EIS. Engagement will continue following lodgement of the EIS. Before the EIS start, community research was conducted to understand the issues, ideas, and sentiment relevant to the community. It also asked the community how they wanted to be engaged during the EIS with the findings from this research informing the approach to community engagement. Further information on community engagement can be found in **Chapter 6 Engagement**. A community reference group (CRG) will be formed for the proposal, responsible for administering a community funding package among other duties. The funding package would be designed to invest in infrastructure for Western Sydney and give back to those residents closest to the facility. The areas for investment would include environmental projects to offer solutions for urban heating, sporting infrastructure and community recreation.
Financial Sustainability and Economic Development	
Explore the potential for WSPT Business Hubs at sites designated by the Trust	The proposal aligns with the direction of supporting Business Hubs by providing energy to support nearby future development in line with WSP businesses and other facilities. The applicant will also create a community reference group (CRG) responsible for administering a community funding package. The funding package would be designed to invest in infrastructure for Western Sydney and give back to those residents closest to the facility. The areas for investment would include environmental projects, sporting infrastructure and community recreation.
Manage the impacts of future service infrastructure expansions in the Precinct	The location of the proposal on the western perimeter of the WSP, adjacent to the M7 and existing industrial facilities and on land of low environmental or recreational value, will avoid the areas of the WSP that are used for recreation and which support the aims of the District Plan to integrate the Green Grid with the WSP. The approach to the architectural and landscape design is motivated by the concept of integrating the proposed facility thoughtfully into the local and district wide context and offering education through a world-class visitor and education centre experience and facility tour. The site design includes clearing and revegetation with native species of the overland flow path. This will contribute to better water quality outcomes in the overland flow path and to the water quality of Reedy Creek to the north. The EfW facility is an enclosed design where all impacts relating to odour and noise are minimised by being contained within the EfW building. Covered waste trucks will enter the enclosed reception hall via fast moving roller shutter doors which will be kept under negative pressure to prevent odour escape, and unload waste directly into the waste bunker. A detailed site contamination investigation (DSI) was carried out and is documented in **Technical report G**. The investigation concluded that all soil, water and gas concentrations were within the adopted site assessment criteria, except for asbestos impacted soils, asbestos containing materials (ACM) found in near surface soil and lead exceeding the environmental investigation level (EIL) beneath one of the workshops. A draft Remediation Action Plan (RAP) (included as **Technical report G2**) was prepared for the site and will be carried out to make the site suitable, from a contamination risk perspective, for the proposed land use before construction. In addition, when first acquiring the site, it was found that the proposal site had an Individual Biosecurity Direction (IBD) due to the site having been detected previously for Salmonella Enteritidis (SE) due to past poultry activities. The applicant has since received a letter from the Department of Industries (DPI) dated 26 May 2020 which stated '*The NSW DPI Chief Veterinary Officer has approved the status of your property to change from a SE Infected Premise to a Resolved Premise, as you have completed decontamination and two sets of SE negative clearance sampling*' and as such, the Individual Biosecurity Direction has been revoked on the proposal site.

2.6 Consideration of alternatives

The avoidance and minimisation of environmental impacts has been a key driver in the selection of the site, the choice of EfW technology and the layout and design of the facility.

The main issues of concern to the community and stakeholders, based on experience of other EfW projects and confirmed through the engagement process, are the potential impacts of the proposal on air quality and health, visual impacts, as well as understanding how EfW supports recycling and resource recovery.

Air quality and health issues are addressed by adopting combustion and flue gas treatment technologies that are consistent with best available techniques as defined by the EU BREF, coupled with a site selection strategy that sought to maximise the separation distances to residential areas. Regarding visual impacts, the design of the facility has employed a few design strategies to reduce the mass and bulk of the facility and its visual impact from surrounding areas.

The alternative technologies, designs and site selection process which supports these outcomes and responds to key community concerns are described in detail below. The role of EfW in supporting recycling and resource recovery is described earlier in this chapter.

Further information on how the proposal considers specific issues raised by the community and stakeholders during engagement is available in **Section 6.3** of **Chapter 6 Engagement**.

2.6.1 Do-nothing

The ‘do nothing’ scenario was considered as an alternative to the proposal. Adoption of this scenario would result in the continued disposal of residual waste to landfill, reducing the life of Sydney’s landfills and continuing the burden of landfills on the environment and communities. The do-nothing scenario is not in line with the WARR targets of the NSW Government because if the proposal was not to proceed, 500,000t of residual MSW and C&I waste proposed to be processed at the WSERRC would otherwise be disposed of to landfill every year. The NSW waste hierarchy and WARR Act identifies the treatment of waste for the purposes of energy as a more suitable option compared to landfill. Accordingly, the ‘do nothing’ scenario was discounted.

2.6.2 EfW as part of an integrated waste management strategy

EfW does not displace or preclude higher-order steps in the waste hierarchy and is complementary to the other steps when considered as part of an integrated waste management strategy. Transitioning to a circular economy for waste aims to make sure that products are designed to eliminate waste and pollution, and that products and materials keep circulating in the economy at their highest value for as long as possible. This is done through reuse, repair, remanufacturing, recycling, and similar activities.

When products and materials can no longer be circulated and become residual waste, the energy embodied in the waste can be harnessed, metals recovered and recycled, and ash recycled before finally disposing of the residues in landfill. As circular economy principles influence the design of materials and products in the future, these materials can be reused and recycled, reducing the amount of waste generated. However, options to manage residual waste will continue to be necessary, including EfW.

Experience from European countries with high levels of recycling confirms the complementary role of EfW as part of an integrated waste management solution. It is not possible to fully recycle and compost municipal waste. Leading countries such as Germany, Netherlands and Denmark achieve recycling rates of up 66% of their waste[17], with the remaining recovery being from EfW. In the Australian context, the WARR Strategy has set a target of increasing the waste diverted from landfill from 63% in 2010–11 to 75% by 2021–22. However, current data shows actual performance of 55% diversion rates in the Metropolitan Levy Area (refer to **Table 2.1-1**). Achieving landfill diversion rates beyond this will need investment in waste infrastructure such as EfW, while pursuing long-term strategies to embed circular economy principles in product design that will enable higher rates of reuse and recycling in the future.

As noted earlier, the European Commission published guidance on the role of EfW in the circular economy (26.1.2017 COM (2017) 34). The main aim of this guidance document was to ensure that recovery of EfW in the EU supported the objectives of the Circular Economy Action Plan and was guided by the waste hierarchy. This document recommends that member states should prioritise investment in separate collection and processing infrastructure to enable high-value recycling within Europe, with a focus on separate collection of organic waste. In addition, in some specific and justified cases, for example with materials that contain certain substances of very high concern, disposal or energy recovery may be preferable to recycling.

[17] OECD, *Australian National Waste Report 2018*

For member states with low or non-existent EfW capacity and ongoing reliance on landfill, it indicates that new EfW infrastructure could be an appropriate element of the long-term resource management system in line with waste hierarchy and circular economy objectives. The WSERRC proposal is consistent with this guidance as it offers solution to achieving higher rates of landfill diversion, while having the flexibility to accommodate increased source separation, particularly of organics, over the long term.

Several councils and businesses within the Sydney region send their mixed general red-bin waste to be processed at an alternative waste treatment facility (AWT) or mechanical-biological treatment facility (MBT). MBTs process red bin waste to recover the organic content which is called mixed waste organic outputs or MWOO. However, in 2018 the NSW EPA revoked the resource recovery exemption order for use of MWOO on agricultural land and suspended its use for forestry or mine site rehabilitation purposes.

As the organic material originated from a mixed waste stream, it was considered that the risks of using organic material from residual waste on agricultural land outweigh the benefits. This development indicates that the feasibility of the recycling of mixed waste for application to land is questionable and the optimal waste management system is a combination of source separation of recyclable materials (including FOGO) with EfW processing options for residual materials only. Landfills will always have a place within the waste hierarchy but should be designated solely for disposal of EfW outputs and materials that cannot be recycled.

Development of EfW capacity in New South Wales would support the achievement of landfill diversion targets, preserve the limited landfill capacity available for the disposal of materials with no other available management option and delay the need to start new landfill sites, which has proven highly challenging for the Sydney region.

2.6.3 Flexibility of waste feedstock

As recycling rates increase over time through market development and in line with NSW WARR strategy targets, circular economy principles, EfW operations will need flexibility to accommodate changes in waste feedstock to continue to offer landfill diversion of residual waste. Modelling completed for the proposal indicates that even with the introduction of additional source separation and maximised resource recovery within the Sydney region, there would still be enough residual waste feedstock for the proposal. Cleanaway supports increased source separation for high-quality recovery and recycling. The WSERRC feedstock strategy and process design accommodates increased source separation over time, particularly of organics. In this way, the WSERRC proposal expects to accommodate improvements in both recycling and landfill diversion.

The design of the facility is also modular in that it incorporates two lines, so if one line goes offline, the facility can continue to operate.

Feedstock modelling has been completed for this proposal and is included in **Technical report E Waste Flow Analysis for Greater Sydney,** with a summary available in **Technical report C Waste and Resource Management Assessment.** The modelling results demonstrate that there is significantly more waste feedstock available in the Sydney Basin than the 500,000tpa design capacity of the WSERRC proposal. There are several other EfW facilities proposed to service the Sydney Basin. They include the proposed Dial a Dump Industries (DADI) Next Generation facility in Eastern Creek and the proposed SUEZ Botany Cogeneration facility in Matraville. The Next Generation facility EIS states that it will process and thermally treat up to 552,000t of non-putrescible residual waste sourced from construction and demolition (C&D), C&I sources as well as shredder floc. The Botany Cogeneration facility scoping report states that it will process and thermally treat up to 165,000t of feedstock made up of processed engineering fuel (PEF) and residuals from the Orora recycled paper mill. The PEF will be sourced and prepared from non-putrescible C&I waste.

The proposed feedstock for the WSERRC facility differs from both other proposals in that it will thermally treat residual putrescible and non-putrescible waste from MSW and C&I sources. These modelling results indicate that the Sydney Basin, even with increased source separation, reduction in waste generation per capita and meeting recycling targets, will still generate significant quantities of residual waste that will need to be managed. The WSERRC proposal along with the other proposed EfW facilities will give the opportunity to manage a portion of the residual waste generated and support diversion of waste from landfill. The WSERRC also has significant flexibility to secure waste from both putrescible and non-putrescible MSW and C&I sources in comparison to the other proposals which rely on non-putrescible waste only. The proposal has been sized to offer a viable residual waste management infrastructure solution, while not needing to attract or cannibalise waste that can be effectively and economically reused, repaired or recycled.

Refer to **Chapter 5 EfW policy** which discusses the proposals short-term and long-term waste feedstock strategy.

2.6.4 Alternative EfW technologies

2.6.4.1 Consideration of thermal treatment technologies

Cleanaway and Macquarie Capital reviewed operational EfW facilities around the world to identify a technology that was reliable and with a proven track record in terms of operational, technical, human health and environmental performance. This EfW technology review was focused on the following criteria:

- Technologies commonly used in the European Union (EU) given the similarities with the NSW waste market and the close alignment between the two jurisdictions in their approach to regulating EfW
- Reputable technology with available reference facilities
- Ability to achieve strict environmental performance standards and be compliant with BAT recommendations and the NSW EfW policy
- Reliability and proven technology at scale
- Ability to be flexible and manage a variable waste feedstock
- Costs.

The review identified five main technologies for the thermal treatment of waste to generate energy, these are:

1. Moving grate combustion
2. Fluidised bed combustion
3. Gasification (thermal and plasma)
4. Pyrolysis
5. Two-stage combustion.

Table 2.4 below summarises each technology and gives high-level commentary against a range of criteria on which judgement was based.

Table 2.4: Summary of thermal treatment technologies considered for WSERRC

Parameter	Moving Grate Combustion	Fluidised Bed Combustion	Gasification (Thermal and Plasma)	Pyrolysis	Two-stage Combustion
Short description	Combustion of waste on a moving grate furnace.	Combustion of waste on a fluidised bed (usually fluidised using sand).	Gasification of waste to generate a synthetic gas which can be combusted either in a boiler or a gas engine.	Pyrolysis of waste to generate a synthetic gas, char and synthetic oil.	Gasification process immediately followed by combustion above the fuel bed or in an adjacent chamber.
Operation – At least 12 months fully operational at design loads	Yes – well proven with over 2,000 lines in Europe, US, Japan and China combined.	Yes – well proven but less than 100 facilities (at scale) and mostly based in Europe and US.	Yes, mostly in Japan with a few operational facilities in Europe. Relatively high operational cost and low energy recovery.	Yes, mostly in Japan. Relatively high operational cost and low energy recovery.	Some facilities under construction in Europe and some operational in Japan. Some European facilities currently being commissioned.
Historical Track Record	Good – Operating data available over many years showing successful operation.	Good – Operating data available over many years showing successful operation.	Mixed – good record with homogeneous feedstock in Asia. Poor track record in Europe, however some new facilities emerging in the UK.	Emerging technology, several failed projects in Europe. Poor track record.	Emerging technology, insufficient data for long term track record with some technical issues noted.
Waste Streams – suitable for mixed MSW and C&I from the Sydney area	Yes	Yes	No, without significant pre-treatment.	No, without significant pre-treatment.	No, without significant pre-treatment.
Emissions – Compliant with EU BAT	Yes	Yes	Yes	Yes	Yes
IBA slag/ash has Total Organic Carbon ≤3% and Loss on Ignition ≤5% (dry basis)	Yes	Yes	Yes	Yes	Yes

Parameter	Moving Grate Combustion	Fluidised Bed Combustion	Gasification (Thermal and Plasma)	Pyrolysis	Two-stage Combustion
Flue gas retention time (Minimum 850°C for 2 seconds)	Yes	Yes	Not applicable, generates syngas and oil	Not applicable, generates syngas and oil	Yes
Energy Efficiency (greater than 25% achievable on a gross basis)	Yes	Yes	Yes	Yes	Yes
Summary	Taken forward for further analysis below due to proven technology status and good track record.	Taken forward for further analysis below due to proven technology status and good track record.	Not considered further due to mixed track record, poor performance in numerous European facilities and requirement for extensive pre-treatment to make the waste feedstock more homogenous.	Not considered further due to emerging technology status, lack of available reference facilities and requirement for extensive pre-treatment to make the waste feedstock more homogenous.	Not considered further due to emerging technology status, lack of available reference facilities and requirement for extensive pre-treatment to make the waste feedstock more homogenous.

Based on this assessment, it was concluded that gasification, pyrolysis and two-stage combustion were not suitable at this time due to the relative immaturity of the processes, lack of available reference facilities and requirement for extensive pre-treatment to make the waste feedstock more homogenous.

Two technologies were shortlisted for this proposal:

1. Moving grate combustion
2. Fluidised bed combustion.

These technologies were shortlisted because they can comply with emissions regulations and have a proven track record of safe, reliable and environmental performance.

A more in-depth analysis of moving grate combustion and fluidised bed combustion was carried out with the following key findings:

- There are significantly more operating plants globally for moving grate combustion technology (for mixed MSW and C&I waste) (see **Table 2.4**). Over 95% of facilities thermally treating MSW and C&I waste to produce electricity worldwide use moving grate technology.
- Although fluidised bed combustion can process a wider array of different fuels from an energy content (calorific value) perspective, the fluidised bed combustion process requires a more homogenous fuel stream. When waste is used as the fuel, pre-treatment in the form of shredding is necessary to produce a smaller, more homogenous particle size than would be needed with moving grate technology.
- Fluidised bed technology uses hot sand as a fluidising medium. This is broken down and must be replaced over time generating a solid waste stream.
- Operational availability of a fluidised bed facility is slightly lower than a moving grate facility (7,500 hours vs 8,000 hours).

After careful consideration, moving grate technology was selected as the preferred technology. It the most recognised and proven technology used globally for over 50 years, and in that time it has continually improved responding to regulatory, industry and public demands with operational advantages, compared to fluidised bed technology.

2.6.4.2 Consideration of flue gas treatment system techniques

As well as the overall combustion technology selection, other technologies embedded within the EfW facility itself were also reviewed such as the flue gas treatment (FGT) technology (cleaning system) and NOx abatement technologies.

FGT refers to the treatment of dust, acid gases, heavy metals, dioxins and furans before release from the stack. The two main FGT concepts available on the market are referred to as a dry system or a wet system. However, numerous variations for these two systems exist. For this proposal, the three most common FGT system variants were reviewed. These were:

- Base semi-dry system
- Semi-dry system with additional wet scrubbing stage
- Wet system.

A base semi-dry system includes the following main equipment:

- Water spray for conditioning of flue gases
- Reactor for injection of either hydrated lime or sodium bicarbonate and activated carbon for reduction of acid gases and capture of heavy metals, dioxins and furans
- Filter bag house to remove dust (boiler fly ash that is entrained within the flue gases) and FGTr.

A semi-dry system with an additional wet scrubbing stage includes the same equipment as the base semi-dry solution with the addition of a wet scrubbing stage using a sodium hydroxide and water solution to further reduce acid gases and heavy metal concentrations within the flue gas. The wastewater from this process can be recycled back into the semi-dry part of the process, so there is no additional water use as part of this wet scrubbing process over a semi-dry solution.

A wet system is substantially different. A wet system uses a variety of wet scrubbing stages (usually two or three) to treat the flue gases. The main components of a typical wet system are:

- Dust removal, either using an Electrostatic Precipitator or bag filters
- Quench water stage to cool the flue gases for further treatment and remove mercury
- Wet scrubbing stages with activated carbon injection to remove pollutants including dust, acid gases, heavy metals, dioxins and furans
- Secondary dust removal.

These systems represent different forms of Best Available Techniques (BAT) under the European Union Industrial Emissions Directive within the Waste Incineration (WI) BAT Reference Document (WI BREF). They are able to meet the upper emissions limit values set out in the WI BREF. Each was analysed against a variety of criteria, as summarised in **Table 2.5** below, to determine the preferred solution for the WSERRC facility.

Table 2.5: FGT comparison

Parameter	Base Semi-dry	Semi-dry with wet scrubber	Wet System
Suitable for proposed waste types	Yes	Yes	Yes
Proven technology	Yes	Yes	Yes
Operational performance and availability	Good	Good	Good
Flexibility to handle short-term variation in waste characteristics	Possible difficulties with maintaining consistently low Sulphur Dioxide	Good – scrubber acts as an additional polishing stage	Good
Emissions performance	Compliant with EU WI BREF upper limits	Better than base semi-dry, particularly regarding acid gases and heavy metals.	Similar performance to semi-dry system with wet scrubber.
Future proofed against tighter emissions limits	No	Yes	Yes
Wastewater stream generated	No	No – recycled into process.	Yes – wastewater treatment needed.

After consideration of the different FGT technologies for WSERRC, a semi-dry system with additional wet scrubber was chosen because:

- The base semi-dry system was discounted as there was concern that WI BREF emission limit values, particularly for sulphur dioxide, could be temporarily exceeded if there was a change in waste characteristic over a short period of time, causing a change in the characteristics of the raw flue gases. In addition, the use of either a semi-dry system with a wet scrubber or a wet system offers an element of future proofing against potential tightening of emission limit values as they result in lower emissions than a semi dry system.
- The fully wet system was discounted as it had similar characteristics to a semi-dry system, but with a wet scrubber it creates a wastewater stream and uses additional water. In addition, there was no viable point of discharge for the industrial wastewater near the WSERRC site.

2.6.4.3 Consideration of oxides of nitrogen (NO_x) reduction techniques

The proposal also needed to consider which technology would be applied to reduce oxides of nitrogen (NO_x).

There are two applicable technologies that can be applied for the reduction of oxides of nitrogen within the flue gases. Both technologies operate under the principle of breaking down oxides of nitrogen into nitrogen and water (both harmless elements) to reduce the volume of oxides of nitrogen (NO_x) within the cleaned flue gases, using ammonia or urea. The two technologies are:

- Selective Catalytic Reduction of NO_x (SCR), which uses a special catalyst to break down NO_x
- Selective Non-Catalytic Reduction of NO_x (SNCR), which uses injection of ammonia to break down NO_x without the need for a catalyst.

Both technologies are described as ‘Best Available Techniques’ (BAT) within the WI BREF for Waste Incineration and both are commonly used in Europe.

The WSERRC facility has chosen to use SNCR for the following reasons:

- SNCR achieves the upper WI BREF NO_x limit of 120mg/Nm^3.
- SNCR is described as BAT in the WI BREF.
- SNCR achieves significantly lower emission levels than the requirements for NO_x emission under New South Wales POEO legislation (500mg/Nm^3).
- SNCR is a simpler technology than SCR. SCR systems are complex to operate, need more intensive maintenance than SNCR systems and are more complex to maintain.
- SNCR achieves a higher energy efficiency overall. A tail end SCR system requires reheating of the flue gases for proper operation of the catalyst, not necessary in SNCR technology, which uses energy that would otherwise be used for electricity generation. A front-end SCR system requires dust removal using an electrostatic precipitator. The electrostatic precipitator uses electricity that would not be necessary in a SNCR system and is then less energy efficient.

The reference facilities for this proposal, Dublin Waste to Energy and Filborna Waste to Energy, which are fully described in **Chapter 5 EfW policy,** both use the SNCR technology.

2.6.5 Alternative sites

The proposal site located at 339 Wallgrove Road, Eastern Creek was selected as the preferred site following a detailed and systematic site screening analysis completed between July 2018 and October 2019. The site screening analysis was based on a set of selection criteria aimed at identifying potential sites in the wider Sydney region that would be suited to the development of an EfW facility. After shortlisting numerous potential sites throughout the wider Sydney region, further environmental constraints investigations and due diligence assessments were completed to identify any risks to acquisition of these sites based on technical, social and environmental considerations.

2.6.5.1 Multi-criteria analysis

To screen for potential sites, a multi-criteria analysis was used which involved mapping sites against standard criteria for making infrastructure investment decisions in New South Wales. The criteria used to map initial sites for discussion was based on the following principles:

- Land use zoning that allows for an EfW facility
- Proximity to sensitive receivers (>1km buffer)
- Sites with a minimum area of 5ha
- Proximity and access to main roads and rail corridors (within a 1km buffer).
- Proximity to power lines.
- Proximity to the source of waste generation
- Planned future development in the vicinity of the site.

Sites that had larger separation distances from sensitive receivers were favoured to minimise the possible risk to health from exposure to emissions from electricity infrastructure associated with the proposal, such as electric and magnetic fields (EMF), noise, and air emissions from the EfW process.

Sites that complied with the above selection criteria were mapped for further consideration and those sites that did not satisfy the criteria were excluded from further assessment. Over 140 sites were originally identified and mapped for consideration. Various internal workshops have been conducted to discuss and prioritise the mapped sites against the selection criteria.

As a result, 25 locations were identified, which were subsequently narrowed to 9 preferred areas. Further workshops and desktop research were conducted to prioritise sites within these preferred areas that better addressed environmental risks, stakeholder concerns, approvals risk, utilities access considerations, geotechnical aspects, ease of construction, and feedback during early community consultation.

It was also imperative to select a site that is located in an area that is expected to accommodate the majority of the population growth forecast for Sydney, motivated in part by the development opportunities created by the Western Sydney Airport and Western Sydney Aerotropolis. The location of a site in this growth region and close to established waste management infrastructure will minimise the transport distances (and related GHG emissions) between the sources of waste, waste processing facilities and the proposal.

The areas were further narrowed to three main areas including:

- Aerotropolis area
- Mulgoa area
- Eastern Creek area.

Table 2.6 summarises the key features of the short-listed areas considered during the site selection process and explains why Eastern Creek was ultimately selected.

Table 2.6: Pros and cons for the areas considered

Area	Pros	Cons	Outcome
Aerotropolis area	• Sites close to the Western Sydney Aerotropolis Agribusiness Precinct were prioritised for the proposal given the potential to offer a source of energy and heat to the commercial activities planned for the precinct. • Ability for the proposal to contribute to the management of waste for the wider Aerotropolis • Away from residential suburbs • Large lots of land.	• The planning framework for airspace protection (Obstacle Limitation Surface) restricted the location of tall structures such as a stack, near the Airport. • There was a 3km wildlife buffer to manage the risk of wildlife strikes to planes which limited available sites in the area. • Lack of suitable major roads • Large scale residential developments • Future transport corridors which had potential to cut through preferable sites • Rural residents near preferred sites.	Discounted as an option and no investment made
Mulgoa area	• Large lots of land.	• The north-west region of the Aerotropolis comprises an area with residents owning large, rural properties • Although the Aerotropolis industrial zone is immediately adjacent, the number of sensitive receivers in the vicinity creates challenges from a community relationship perspective.	Discounted as an option and no investment made
Eastern Creek area	• This area was suited to building a stack that would not affect aircraft operations for the Western Sydney Airport. • Industrial and commercial nature of the area creating the potential for synergies with surrounding industry • Other waste facilities in the area.	• Public perception and heightened community awareness and sensitivity existing and planned waste management assets in the Western Sydney region.	Site identified at 339 Wallgrove Road, Eastern and noted as the most suitable site to develop an EfW facility.

2.6.5.2 Environmental constraints analysis and due diligence

Before deciding on the purchase of any shortlisted site, a due diligence analysis was completed. This process was significant because it highlighted any potential critical constraints and helped with:

- De-risking acquisition and supporting investment outcomes
- Understanding the receiving environment that may be impacted by the development
- Understanding likely community responses to the development
- Informing regulatory and agency discussions
- Identifying any issues to be addressed during the environmental assessment process.

A desktop environmental constraints analysis was completed on the prioritised sites within the three main areas, using publicly available databases and information to assess the following:

- Road access and transport infrastructure, and potential traffic routes into the property
- The size/area of property
- Existing or future land use conflicts
- Zoning and permissibility to support the development
- Proximity to utilities
- Considerations of noise and air pollution risks to nearby residents/properties
- The presence of Aboriginal and non-Aboriginal heritage listed sites
- The presence of threatened species
- The extent of vegetation removal and/or earthworks that would be necessitated
- Soils, geology and contamination
- Surface and ground water features
- Bushfire risk.

2.6.6 Preferred site

The proposal site chosen via the extensive site screening analysis is located at 339 Wallgrove Road in Eastern Creek, NSW (Lot 1 DP 1059698) within the Blacktown local government area (LGA) (see **Figure 1.2** in **Chapter 1 Introduction**). The site was recognised as the most suitable site to develop an EfW facility for various reasons as discussed below in **Section 2.6.6.2**.

2.6.6.1 Site history

Before 1960, the site was vacant of buildings and was similar in use to the surrounding land use, being predominantly rural. In the early 1960s, the site was cleared of vegetation with warehouses and ancillary sheds built on the southern end of the site. The present-day farm dam located near the eastern boundary was built during this time.

In the 1970s, the site was first used for chicken farming. Large chicken coups were built, and the existing warehouses were expanded during this time. The site continued to be used predominantly for agricultural purposes.

In the early 2000s, the surrounding area continued to be developed for industrial activities. Similarly, the site has been used for various industrial and agricultural activities including truck/vehicle storage, miscellaneous debris storage and chicken farming.

Currently, two hectares of the northern part of the site are paved. Disused poultry sheds and ancillary buildings occupy the southern portion of the site, with mature vegetation along the eastern boundary and a man-made farm dam occupying the eastern part of the site (see **Figure 1.4** in **Chapter 1 Introduction**).

A previous development approval (DA-12-316) was granted allowing a shed associated with agricultural use to be constructed on the proposal site. The shed was never constructed, and the development approval is no longer valid.

A search of the BCC development register and the POEO public register found no existing development consents or EPLs for the proposal site.

2.6.6.2 Site suitability

The site's location in the Wallgrove Precinct of the Western Sydney Parklands was favourable due to the site being previously used for industrial purposes and the industrial and commercial nature of the surrounding land uses, mitigating aesthetic and amenity impacts and creating the potential for synergies with surrounding industry. For instance, the site is located next to waste facilities such as the now-closed Eastern Creek landfill site to the north and north-east and the GRL waste management facility immediately to the east. To the west of the site is the Eastern Creek industrial area and to the south is the Austral Bricks facility.

This site is located near to existing industries, including waste management industries, which benefit from their distance to residential areas and the low environmental or recreational value of the area surrounding the site.

The site is of an optimal size and configuration to design an EfW facility, being a rectangular-shaped lot. Compared to other sites investigated, this site was suitable for building a sufficiently well dispersing stack that would not affect aircraft operations for the Western Sydney Airport.

The site would avoid existing and planned residential areas, rural land uses and future airspace restrictions. The site was preferable from an air quality perspective as its distance from sensitive residential and other receptor locations would enable better management of emissions within air quality criteria. The closest residential areas are about 1km to the south of the site, with Erskine Park residential area located about 3.5km to the west and Minchinbury – about 3km to the north. Horsley Park Public School is over 2km south of the site and a childcare centre is within the Eastern Creek industrial area, about 1km to the west of the site. Refer to **Figure 7.1** for a map showing the sensitive receptors.

There is also no significant elevated terrain in the medium distance (3–6km). It is noted that emissions from stacks tend to have their greatest impact on nearby elevated locations which was taken into consideration when choosing a preferred site. This site meant that a generally shorter and less visible stack can be used in this location without compromising the local air quality. Of all the possible available locations that were assessed (via screening level air quality modelling), this location resulted in the least impact in terms of population exposure. Any other comparable locations were ruled out due to constraining factors, such as plume rise impacts on aircraft.

The site's location next to transport infrastructure such as the M7 Motorway and Wallgrove Road is also favourable as it allows for convenient road transport access routes and minimises the possible effects on nearby receivers from site truck traffic.

Furthermore, its location in Western Sydney also means that the site is in an area that is expected to accommodate most of the population growth forecast for Sydney, motivated in part by the development opportunities created by the Western Sydney Airport and Western Sydney Aerotropolis.

The location of the site in this growth area and close to established waste management infrastructure such as the Erskine Park Waste Transfer Station, minimises the transport distances (and related GHG emissions) between the sources of waste, waste processing facilities and the proposal.

2.6.7 Alternative site layout

Alternatives to the site layout were prepared during the development of the concept design. This was due to various site constraints, to allow for safety in design for operational activities and the aspiration to offer both an excellent visitor experience and working environment. The following points outline the site constraints that were considered and shaped the final preliminary site layout as shown in **Figure 3.3** in **Chapter 3 Proposal description**.

- The eastern portion of the site along the boundary is low-lying and modelling shows that it sits within the 1% AEP (100yr) flood event. Buildings and infrastructure located in this area would therefore be flood prone.
- A small strip of land not part of the proposal site divides the site into a 2.04ha northern section and a 6.19ha southern section. This dividing strip is part of the adjacent lot and includes a right of carriageway benefitting the proposal site, allowing vehicles to move between the two parts of the site. However, because this strip of land has a different owner, physical structures cannot be built on, over or under this land, which limited the layout and design to being contained within the 6.19ha southern section.

Options to locate the tipping hall closest to the southern boundary of the site with the stack located in the north-east corner of the site were also considered. However, this option wasn't chosen due to the need to maximise the space between the site entry and the tipping hall in order to maximise this space for internal truck queuing, reducing the impact on public roads and intersections.

Architecturally, there was always a vision to have the visitor and education centre in the eastern portion of the site overlooking the basins and areas of vegetation. The alternative to this was locating the visitor and education centre in the shaded western part of the site adjacent the M7 which was dismissed due to noise impacts on visitors and was inconsistent with the visitor experience aspirations of the design.

Alternative site access options

Alternative site access arrangements were also considered as part of the site layout.

During the initial design period, four alternative site access options were investigated. These included two different access points off the Austral Bricks Road along the southern boundary and two different access points off the Eastern Creek Waste Management Facility road along the northern boundary. Any accesses from the eastern and western boundaries of the site were dismissed due to these areas being bounded by the operational GRL facility to the east, and the Westlink M7 motorway to the west.

Road design guidelines applicable to the M7 stipulate that for a dual carriageway, the desirable minimum distance between an on-ramp and off-ramp is 900m. An existing on-ramp is located adjacent to the northern part of the site, and the nearest location for a compliant on-ramp would be several hundred metres south of the Warragamba Pipelines.

Two alternative site access options were investigated from the north of the proposal site. The first option included the creation of a new junction from the main access serving Eastern Creek Waste Management Facility. The access road would run through undeveloped land, cross the right of carriageway in the proposal site, and enter the EfW facility at the north-west corner of the southern 6ha section of the proposal site. The second option considered access from the north-east of the site via the GRL site access road. The site access road would branch off the GRL access road, entering the northeast of the proposal site, crossing the right of carriageway and entering the site at the north-east corner of the southern 6ha section.

Both access options from the north were discarded for the following reasons:

- The need to carry out works to make it safe for heavy vehicles to cross the right of carriageway. The proposal does not own this strip of land and so would need the approval of the landowner, SUEZ.
- The northern access would be on land currently being used for a composting operation.
- The existence of a utilities easement on land that would be used for the northern access places restrictions on how that land can be developed
- Long-term plans to rehabilitate the land to the north and return this land to the WSPT
- The construction and operation from this access would disrupt and complicate traffic management of the existing waste management facilities.

Two alternative site access options were investigated from the south of the proposal site.

The first option comprised retaining the existing access road located in the southwest corner of the site, upgraded as needed.

The second option involved a new access road crossing the Warragamba Pipeline corridor, about 90m east of the existing access road, either via a new bridge crossing of the Pipeline or encasing the Pipeline in concrete. The eastern option was discarded due to construction risk associated with piling work creating new restrictions on future upgrade works for the pipelines.

The first option comprised retaining the existing access road located in the southwest corner of the site and upgrading this via carriageway widening within the footprint of the existing, load-rated concrete encasement. This was ultimately selected as the preferred option.

This option aligns with the overarching principles of the Guidelines for Development Adjacent to the Upper Canal and Warragamba Pipelines and avoids placing new restrictions on future upgrade works for the pipelines.

The preferred access solution has been agreed in principle with WaterNSW. Ongoing consultation will continue with WaterNSW to agree on the detailed design and construction methodology.

2.6.8 Alternative design

An Architecture and Landscape Design Strategy Report has been prepared for the proposal and is included as **Appendix B**.

The architectural design work to date only represents the beginning of the design process and sets the direction for further refinement.

The architectural team has worked closely with the wider technical specialists to understand the technical parameters of the facility to make sure that these operational requirements of the facility are fully integrated into the overall design.

The design responds to the SEARs and has been influenced through engagement with stakeholders such as architectural staff from BCC. Following direction from the Western Sydney Parklands Trust, the design also provides for the continuation of green areas through the site.

As part of Arup's iterative design process, 2D and 3D software has been used to test design options and refine the concept. Regular design reviews have been conducted to provide robust and diverse critique. Regular progress updates have been given to stakeholders including BCC and the community through a video which gives an overview of the design.

The key areas covered in the early stage design work were the integration of the built form into the existing local context, ensuring steps were taken to mitigate the visual bulk of the building, and focus on the human experience for passers-by, employees and visitors.

Initially, four key design aspirations were identified and described. These align with the wider proposal aspiration and set the priorities for the design outcome. All subsequent design moves were determined by and critiqued against these aspirations to make sure they were in alignment.

The design aspirations are as follows:

1. Embrace innovation:

- Lead the way in the use of world class sustainable technologies
- Become a catalyst for high-quality design and innovation in Western Sydney
- Promote a circular economy
- Create an exemplar facility.

2. Integrate with the context:

- Positively contribute to and integrate with existing and the emerging local character of the area
- Ground the building into the unique local context
- Shape the built form to mitigate visual impact
- Select materials which complement and align with the local environment.

3. Invigorate the wider ecosystem:

- Benefit the local ecosystem and microclimate
- Responsibly manage the site through the handling of stormwater and the reuse of collected rainwater
- Focus the landscape planting strategy around the use of native trees and shrubs to reinvigorate native biodiversity.

4. Include a generous human interface:

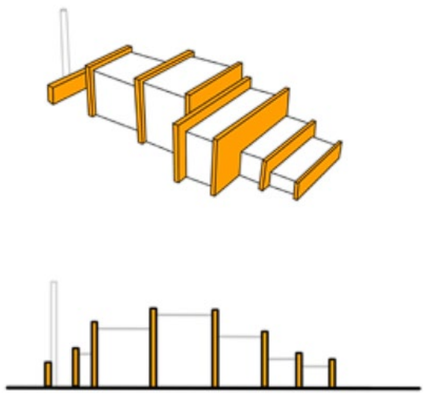
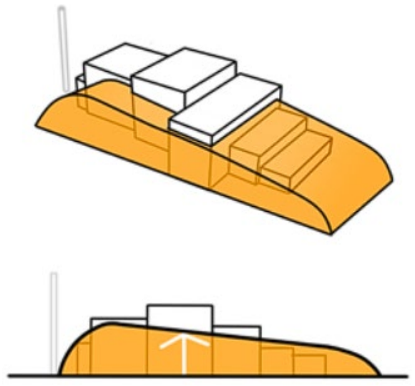
- Be honest and transparent about the purpose of the facility
- Carefully consider the buildings appearance from key public viewing points
- Offer an excellent visitor experience to educate and inspire.

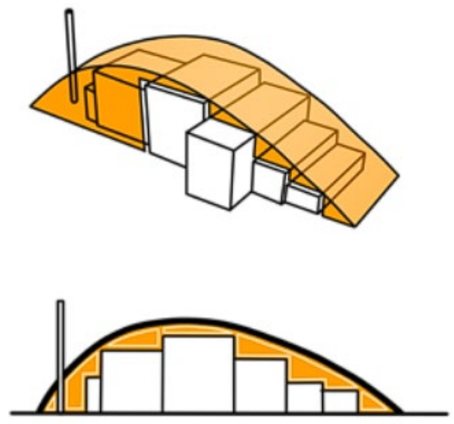
Early in the design process, alternative approaches to the envelope and massing of the building were considered. These options were modelled and tested to assess their visual impact from viewpoints in the local area. The team also worked closely with the Visual Impact Assessment team to locate and refine the built form to further minimise the buildings visual impact.

The early massing options which were explored are presented below in **Table 2.7**.

Initial materials guidelines have been developed in the EIS to set the expectation for the visual characteristics and sustainable properties of materials. Final materials will be selected in the upcoming detailed design stage, and these must consider sustainable procurement practices, as well as demonstrate exemplar sustainability credentials, including the consideration of the materials source, manufacturing processes, embodied carbon, lifecycle and end of life strategy. This is particularly significant for the large areas of cladding to the main building. The visitor and education centre is proposed to be of timber construction which has relatively low embodied carbon. A green roof is also proposed along with green walls on the northern and southern sections of the EfW building. The use of rammed earth is suggested for the main wall dividing the visitor and education centre from the vehicular route. If possible, the rammed earth would be made from earth excavated from the site, or at the very least from the local area.

Table 2.7: Design options for building façade

Design Option	Pros	Cons	Schematic
Layered 'blades' SELECTED MASSING APPROACH	• Building façade maintains functional form of the building. • Vertical subdivision breaks up building bulk. • The blades capture functional volume neatly. • Opens opportunity for further design options in between blades. • Perceived mass of the building is reduced from main viewing angles. • Building integrates with the landscape.	• The building mass is not unified.	
Landscape manipulation	• Minimises visual building form by lifting the landscape.	• Building bulk increases at lower levels. • Disruptive to the landscape • Significant impact to local ecosystem and watershed • Non-cost-effective use of resources • Reduced transparency of the activities that occur within the building and thus lost educational opportunities.	

Design Option	Pros	Cons	Schematic
Curved 'shell'	• Unifies overall building mass.	• Perceived building size is larger because the overall scale of the form increases as the cladding does not wrap tightly to the massing of the facility. • The curved canopy captures a large amount of airspace. • The eye is drawn up and along the curved from and is attracted to the tallest part of the building. This has the potential to increase the apparent mass of the building. • Sun reflectivity from the curved form may present a safety issue. • There is no opportunity to conceal roof mounted plant and equipment as the roof scape is highly exposed from the adjacent road.	

Of the design options shown in **Table 2.1**, the first design option (layered 'blades') was chosen to further develop the building design. This was due to the advantages outlined in the table and due to the design aligning with the design aspirations noted previously. The layered blades approach uses a series of vertical blade walls which incrementally rise from the landscape. The tallest section is in the centre of the building. The use of the 'blades' interrupts the large façades, so they are more visually interesting and less bulky, as well as breaking up the mass from key viewing corridors on the M7 in the north and south directions.
To further soften the building's appearance from the road and connect it to the landscape, the northern and southern ends of the building will be covered in living green walls. The design tightly wraps the building, eliminating any wasted space. Once the building is subdivided in this manner, the facades in between the blades will be clad in materials to break up mass.

The areas in between the blades are to be clad in materials which become increasingly transparent as you move along the building. This expression follows the internal process, supporting the WSERRC's function as an educational resource.

2.6.9 Alternative stack height and location

Assessing alternative heights and locations for the stack on the proposal site was based on several considerations, including site layout, process operations, architecture, visual amenity, structural considerations and air emission dispersion conditions.

Two principal site layout options were tested regarding the location of the stack:

1. A site layout that situated the waste receiving tipping hall to the north of the site and the stack to the south of the site.
2. A site layout that situated the waste receiving tipping hall to the south of the site and the stack to the north of the site (opposite configuration to option 1).

The first option was selected as the preferred option because the south of the site is at a slightly higher elevation, facilitating the stack on a higher part of the site and thus improving overall emissions dispersion. This layout was also beneficial to other operational parameters of the facility such as maximising space for vehicles to queue within the proposal site rather than on public roads, and process operational flow.

Once the site layout was determined, the next consideration was whether to integrate or separate the stack from the southern area of the built form and where to place it in the context of the building form.

Factors considered were:

- An integrated stack requires significant transfer structures to allow for access underneath.
- A stack off the central axis would have resulted in longer and unsymmetrical ducting/pipework that would impact the performance of the stack, including the stack exit temperature.
- A standalone stack requires ducting and piping to connect to main process but minimal transfer architectural and structural treatment to tie it to main building form.

Based on the above considerations, the decision was to proceed with a stand-alone stack centred to the southern end of the main building axis with a low-level architectural treatment. This was preferred architecturally and simplified the structural design. In addition, the central location of the stack is preferable as it is in line with the built form and when viewed from the primary viewing corridor along the M7, the stack is largely obscured to south bound motorists and cyclists. For northbound traffic, the lower portion of the stack is set against the silhouette of the main building, noting that the sun path is to the north, so the southern face of the stack is typically in shadow. The addition of a large green wall at the southern end of the building also conceals the lower portion of the stack and associated tanks at ground level.

It is noted that previous air quality modelling reviewed emission dispersion from various stack heights, ranging from 30m to 90m tall. The stack height was mainly dictated by the receiving air quality conditions and dispersion needed to meet best practice emission limit values. For this site, a 75m stack height was chosen, which achieved permissible air quality emissions and adequate dispersion to have no unacceptable impact on air quality and human health.

Chapter 3

Proposal description

3 Proposal description

3.1 Overview

The proposed Western Sydney Energy and Resource Recovery Centre (WSERRC) (the proposal) is an Energy from Waste (EfW) facility designed to thermally treat up to 500,000tpa of residual Municipal Solid Waste (MSW) and residual Commercial and Industrial (C&I) waste streams that would otherwise be sent to landfill. This process would generate up to 58MW of base load electricity some of which would be used to power the facility itself with up to 55MW exported to the grid. A proportion of the electricity generated would be categorised as renewable.

The proposal involves building of all onsite infrastructure needed to support the facility including site utilities, internal roads, weighbridges, parking and hardstand areas, stormwater infrastructure, fencing and landscaping.

The facility will use established and proven EfW technology. Moving grate technology has been chosen as the means to thermally treat incoming waste to recover energy and advanced flue gas treatment technology will be installed as the means to clean air emissions. Moving grate technology has been used globally for over 50 years and in that time the technology has been improved continually, responding to regulatory, industry and public demands.

The NSW EfW Policy Statement[1] (NSW EfW policy) states that

'to ensure emissions are below levels that may pose a risk of harm to the community, facilities proposing to recover energy from waste will need to meet current international best practice techniques.'

This proposal has been designed to meet the European Industrial Emissions Directive (IED) (directive 2010/75/EU of the European Parliament)[2] and the associated Best Available Techniques (BAT) Reference document for Waste Incineration[3] (BREF) which sets the European Union environmental standards for waste incineration as published on 3 December 2019. The EU Commission Implementing Decision (2019/2010) on the 12 November 2019 states the best available techniques (BAT) conclusions as the main element of the BREF and prescribes them to be adopted by Member States. Additionally, the facility will comply with the technical criteria set out in the NSW EfW policy (refer to **Chapter 5 EfW policy**).

---

[1] https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/epa/150011enfromwasteps.pdf
[2] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32010L0075
[3] https://eippcb.jrc.ec.europa.eu/sites/default/files/2020-01/JRC118637_WI_Bref_2019_published_0.pdf

The BREF sets emission limits for several emission parameters which are more stringent than previous versions of the BREF responding to continuous improvements to emission control technology and practices. The BREF limits are also considered more stringent than existing NSW POEO requirements. This proposal has been designed to, at a minimum, meet the limits set in the IED and associated BREF. Compliance with the newly published BREF is world's best practice regarding environmental performance of EfW facilities. To future proof the facility against more stringent standards in the future, the proposal will use a wet scrubber which is a sophisticated flue gas treatment technology able to clean the flue gases to a level that surpasses currently accepted best-practice standards. The distributed control system (DCS) and continuous emissions monitoring system (CEMS) design will allow the flue gas treatment process to respond to variations in the flue gas to maintain stack emissions within regulated emission limits.

As part of the maintenance of the facility, the proposal will consider adopting new and proven technologies that may provide an improvement to the facility when technically and commercially applicable. As such the design has been developed to allow for such improvements during the facility's lifetime and thus allowed for ongoing continual improvement.

For example, the facility has been designed in a way that allows components to be upgraded in response to advancements in EfW technology and equipment, so the facility can continue to operate in line with leading best practice. The design also includes enough space and flexibility to maintain, remove and replace components easily and safely that may differ in dimensions from the original equipment. The modular nature of the design means that components can be removed and replaced without removing the entirety of the process plant and equipment. The equipment specified in the design is suitably sized to allow some changes in the process control. The process design can also accommodate enhanced treatment consumables should they become available.

This chapter describes the proposal, including the construction, site layout and operation of the facility. Key design drawings and plans are included in **Appendix C**. The key components of this proposal are outlined in **Table 3.1**.

The proposal, as described in this EIS, has been designed to achieve a high level of environmental performance consistent with the BAT as described in the EU BREF 2019. The international design team has significant experience in the design and environmental assessment of EfW facilities overseas and in Australia.

A contractor, or series of contractors, will be appointed to develop the detailed design and build the proposal consistent with the development consent.
The contractor(s) will be needed to demonstrate experience designing similar facilities and must comply with conditions of consent and an ISO 14001 certified Environmental Management System.

In addition, a suitable operator with experience in managing an EfW facility in compliance with environmental performance standards will be appointed to partner with Cleanaway to operate the proposal.

The selected operator must demonstrate that they are eligible to hold an EPL, having regard to the requirements of the *Protection of the Environment Operations Act 1997* (POEO Act). The operator will also need to operate the proposal in line with Cleanaway's Environmental Policy and independently certified ISO 14001 Environmental Management System, reflecting Cleanaway's commitment to achieving a high level of environmental performance at its facilities. It is the intention for Cleanaway to hold the EPL who will be supported by the specialist contractor also capable of holding an EPL.

Table 3.1: Key components of the proposal

Key Component	Description
Proposal area	The entire site totals 8.23ha which is split into a 2.04ha northern section and a 6.19ha southern section, divided by a strip of land not part of the proposal site but which includes a 'right of carriageway' benefiting the site. The proposal area will be fully contained in the 6.19ha southern portion of the site as shown in **Figure 3.3.** Works to occur on the 2.04ha northern section of the site include the clearing of weeds and exotic vegetation within the existing overland flow channel which is confined to the eastern section of this parcel of land. The northern section will also be used temporarily to support construction works. It is not currently expected that any other works will occur on the 2.04ha northern section of the site as part of this proposal.
EfW facility infrastructure	The main civil and structural elements of the proposal will include the EfW building housing the waste bunker and all process plant and equipment, administration building and visitor and education centre, substation, utilities connections, drainage, foundation design, internal roads and hard standing.
Waste feedstock	The proposal would thermally treat up to 500,000tpa of residual Municipal Solid Waste (MSW) and residual Commercial and Industrial (C&I) waste streams that would otherwise go to landfill. The bunker will have enough capacity to store up to a maximum 17,000t of waste feedstock on site at any one time.

Key Component	Description
Energy	The proposal is designed to generate about 58MW of electricity on a gross basis. Some of the electricity generated will be used to power the facility itself. This is expected to be in the range of 3MW to 5MW of electricity which means that the facility is designed to output between 53MW and 55MW of electricity to the electricity grid. A proportion of the electricity generated would be categorised as renewable.
Ash management	The EfW process creates the following ash by-products: • Incinerator Bottom Ash (IBA): to be captured on site with ferrous metals recovered. The remaining IBA will be collected and transported to a dedicated offsite IBA processing facility and may be incorporated into construction products such as road base, subject to further investigation. This IBA processing facility is under investigation for consideration only and would be subject to a separate development application process and does not form part of the scope of this application. See **Chapter 22 Related development.** • Flue gas treatment residues (FGTr): to be captured, transported for pre-treatment at a hazardous solid waste treatment facility before being disposed of to a licenced restricted solid waste landfill facility. • Boiler fly ash: part of this ash stream is captured with the IBA and part of this ash stream is captured with the FGTr and transported for disposal according to the ash type it is collected with as noted above.
Waste feedstock transport	Waste feedstock will be transported to the site by heavy vehicles either from a pre-processing facility such as the Cleanaway Erskine Park Waste Transfer Station (85–87 Quarry Road, Erskine Park) or direct deliveries from kerbside collections. The expected route between the Cleanaway Erskine Park Waste Transfer Station and the proposal site would be via Lenore Drive and Old Wallgrove Road (also known as the Erskine Park Link Road) which has had significant recent upgrades.
Thermal treatment technology (moving grate)	Moving grate technology is a common form of EfW technology where the waste is passed through the combustion chamber by a moving grate to enable the complete combustion of the waste material.
Construction and operating hours	Construction: works generally carried out in standard working hours or subject to specific conditions that may be included in the EPL: Monday to Friday: 7am to 6pm Saturday: 8am to 1pm No work on Sundays or public holidays Any works taking place outside of the standard working hours would be in line with the Interim Construction Noise Guideline (ICNG, DECC, 2009). Operation: 24 hours per day, 7 days a week.

Key Component	Description
Workforce	Construction: it is estimated that the proposal will create 900 direct construction jobs over the 3-year construction period and in addition between 700–1200 indirect construction jobs. Operations: about 50 full-time equivalent employees and contractors at peak operations.
Site access	Existing access to the site is via a dedicated access road off Austral Bricks Road adjacent to the site's southern boundary. The road crosses over the Warragamba Pipeline Corridor to enter the site from the south. The site access needs to be upgraded to accommodate the traffic movements associated with the proposal. The proposed solution for site access is widening the existing site access on the Eastern side with no additional covering of the pipelines and improving the tie-in to the Austral Bricks Road. The preferred access solution has been agreed in principle with Water NSW. Ongoing consultation will continue with WaterNSW to agree the detailed design and construction method. Site access works do not form part of this EIS and is discussed in **Chapter 22 Related development**.
Water supply	Potable water mains will provide clean water supply to the WSERRC. Potable water mains will serve the external fire and water tanks. A separate pressurised pipe network will connect the fire and water tanks to the relevant systems within the EfW building and visitor and education centre. To supply the proposal site with water, connections to offsite utilities and services is needed, these connections do not form part of this proposal and are discussed in **Chapter 22 Related development**.
Water and wastewater management	Water handled onsite, including process water from the EfW process, will be reused onsite. A gravity sewer system will convey wastewater from welfare facilities in the EfW building and visitor and education centre to a pump station located within the site. A pressurised pipe will discharge flows from the pump station to the Sydney Water sewer outside of the proposal site boundary. The connection offsite does not form part of this proposal and are discussed in **Chapter 22 Related development.**
Communications	A comprehensive Control and Monitoring System which supports the automated operation of the facility will be installed. The operation of the CEMS requires an extensive communication network. To enable the continuous operation of the EfW facility and to mitigate the effect of external factors, a hard-wired telecommunications connection has been proposed via a Fibre to the Premises (FTTP) NBN connection. This is discussed further in **Chapter 22 Related development.**

Key Component	Description
Electricity supply	Electricity reticulation infrastructure, including underground high voltage cables for distribution, switching equipment and low-voltage infrastructure will be installed. The WSERRC is designed to generate about 58MW of electricity on a gross basis (between 53MW and 55MW of this electricity will be exported to the electricity grid). Some of the electricity generated will be used to power the facility itself (3MW to 5MW). To allow generated energy to be exported to the electricity grid and to allow electricity to be supplied by the electricity grid when the facility is not operating (for example in facility start-up or shut-down for maintenance) a substation will be constructed on site and a new connection to the electricity grid is needed. Different options for connection have been discussed with network operators. Three feasible route options to connect the WSERRC to the grid have been identified by Endeavour Energy. This comprises two 33kV options and one 132kV option. All options have been deemed to be technically feasible offering a viable connection to the local transmission network. An electrical connection to the high voltage network is related development (refer to **Chapter 22 Related development**).
Related development	This EIS seeks approval for the construction and operation of the WSERRC as described in this chapter. A few additional developments referred to as related development, are needed to support the operation of the WSERRC or may be subject to further investigation. These will be assessed and determined through separate approval processes under Part 4 or Part 5 of the *Environmental Planning & Assessment Act 1979*. The additional proposals that comprise related development are discussed in **Chapter 22 Related development** and include: • Processing facility for the pre-processing of waste before delivery to the WSERRC • IBA processing and secondary metals recovery facility • An electrical connection to the high-voltage network • Water and sewer connections • Telecommunications connections • Site access works.

3.2 Construction

This section indicates how the proposal would be constructed, including the likely method, staging, workforce, plant and equipment. Detailed construction plans, consistent with the indicative plans described here, will be prepared following the appointment of a contractor and prior to any demolition or construction works. The proposal would be built and managed by a contractor in accordance with an approved Construction Environmental Management Plan (CEMP) prepared in response to the conditions of consent, and in line with relevant safety management requirements. The CEMP will cover environmental performance, management and monitoring requirements supplemented by aspects such as building demolition, vegetation removal and protection of biodiversity, contamination management, farm dam management, stockpile management, erosion and sediment control and protection of the Warragamba pipeline corridor.

A Community management strategy will also be developed through the construction phase, which will include the set-up of a Community Reference Group (CRG), contact protocols and communication strategy with nearby neighbours, residents and businesses.

3.2.1 Construction overview

Pending approval, design and construction activities are expected to start in Q4-2021 and it would take up to 3 1/4 years (39 months) to complete, subject to any unforeseen delays.

The proposal would likely be built in five phases to reflect contractor requirements, material and equipment availability, and program and delivery schedules. Constructing in phases would also allow for effective site and environmental management. The main phases of construction comprise:

- Phase 1: Demolition
- Phase 2: Site establishment and enabling works
- Phase 3: Main construction works
- Phase 4: Testing and commissioning works
- Phase 5: Finishing and landscaping works.

Although construction works are likely to occur in phases, the operational phase of the proposal would not be staged. Full operations will begin once construction (along with testing and commissioning) is complete.

3.2.2 Construction methodology

3.2.2.1 Phase 1: Demolition

The demolition phase will begin at the start of the construction process and take about three months.

In the demolition phase, initial works would include the construction of site perimeter fencing and security, sediment and erosion control measures to protect the pipeline corridor, realignment of the overland flow path, provision of truck wheel-wash facility and set-up of initial site sheds. The public, businesses, Council and other stakeholders would be notified before work starts. Demolition work would be carried out in line with Australian Standard AS 2601—2001 The Demolition of Structures.

Demolition equipment, including excavation machinery and trucks, will be used to remove existing vegetation, buildings, tanks and services. Specialist equipment and methods will be used where hazardous and/or contaminated materials are encountered. General building and demolition waste, as defined under the NSW *Protection of the Environment Operations Act 1997* (NSW Government, 1997), would be managed in line with the NSW EPA guidelines.

3.2.2.2 Phase 2: Site establishment and enabling works

Following initial clearing and demolition, site establishment and enabling works would be carried out to prepare the site for construction. This phase is likely to start before completion of Phase 1 with some Phase 2 activities to occur concurrently with demolition.

The main site establishment and enabling works comprise:

- Environmental protection works
- Site establishment, including construction of site compounds, hardstand and laydown areas, temporary internal and external roads and car parks
- Site remediation in line with the RAP
- Permanent site security fencing
- Bulk earthworks across the site
- Services location and reticulation
- Stormwater management
- Piling and foundations.

Each of the above elements are described in more detail below.

Environmental protection works

The Contractor must carry out environmental protection works and environmental management activities to meet the requirements of the approved CEMP. Construction mitigation measures to mitigate and manage the potential environmental effects in construction are consolidated in **Chapter 24 Summary of management and mitigation measures.**

Site establishment

Site establishment works will be carried out before the start of substantial construction to make the construction site ready and will include construction of ancillary facilities as well as ensuring protection of the public. An initial rudimentary site establishment for the demolition and clearing works may include portable sheds and facilities. For the main site, construction site establishment works are expected to include the following:

- Removal of redundant services
- Construction site fencing and hoardings
- Installation of sediment and erosion control
- Site offices, crib rooms and services
- Site access roads, hardstands, security fencing, gates, locks and signage
- Construction car park and site support buildings
- Set up of construction monitoring equipment
- Relocation and protection of utilities which run through the site.

Site remediation

A desktop review of the proposal site history and site investigations in 2015, 2019 and 2020 have been completed. This is reported in the due diligence investigations (**Technical report G3**) and a Detailed Site (contamination) Investigation (DSI) (**Technical report G**).

The DSI concludes that the proposal site is considered to have a low water and vapour contamination risk and a low to moderate risk for soil contamination, primarily in the form of soil asbestos.

A draft Remediation Action Plan (RAP), included as **Technical report G2**, was prepared for the site and will be applied to render the site suitable, from a contamination risk perspective, for the proposed land use before construction and in line with the State Environment Planning Policy No 55 – Remediation of Land (SEPP 55).

Permanent site security fencing

The permanent site security fence will be erected as soon as practical, wherever it will not need to be removed for access. In those locations where access is needed, a temporary security fence will be set-up.

Bulk earthworks and spoil disposal

The major components of construction waste to be extracted from the site will include waste materials from demolition as well as clean and contaminated soil from site clearing, bulk earthworks and piling. It is intended that all suitable excavated material, excluding weeds and rubbish, will be reused onsite as fill material.

Bulk earthworks will include stripping topsoil and bulk cut to fill activities, excavation for the waste bunker and preparation and compaction of working platforms, typically limestone sub-base. Topsoil will be stockpiled onsite for later use.

Preliminary design suggests that the proposal will need a small net volume of imported fill. The preliminary material volumes for bulk earthworks are shown in **Table 3.2**.

Table 3.2: Preliminary earthworks material quantities

Material Classification	Approx. volume
Reuse of in-situ materials	$50{,}000m^3$
Imported fill material	$11{,}000m^3$
Unsuitable Material removed from site	$4{,}000m^3$

Material designated suitable for reuse comprises a mix of excavated rock, excavated cut to fill and residual soils. Any excavated materials reused onsite, or imported from another proposal, would be subject to testing and exemption provisions defined under the Waste Classification Guidelines (NSW EPA, 2014). Should the material be classified as a controlled or restricted waste or found to contain contaminants of concern at elevated concentrations, it would not be classified for exemption and reuse and instead be stored in a contained separate location onsite before being transported offsite to a licenced facility. Refer to **Chapter 10 Waste management** for further details.

Stormwater management

The existing overland flow path which runs from south to north along the eastern site boundary will be maintained but realigned and formalised as a revegetated trapezoidal channel with a 300mm deep low-flow meander in the base. It is anticipated that the use of 40t excavators, backhoes and pipe laying teams would be employed to facilitate construction of the stormwater management system.

The detail of water management in construction will be included in the CEMP in response to a condition of consent.

Piling and foundations

Piled foundations will be required for several areas of the proposal. Before starting the piling, the site will be prepared, including construction of temporary ground stabilisation works and hardstand areas to allow all-weather access for piling rigs, mobile cranes and delivery trucks.

While final pile design is not complete, a continuous flight auger (CFA) piling rig is likely to be used to install 600mm to 900mm diameter piles. Piling is likely to be undertaken concurrently in more than one location, and later slab foundations, bunker walls and building works will begin progressively as completed pile areas become available.

3.2.2.3 Phase 3: Main construction works

This phase is likely to start progressively and proceed concurrently in Phase 2 activities as areas of the prepared site become available.

The main construction works will comprise:

- Structures works (concrete and structural steel)
- Process halls, process plant delivery, installation, testing and commissioning
- Fuel and water storage and reticulation
- Materials handling (conveyors)
- Stack
- Finishes, including facades, roofing and internal finishes
- Ancillary services, including mechanical, electrical, HCAC, external substation and in-ground services
- Visitor and education centre
- Internal operational roads and carparks.

Details of the above elements are described below.

Structures works (concrete and structural steel)

Concrete construction will typically be used for pile caps and building foundations, ground slabs, machine foundations, bunker and boiler house walls, stair cores, suspended slabs and buttress walls. The bulk of the concrete structure will be constructed using standard concrete placing methods and will occur regularly throughout the construction period in standard hours.

Concrete will be delivered by agitator trucks and placed using concrete boom pumps to access the location.

Structural steel columns and beams will form the main frame for each section of the facility with steel roof trusses and secondary steelwork erected to support roof, wall cladding, operating plant and equipment.

All waste receival, handling, processing and storage area floors will be impermeable.

Process halls and materials handling conveyors

Elements of the specialised operating plant to be installed include boilers, flue gas treatment equipment, air-cooled condensers, ash handling equipment, tanks, silos and generators and transformers. These will typically be installed on pre-prepared equipment foundations built to supplier specifications.

Some elements are complex and require a specific assembly sequence and temporary supports or fixings to maintain stability. As some of these operations must proceed to completion in a continuous process and cannot be completed within a single working day, out-of-hours construction may be needed.

Fuel and water storage reticulation

A series of above-ground tanks, pipework and ancillary spaces will be incorporated within the site for fuel and water storage. Prefabricated tanks will be delivered to site, and in some cases will entail large loads requiring special road access permits. They will be placed on pre-prepared foundations using mobile cranes.

Stack

The proposed stack would be approximately 75m in height and comprise an outer steel structure with two separate flues (fibreglass inner linings). This will be constructed using mobile cranes and specialist access equipment and ideally will proceed as a continuous operation until the overall stability of the structure is achieved. For this reason, erection and stabilising of the stack structure cannot necessarily be completed within a single working day and out-of-hours construction may be needed for 2 to 3 days.

Finishes, including facades, roofing and internal finishes

The façade comprises a mix of solid elements (concrete and brick finishes), perforated metal cladding and glazed elements, as well as green walls and timber elements. Urban design treatments will be incorporated in elements of the final design.

Facades will arrive as prefabricated components to be assembled and installed on site. Other walls include the rammed earth wall, double brick walls and blockwork walls which will generally be constructed in-situ using scaffolds to allow safe access to work areas.

Ancillary services

The substation will be constructed on a piled raft foundation to avoid unnecessary excavation of and concomitant materials handling.

Construction of the substation foundation and pads will utilise general earthworks machinery, including excavators, dozers for spreading, compactors, grader and smooth-drum roller with water carts used to assist with watering for compaction when required.

Concrete construction using standard concrete placing methods will typically be used for pile caps, ground slab and equipment foundations. Concrete will be delivered by agitator trucks and placed using concrete boom pumps to access the required location.

The substation building will be constructed with double skin blockwork and outer layer brick walls using traditional low-rise building techniques with use of access scaffolds, backhoes and excavator.

In-ground service mains (stormwater, water, process water, fire, piping) will typically be installed in concrete trenches cast within the structure slabs and buried in conduit in trenches or directly buried external to the main building. Installation of services will be done by subcontractors and coordinated on site to suit the overall construction program and other activities.

Visitor and education centre

The visitor and education centre comprises a mix of architectural and construction types, including timber construction supported on a ground bearing slab, concrete lift core and a rammed earth blade wall.

Internal roads and carparks

Internal roads, carparks and truck coupling and de-coupling areas will be constructed using general earthworks machinery. Concrete and asphalt pavements will require delivery and placing of concrete using agitator trucks and asphalt delivered by road and placed by a specialist subcontractor. Incoming and outgoing weighbridges are incorporated within the external hard standing and will be installed into pre-prepared concrete pits within the concrete pavements using mobile cranes.

3.2.2.4 Phase 4: Testing and commissioning of works

This phase will start progressively on completion of the relevant main construction works and proceed concurrently with Phase 5. On completion of installation, testing of all major process components, including emission control systems, will be done. The main testing and commissioning activities include:

- Preparation of a Proof of Performance Plan
- Input/Output (I/O) testing
- Commissioning of individual pieces of equipment
- Commissioning of systems
- Commissioning and functional testing of whole facility
- Testing and commissioning of CEMS
- Proof of performance trials.

After commissioning has been successfully completed and signed off by the engineering team, a series of performance tests can begin. The exact testing regime and proof of performance trials will be consistent with a proof of performance (PoP) plan prepared in response to the conditions of consent, but will likely include:

- Testing performance of all major process component, including emission control systems, to make sure that the facility is operating within the specified emissions limits
- Set-up of all criteria for operation, control and management of the abatement equipment to assure compliance with the emission limit values specified in the EPL
- Confirming that all measurement equipment of devices used for the purpose of forming compliance have been subjected, in situ, to normal operating temperatures to prove their operation under such conditions
- Noise testing to make sure approved noise limits are achieved
- General performance testing to make sure that the facility is operating within the expected parameters
- Demonstrating that the proposal is compliant with the relevant licences and approvals as well as environmental and safety criteria.

The intention of all commissioning, testing and proof of performance trials is to facilitate environmental performance and that the facility will operate as designed and approved.

3.2.2.5 Phase 5: Finishing and landscaping works

Some aspects of this phase are likely to start before completion of Phase 3 as site areas become available. The main finishing and landscaping works elements include:

- Completion of internal roads and carparks
- Truck coupling and decoupling areas
- Landscaping.

Operational roads will have largely been completed in Phase 3 before testing and commissioning. Outstanding internal roads and visitor carpark will be completed as areas become available.

Nearing completion of construction, the final fit-out and landscaping phases will include minimal plant such as bobcats, backhoes, and smaller excavators. Trucks importing soil may also be needed.

3.2.3 Indicative construction timeline

The overall construction timeframe is expected to be 3 and ¼ years (39 months). **Figure 3.1** outlines the main stages of construction and an indicative timeframe for each stage.

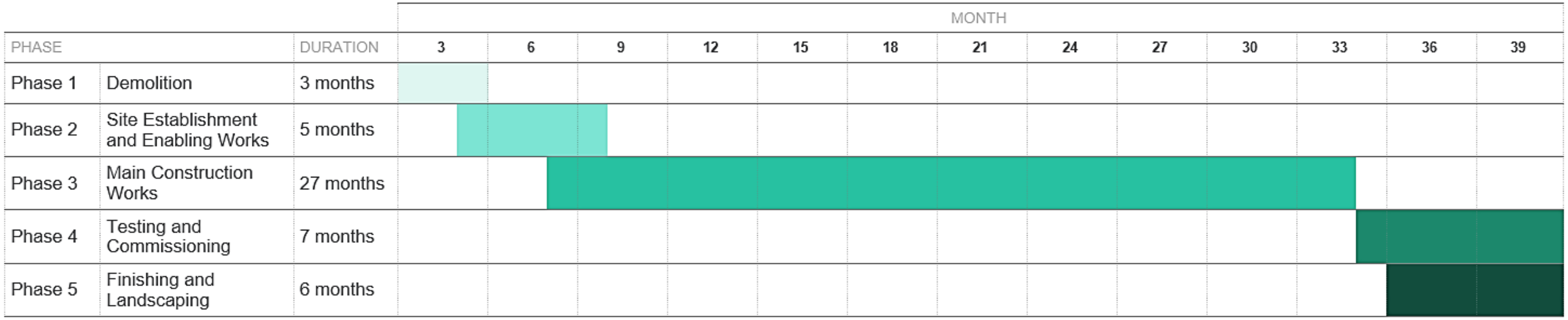


Figure 3.1: Indicative timeframe of construction stages

3.2.4 Workforce

The construction workforce will comprise trades and construction personnel, subcontract construction personnel and engineering, functional and administrative staff. Workforce size will vary across the day and throughout the phases of construction. It is estimated that the proposal will create 900 direct construction jobs over the 3-year construction period and between 700–1200 indirect construction jobs.

Table 3.3 shows assessed peak and average workforce numbers for each construction phase (accounting for workforce distribution and overlapping of some phases).

Table 3.3: Peak and average workforce predictions

Phase	Peak	Average
Demolition	20	20
Site preparation and enabling works	40	40
Main construction	600	300
Testing and commissioning	200	130
Finishing and landscaping	40	40

3.2.5 Construction hours

Construction would largely be carried out in standard working hours or subject to specific conditions that may be allowed within a consent:

- Monday to Friday: 7am to 6pm
- Saturday: 8am to 1pm
- Sundays and public holidays: no work.

For any activities where longer work hours are required, requests for construction work to be undertaken outside of the above hours will be made, such as for:

- Utility diversions or upgrades, where effects to existing services cannot be otherwise reasonably managed within standard working hours
- Large concrete pours (for example, bunkers) where concrete is poured continuously over periods of 24-hour operation over several days
- Delivery of oversized plant and equipment (tanks, stacks, crawler cranes and large earthmoving equipment) which need to travel on New South Wales roads outside of EPA recommended construction hours. Such activities will be conducted in line with NSW Police and TfNSW requirements which many include out-of-hours movements when vehicle numbers on the network are lower.

- Installation of oversized plant which needs to be installed safely and sequentially, using cranes in a very specific order to maintain stability and safety at all stages of installation and assembly
- Safety works, including mandatory safety inspections, carried out before operatives starting work on a daily and ongoing basis. These inspections will also occur after the operatives have completed works each day.
- Emergency works to avoid the loss of life, property and/or to prevent environmental harm.
- Maintenance and utility works where out-of-hours work is specified by the Utility stakeholder
- Maintenance of specialist construction plant.

Any works taking place outside of the standard working hours would be done in accordance with the Interim Construction Noise Guideline[4].

3.2.6 Plant and equipment

The plant and equipment needed to build the proposal would be finalised by the contractor, with details included in the CEMP. The plant and equipment that would be used, and is typical to any major construction proposal, would likely include:

- Backhoe loader
- Bulldozer (Cat D8 to Cat D10 or similar)
- Chain saws
- Concrete saws
- Diesel generator
- Dump truck
- Excavator
- Excavator hammers
- Mobile crane
- Pumps
- Truck and dogs
- Water cart
- Hand tools
- Compactors (Cat 835 or similar)
- Concrete boom pump
- Concrete trucks

[4] ICNG, DECC, 2009.

- Concrete vibrator
- Front end loaders (FEL)
- Graders (Cat 14G to Cat 16G or similar)
- Piling rigs (bored piles)
- Padfoot roller
- Vibration roller
- Forklifts and road profiler.

3.2.6.1 Water consumption

A high-level assessment of the likely water demand in the construction phase has been completed. Major water usage on site would arise from:

- Construction staff (potable water)
- Construction staff (non-potable water)
- Water to support earthworks and road construction, including dust control and embankment conditioning
- Washdown of trucks and other plant before leaving site
- Miscellaneous usage.

In the construction phase the average monthly water use is estimated to be 630m^3 with a maximum of 1,240m^3 and minimum 30m^3. Total expected water demand for the construction phase is about 22,500m^3 (22.5ML).

To meet the non-potable demand, there is potential for some water to be retained onsite, given the location and site drainage characteristics of the existing site and proposals to fill in an existing pond and install alternative site drainage paths and storage. It is likely that retained stormwater would be used for civil activities such as dust control.

3.2.7 Traffic management

There are temporary traffic management and access controls needed in construction. These controls would be installed at various points depending on location and staging. The final controls would be developed in the detailed design and applied under a Construction Traffic Management Plan (CTMP). A draft CTMP including heavy vehicle movements is available in Appendix A to **Technical report K Traffic and Transport Assessment Report**.

A mix of vehicles will be used to build and service the construction works, including heavy vehicles, cranes, cars, utes and trucks. It is expected that all vehicles will be able to park onsite.

It is estimated that an average of about 45 heavy vehicles per day (88 daily heavy vehicle movements) are expected to travel to the site across the three-year construction period. Isolated construction activities, including major concrete pours, would result in an absolute peak of 75 heavy vehicles (150 heavy vehicle movements) for up to 10 days. Heavy vehicles would include rigid trucks, truck and dogs and semi-trailers.

Heavy vehicle movements on local roads will be minimised as much as possible and restricted to designated haulage routes which would be via Wallgrove Road and the Westlink M7 Motorway.

Generally, no specific temporary traffic control or pedestrian arrangements are expected to be needed on the public road network. However, specific controls for special deliveries, such as for cranes, may be needed and would be done in accordance with NSW Police and Transport for NSW requirements.

3.2.8 Site compounds

Areas for site compounds, initial construction laydown, hardstand areas and workforce parking will be included at the site.

The main site compound will be located to the eastern side of the site, so that it is clear of the overland flow path. In later stages of construction, part of this area will become the construction site for the visitor and education centre and air-cooled condenser (ACC).

An area for temporary stockpiles in the bulk earthworks and detailed excavation works is designated on the northern portion of the site. Part of this area may be retained as a temporary stockpile area until later in the construction period and will eventually be used for construction of road pavements.

3.2.9 Construction footprint

The detailed layout of the construction site will be developed for the proposal before construction. **Figure 3.2** shows an indicative construction site layout and footprint**.**

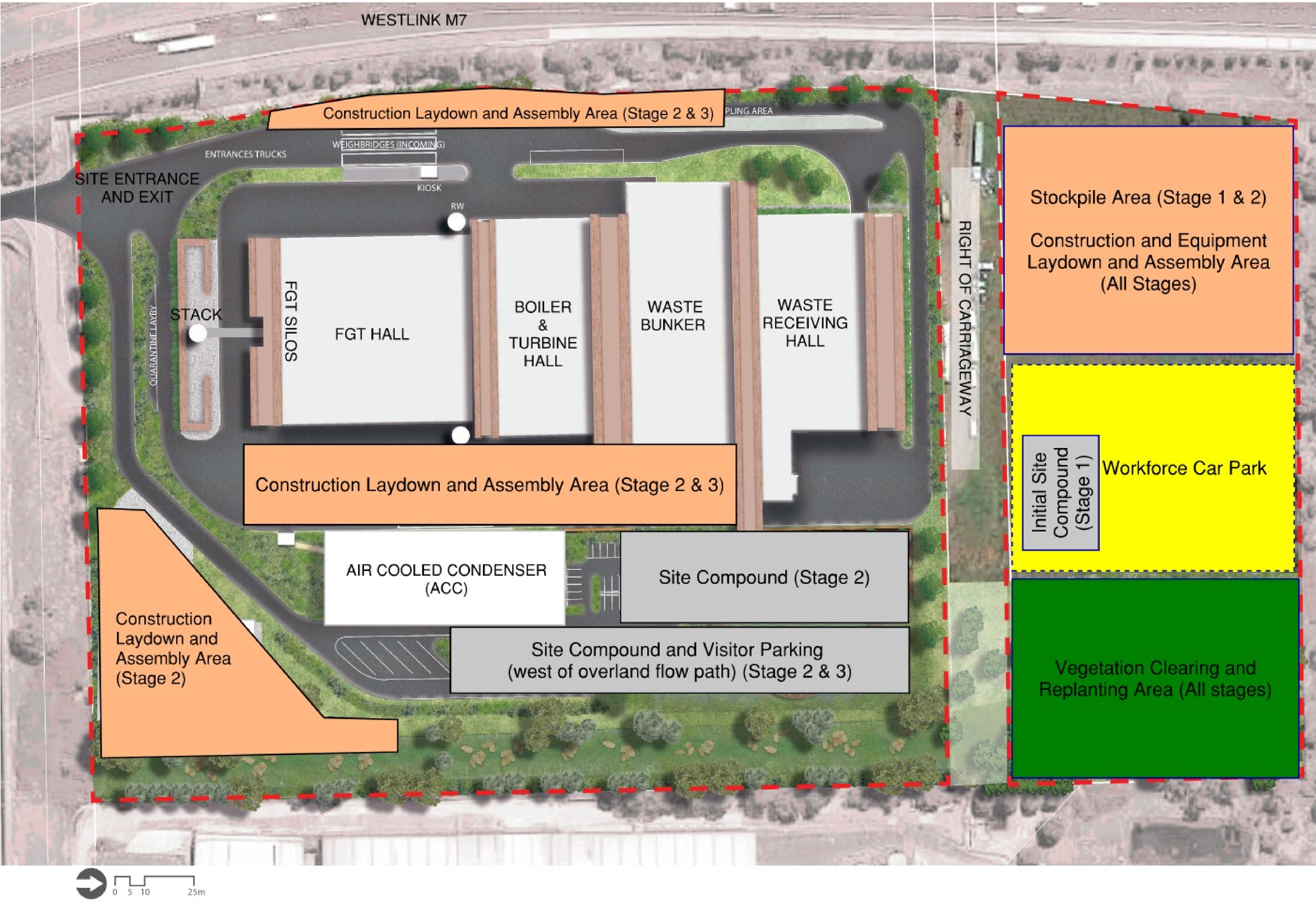


Figure 3.2: Indicative Construction Site Layout

3.3 Site layout and design

As shown in **Figure 1.3** of **Chapter 1 Introduction**, the proposal site of 8.23ha is split into two parts (a 2.04ha northern portion and a 6.19ha southern portion) divided by a small strip of land not part of the site but which includes a ‘right of carriageway’ that benefits the site. The WSERRC will be developed and fully contained on the southern 6.19ha portion. Works to occur on the 2.04ha northern section of the site include the clearing of weeds and exotic vegetation within the existing overland flow channel which is confined to the eastern section of this parcel of land. The northern section will also be used temporarily to support construction works. It is not currently expected that any other works will occur on the 2.04ha northern section of the site as part of this proposal.

Table 3.4 describes the key features of the site layout. The numbers within column 1 of **Table 3.4** correspond to the numbers within **Figure 3.3** for easy cross-reference.

Table 3.4: Site layout description

#	Key element	Description
1	Site entrance/exit	The site will be enclosed by a fence with perimeter control. All entrances to the site will have automated gates with video monitoring. All vehicles will enter via the gated entrance off Austral Bricks Road. A Waste Vehicle Inspection bay will be located adjacent to the weighbridges. On entry, two vehicle streams are created. Circulation around the site will be for heavy vehicles such as waste delivery trucks and residue collection trucks. The road to the visitor and education centre and parking will be for visitors and staff in light vehicles (cars, motorbikes) and for buses exclusively. This allows separation of site traffic and public/staff traffic. Pedestrian access will be installed adjacent to the vehicle access. Pavement will carry on through the site, taking pedestrians directly to the visitor and education centre safely separated from light or heavy vehicle traffic. Bike racks/sheds will also be installed on site to allow cyclists access to the site.
2	Incoming weighbridges	The incoming weighbridges will weigh the trucks on entry to monitor the tonnage of waste entering the facility. The weighbridge location has been selected to make sure that no queuing is required onto the Austral Bricks Road even at the busiest times of day.

#	Key element	Description
3	Truck decoupling and coupling area	The truck decoupling area allows the site to accept higher mass vehicles such as B-doubles. The B-double trailer would have to be decoupled in the designated area and tipped one section at a time. The site traffic design allows this to happen in a one-way system, thus not disrupting traffic flow around site.
4	Waste receiving hall	The waste receiving hall is part of the main EfW facility. Trucks will enter the enclosed receiving hall via fast moving roller shutter doors. The receiving hall will be kept under negative pressure to prevent odour escape and is where trucks unload waste directly into the waste bunker. Negative pressure will be achieved by drawing air from the tipping hall and bunker to the boiler (combustion air). For boiler downtime (for example in maintenance), an odour control system will be installed to prevent odour escape.
5	Bypass	This bypass allows vehicles for the collection of spent consumables and maintenance to bypass the waste receiving hall for safety.
6	Waste bunker	The bunker is used to temporarily store the waste feedstock, which would include overhead cranes to mix and load the process lines via the feed hopper. The bunker will have enough capacity to store up to a maximum 17,000t of waste feedstock on site at any one time. The bunker will have enough capacity to store between 5 and 7 days of waste, roughly 12,600t of waste feedstock onsite at any one time in normal operations. If there is a need for extended storage, for example due to a public holiday, the facility can close 50% of its tipping bays and thus store up to a theoretical maximum of 17,000t of waste onsite.
7	Boiler hall	Comprising the boiler plant for the combustion of waste.
8	Steam turbine hall and generator set	Comprising a steam turbine and generator to recover electricity from the steam.
9	Incinerator Bottom Ash (IBA) building	A drive through style IBA building will allow vehicles to collect the IBA, including a short-term storage of IBA and recovered metals onsite. The IBA building has been sized to store about 5 days' worth of IBA and metals, which is roughly 1,800t of IBA and about 250m^3 of recovered metals at any one time.
10	Flue Gas Treatment (FGT) hall and FGTr silos	Comprising the FGTr plant for treatment of flue gases. The FGTr silos are used to safely, securely and temporarily store FGTr before collection and transportation offsite for disposal at a licenced facility. The FGTr silos have been sized to store at least 6 days' worth of FGTr equivalent to about 360t of FGTr.

#	Key element	Description
		Vehicles will enter dedicated bays for the delivery of consumables and collection of FGTr, through an internalised vehicle corridor. Also included here will be FGT silos housing FGT consumables.
11	Outgoing weighbridges	Outgoing weighbridges will be used to monitor the amount of residue (for example ash and metals) taken offsite for treatment and disposal at external licenced facilities. Waste vehicles will be weighed on both arrival and departure and electronically catalogued.
12	Tank storage area	The tank storage area will be used to store tanks for auxiliary fuel. Auxiliary fuel is used for the auxiliary burners within the boilers and the emergency diesel generator. Ammonia and sodium hydroxide will also be stored in this area.
13	Stack	The stack will be about 75m high and will allow the cleaned flue gases to leave the facility and be fully dispersed to the atmosphere.
14	Parking	Staff parking and visitor parking is located within the segregated roadway adjacent to the visitor and education centre.
15	Visitor and education centre	The visitor and education centre is located on the eastern section of the site adjacent to the roadway for cars and buses. This location has been chosen so that pedestrians do not have to cross operational roads on site. A high-level enclosed walkway will be constructed for pedestrian passage to the main EfW facility. The visitor and education centre will allow tours and help educate and inform the community on the circular economy, recycling, resource recovery and EfW process.
16	Substation	To allow generated energy to be exported to the electricity grid.
17	Air Cooled Condenser (ACC)	To condense used steam back to water for reuse in the closed loop water/steam cycle.
18	Onsite detention (OSD) and bioretention basin	The OSD and bioretention basin are two interconnected basins. The western portion of the basin will act as a bioretention water quality basin which is landscaped depressions or shallow basins used to slow and treat onsite stormwater runoff. The eastern portion will act as an onsite detention (OSD) basin and include an outlet structure and emergency overflow spillway. Site stormwater runoff will be discharged from the OSD basin to the overland flow path.
-	Diesel generator and Uninterruptable Power Supply (UPS)	To allow emergency back-up power in case of failure of the electrical grid so the facility can react in a safe and controlled manner.

#	Key element	Description
-	Continuous Emissions Monitoring System (CEMS)	To continually monitor flue gases so the facility is compliant with statutory emissions limits as set out in this document. CEMS gives real time feedback to the facilities control systems enabling automatic control of emissions. Activities in the reception hall will also be monitored by operators in the control room directly. The control room will overlook the bunker to allow visual inspection.
-	Other ancillary equipment	Other ancillary equipment necessary to operate the facility, including utilities, civil works, drainage, water treatment and recycling plant, compressed air systems, fire safety equipment and small electrical and mechanical systems such as pumps, conveyors, cranes and instrumentation and controls.
-	Maintenance entrances	There are a variety of doors around the main building to allow access for maintenance vehicles.
-	Traffic control	A traffic control system will be installed onsite to safely control the flow of traffic both around site and for access to the tipping hall and each individual tipping bay.
-	Fencing	Fencing will be installed around the facility perimeter to secure the perimeter of the facility.
-	CCTV	CCTV will be installed at strategic locations throughout the facility and will be monitored for both safety and security of staff and visitors.

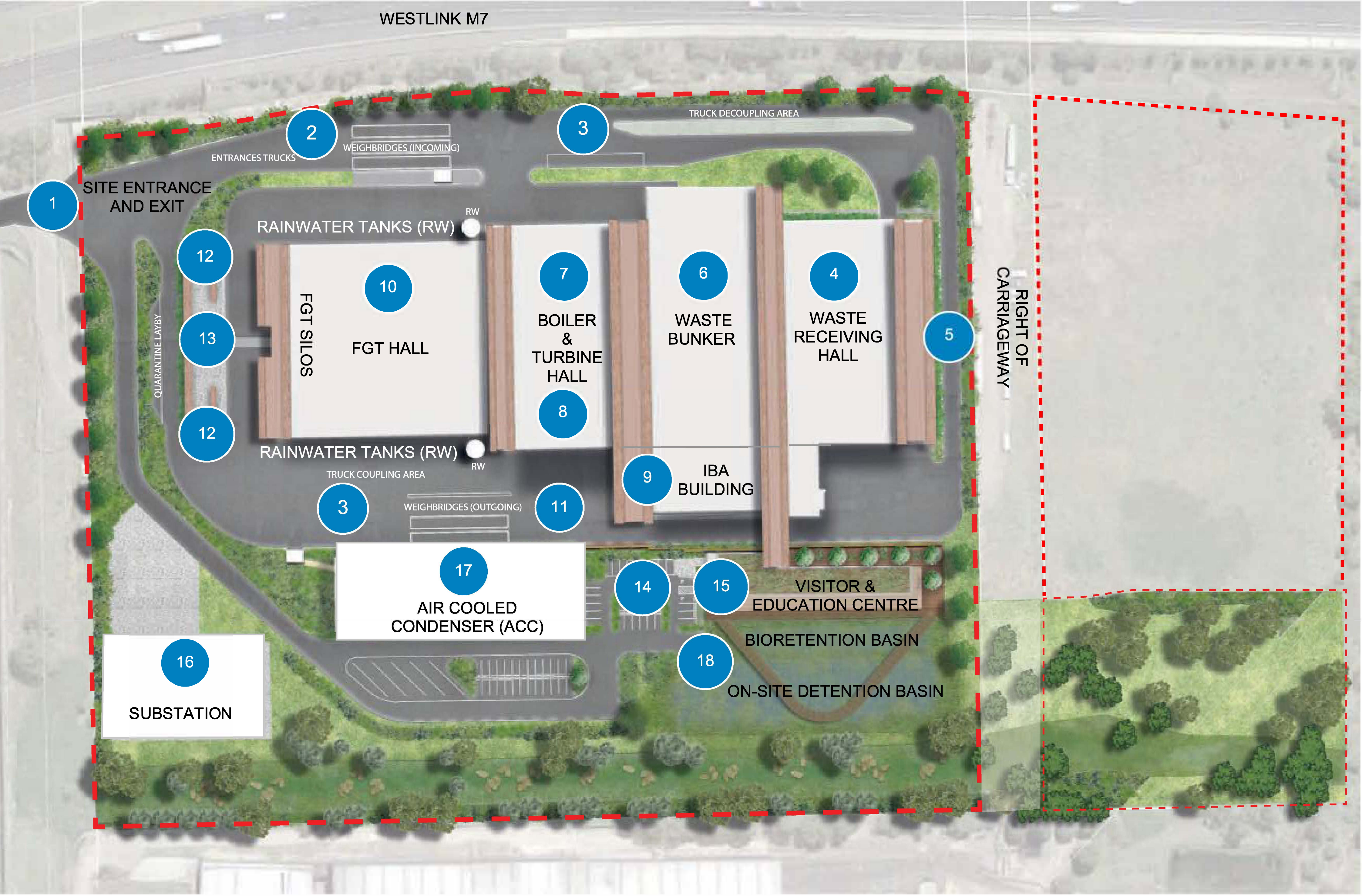


Figure 3.3: Proposed facility layout

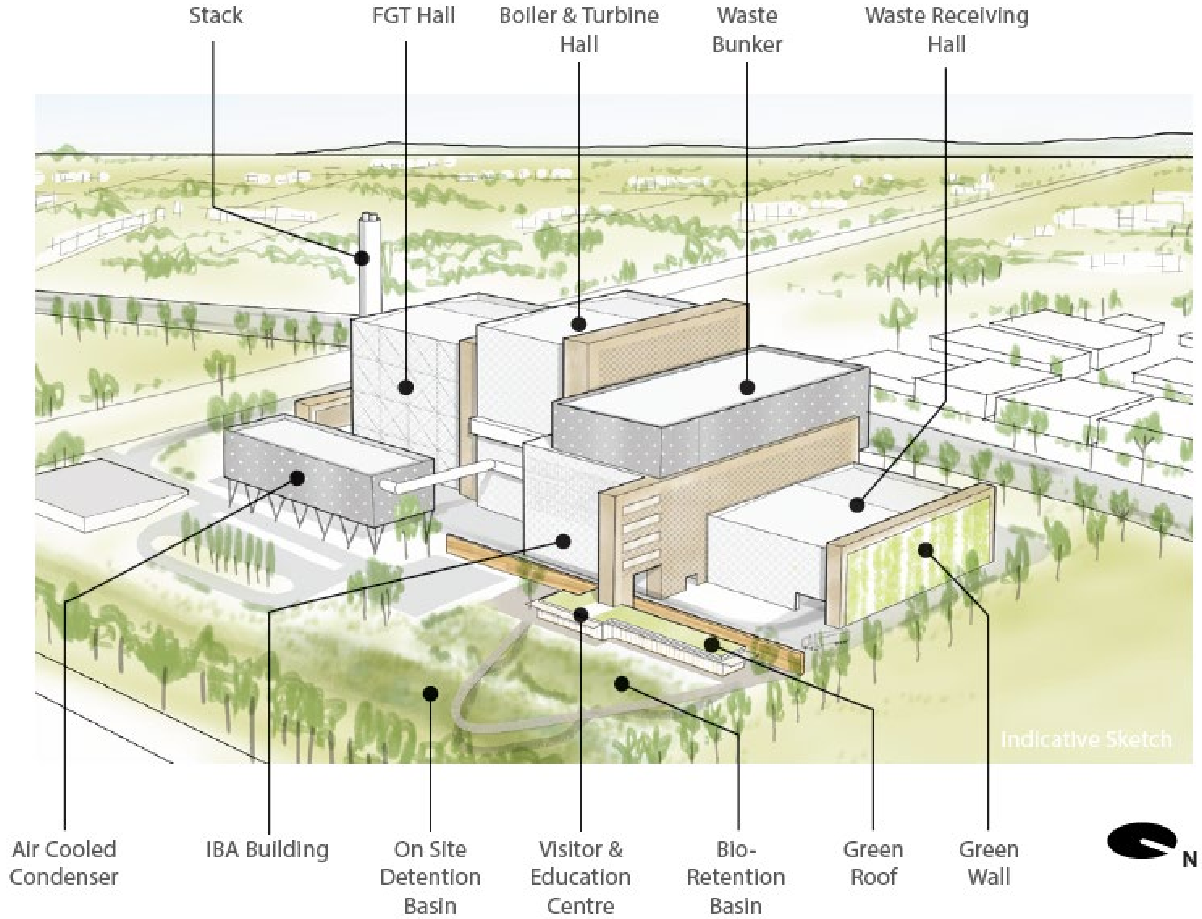


Figure 3.4: Indicative 3D facility dimensions

3.3.1 Approach to architecture and landscape design

One of the objectives of this proposal is to:

'Develop a facility which integrates the built form into the existing context, including adopting architecture which minimises visual bulk, and provides opportunities to enhance the appearance of the building'.

The approach to architecture and landscape design was driven by this objective of integrating the built form of the proposed facility into the local and district wide context, ensuring measures to mitigate the visual bulk of the building, and focus on the human experience for passers-by, employees and visitors.

The architectural design work completed to date represents the beginning of the design process and sets the direction for further refinement.

The architectural team has worked closely with the wider technical specialists to understand the technical parameters of the facility so that these operational requirements of the facility are fully integrated into the overall design.

The design responds to the SEARs and has been influenced through engagement with stakeholders such as Blacktown City Council (BCC) and Western Sydney Parklands Trust (WSPT). Following feedback from the Western Sydney Parklands Trust, the design also enables the continuation of green areas through the site.

Initially, four main design aspirations were identified and described which set the priorities for the design outcome. All design refinements are driven by and critiqued against these aspirations to make sure they are in alignment. The design aspirations are as follows:

1. Embrace innovation:

- Lead the way in the use of world-class sustainable technologies
- Become a catalyst for high-quality design and innovation in Western Sydney
- Promote a circular economy
- Create an exemplar facility.

2. Integrate with the context:

- Positively contribute to and integrate with existing and the emerging local character of the area
- Ground the building into the unique local context
- Shape the built form to mitigate visual effect
- Select materials which complement and align with the local environment.

3. Invigorate the wider ecosystem:

- Benefit the local ecosystem and microclimate
- Responsibly manage the site through the handling of stormwater and the reuse of collected rainwater
- Focus the landscape planting strategy around the use of native trees and shrubs to reinvigorate native biodiversity.

4. Provide a generous human interface:

- Be honest and transparent about the purpose of the facility
- Carefully consider the buildings appearance from main public viewing points
- Offer an excellent visitor experience to educate and inspire.

The aspirations are addressed through the design of the building’s orientation, form, massing, perceived bulk, façade articulation, materials selection and the integrated landscape design approach. The experience of passers-by, visitors and employees has been carefully analysed to develop an informed and considered design outcome.

Based on the above aspirations and site constraints, the building footprint is designed to be consolidated within the southern section of the site, clustering smaller buildings into one area to limit sprawl, while decreasing height towards the north and south extents of the site to minimise negative visual as.

The physical bulk of the building was broken down by using vertical blades. The use of the ‘blades’ interrupts the large façades, so they are more visually interesting and less bulky as well as breaking up the mass from main viewing corridors on the M7 in the north and south directions. To further soften the building’s appearance from the road and connect it to the landscape, the northern and southern ends of the building will be covered in living green walls, to help blend it into the vegetated backdrop. The landscape design also includes screening around the perimeter of the site to block direct views and increase density of roadside vegetation. The design tightly wraps the building, eliminating any wasted space. Once the building is subdivided in this manner, the facades in between the blades will be clad in materials to break up mass.

The areas in-between the blades are to be clad in materials which become increasingly transparent as you move along the building. This expression follows the internal process, supporting the WSERRC’s function as an educational resource. To support the circular economy aspiration, material selection will incorporate renewable or recovered materials where possible.

An EfW facility allows baseload power and is not intended to be set up as a modular design. However, there are elements of modularity associated with the WSERRC proposal.

For example, the proposal uses two boiler lines and so is flexible in being able to operate a single boiler line at a time or both boiler lines together. Additionally, the facility can operate between 70% and 100% of full thermal load which give additional flexibility to operations.

3.3.2 Civil and structural considerations

Civil and structural elements will be fully detailed in the design stage. The main civil and structural elements under thought are:

- Main EfW building housing all process plant and equipment and administration/office space
- Visitor and education centre
- Substation
- Utilities connections (water, power, telecommunications, wastewater)
- Waste bunker
- Stormwater drainage
- Foundation design including stack
- Earthworks and suitability of existing soils/rock for reuse.

Additional considerations that have been made for this proposal include the allowance of ancillary items such as:

- Tanks and suitable bunds
- Roads and hard standing
- Fencing, gates, kiosks and security
- Landscaping.

It is noted that works relating to the main road access and crossing of Warragamba pipelines are considered related development (refer to **Chapter 22 Related development**).

3.3.3 Next steps in the design process

Design process will be further developed in the detailed design. The community will be consulted in the detailed design phase of the proposal by setting up the WSERRC Community Reference Group (CRG). It is envisioned that the CRG will give feedback and input into features of the visitor and education centre, aspects of the green wall and landscaping, and, where possible, final materials selection. Wider community engagement will be encouraged where appropriate – for example, in selecting a local artist to contribute to specific design elements.

3.4 Operation

The following section describes the day-to-day operational characteristics of the EfW facility.

3.4.1 Waste Feedstock

The WSERRC will thermally treat both residual MSW and C&I waste, that meet the requirements of the waste acceptance protocol as described in **Chapter 5 EfW Policy**. The facility will not receive Construction and Demolition (C&D) waste. MSW is household red bin waste whereas C&I waste comes from a variety of commercial and industrial sources, including offices, schools, shopping centres, warehouses and manufacturing. MSW and C&I waste streams are similar in composition. Further detail on the composition of MSW and C&I, what constitutes residual waste and the types of wastes which the facility will not accept is provided in **Chapter 5 EfW Policy** and **Technical Report C – Waste Management** of this EIS.

Figure 3.5 and **Figure 3.6** show images of samples of MSW and C&I wastes respectively, taken at Cleanaway's existing Erskine Park Waste Transfer Station.

Figure 3.5: Sample image of MSW

Figure 3.6: Sample image of C&I waste

3.4.2 Key technical parameters

Table 3.5 shows an overview of the key technical parameters for the operation of the proposed facility.

Table 3.5: Key technical parameters

Parameter	Unit	Value/Description
Annual throughput of waste	t	500,000
Maximum hourly throughput of waste	t	37.5 per boiler line (75 total)
Target annual facility availability	t	≥ 8,000
Guaranteed electrical efficiency	%	≥ 25% (for compliance with NSW EfW Policy Statement)
Expected electrical efficiency (gross)[5]	%	30.5%
Expected electrical efficiency (net)[5]	%	27.8%
Expected facility R1 efficiency[6]	%	81%
Gross electricity generated	MW	Roughly 58

[5] Electrical efficiency (gross and net) will be confirmed in detailed design, so expected values may change. WSERRC will however be compliant with the needed electrical efficiency of greater than 25% as set out in the NSW EfW Policy Statement in all cases.

[6] The facility R1 efficiency is a factor set out by the European Union to help recognise whether a facility is characterised as incineration or recovery. Recovery is the desired status, which WSERRC will achieve. To classify as recovery, the facility must have an R1 efficiency of equal to or greater than 65%. 81% is indicative and will depend on the detailed design.

Parameter	Unit	Value/Description
Wastes treated	#	Residual Municipal Solid Waste (MSW) and Commercial and Industrial (C&I) waste
Calorific value of waste for design	MJ/kg	11.0
Calorific value design range	MJ/kg	7.70 to 14.30
Emissions limits	#	See **Technical report A Air Quality and Odour Assessment Report**
Expected IBA quantity per annum (wet)	t	80,000
Expected FGTr quantity per annum (dry)	t	20,000
Expected boiler fly ash quantities	t	Incorporated into the IBA and FGTr tonnages above.

3.4.3 Throughput

The facility will have a normal operational throughput of up to 500,000tpa of waste, providing about 58MW of electricity per year on a gross basis. A throughput of up to 500,000tpa necessitates the use of two boilers, each boiler having an annual throughput of 250,000t. This is known as having two boiler lines. Each line will have its own dedicated feed hopper, boiler and flue gas treatment. However, the stack and steam turbine will be common to each line meaning there is only a single stack (with two separated flues) and a single steam turbine servicing the facility. The waste bunker, ash system and crane system will also be common and service the entire facility.

The composition of waste feedstock is variable compared to traditional fuels such as coal and gas. Waste composition audits of target MSW and C&I waste streams have been carried out to understand the calorific value, or energy content, of the waste feedstock and the variability over time.

This has allowed a calorific value to be nominated as the design point for the facility with the thermal treatment technology capable of managing variation in the energy content either side of this design point.

An EfW facility must be designed to operate based on such variations in calorific value. For this reason, each EfW facility is designed using a firing diagram as shown in **Figure 3.7**. The firing diagram sets out the range of calorific values over which a facility can operate.

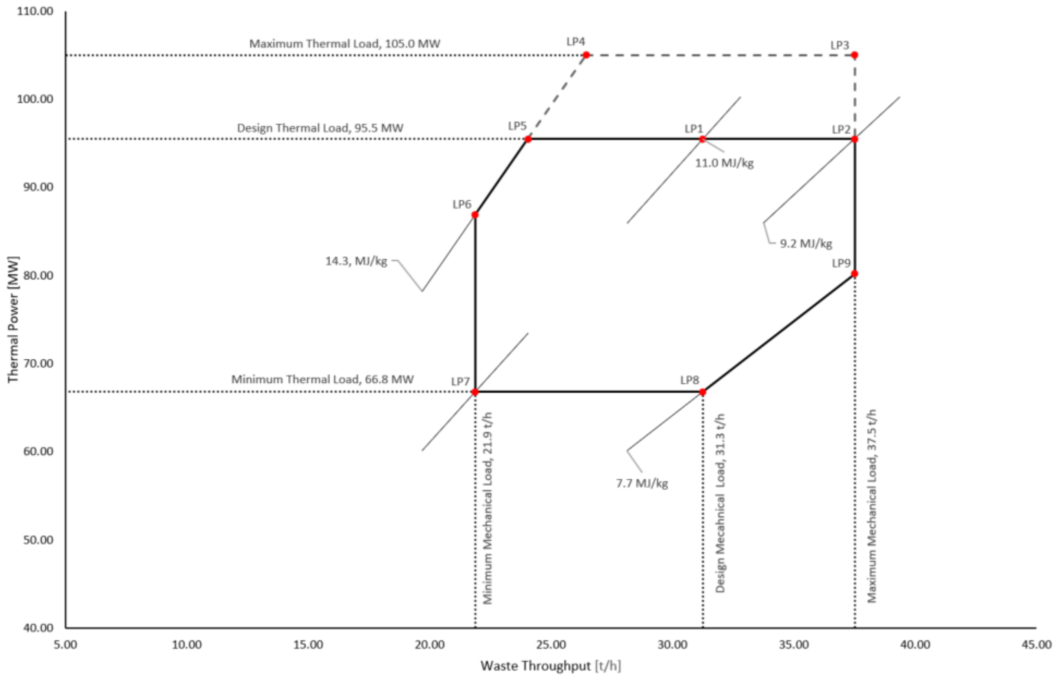


Figure 3.7: Firing diagram

The firing diagram is identical for both boilers. Note that **Figure 3.7** displays the firing diagram for one boiler only.

WSERRC is designed to operate in the region of 8,000 hours per year. It cannot operate all the time (8,760 hours per year) as it needs to be taken offline around twice per year for scheduled maintenance. The design point for the facility is a calorific value of 11MJ/kg, shown by point LP1 in **Figure 3.7**. This is based on analysis of the waste streams (both MSW and C&I) currently received at the Erskine Park Waste Transfer Station. To achieve an electrical gross output of 58MW, the facility must maintain a constant thermal input of 95.5MWth per boiler. The facility aims to achieve a constant boiler load of 100%, hence the amount (mass) of waste loaded into the boiler on an hourly basis can change (via automatic combustion control) as calorific value varies.

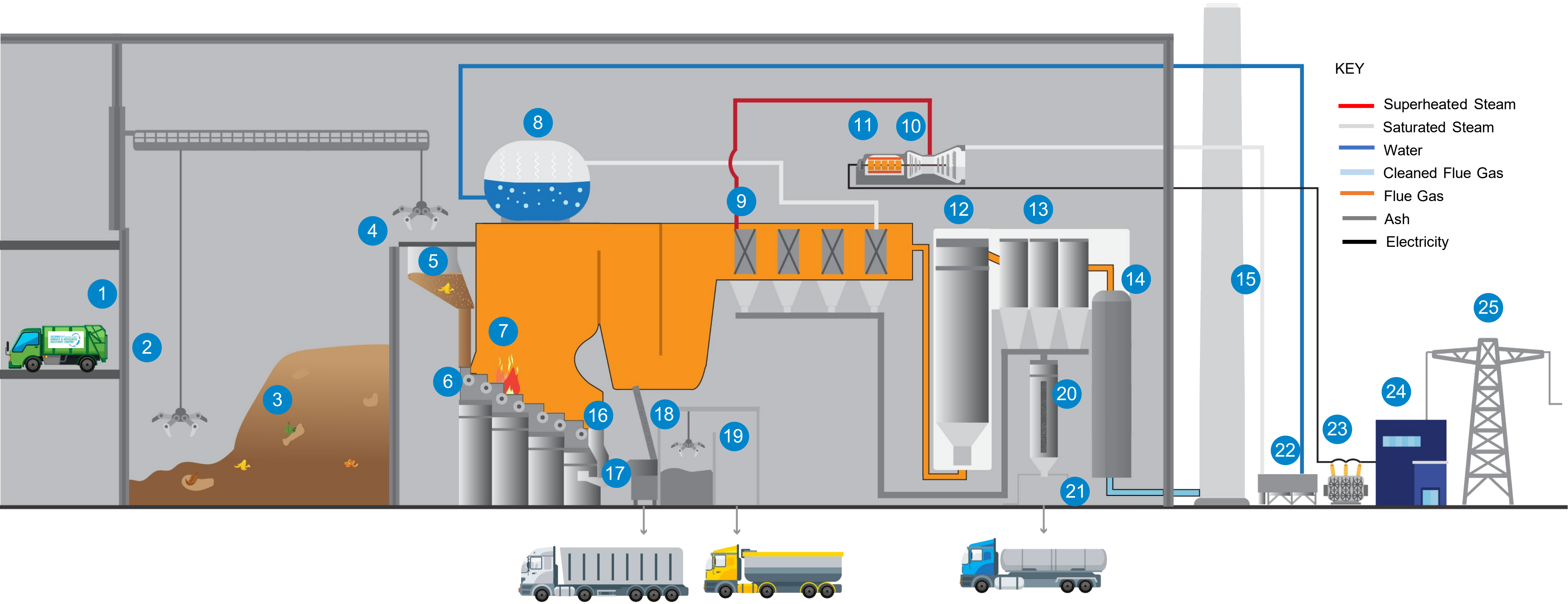
For example, at the design point of 11MJ/kg (LP1), the facility will consume 31.3tph of waste per line which equates to 500,000t of waste (250,000t per line). To achieve 100% boiler load the facility can safely treat waste with a range of calorific values between 9.2MJ/kg and 14.3MJ/kg which have an equivalent mass of between 37.5tph and 24.0tph respectively (LP5 – LP2).

To deal with short-term fluctuations in waste calorific value, the facility has been designed to also accommodate a boiler load of between 70% and 110% of the design boiler load. This is illustrated by the extreme points on the firing diagram (LP7, LP3).

The EfW facility is expected to process 500,000tpa of waste (LP1) per annum. However, within the absolute technical limits of the firing diagram, to allow for short term variation in waste calorific value the minimum volume of waste that could be combusted is 21.9tph, equating to a theoretical minimum of 175,200tpa (operating on one boiler line, LP6 and LP7). To allow for short term fluctuation in the calorific value of the waste, the maximum volume of waste that could be combusted is 75tph (both boiler lines operating at lower than design calorific value, LP2, LP3 and LP9) however the project still commits to a maximum throughput of 500,000tpa. This EIS has considered operation of the facility from an environmental perspective within all possible operating parameters. Approval is sought for a maximum annual throughput for the facility of 500,000t, reflecting the design point of the system.

3.4.4 Process flow

A schematic process diagram of the facility, depicting the main steps in the EfW process from receival of waste through to FGT and residue management is shown in **Figure 3.8**. The main steps in the EfW process for the proposal are further discussed in the following sections.



LEGEND

1	Waste Receiving hall	7	Boiler	13	Bag filters	20	Flue gas treatment residues (FGTr) and boiler fly ash silo
2	Tipping bay	8	Steam drum	14	Wet scrubber	21	FGTr and boiler fly ash collection for treatment and disposal
3	Waste bunker	9	Superheaters	15	Stack	22	Air cooled condenser
4	Waste crane	10	Steam turbine	16	Incinerator bottom ash (IBA) handling	23	Transformer
5	Feed hopper (chute)	11	Generator	17	Ferrous metals recovery	24	Substation
6	Moving grate	12	Semi dry reactor	18	IBA bunker and separate metals bunker	25	Local electricity grid
				19	IBA collection and separate metals collection		

Figure 3.8: Schematic of the EfW operational process

3.4.5 Energy Balance

Figure 3.9 shows the indicative energy balance for WSERRC. The case shown is the design case, point LP1 on the firing diagram provided in **Figure 3.7**. The values provided in the mass and energy balance will be optimised and confirmed during the detailed design process therefore may vary slightly. Design values have been provided here to show that the facility's energy efficiency significantly exceeds that required by the NSW EfW Policy Statement (25% efficiency criteria and an R1 factor of greater than 0.65), although these figures will be confirmed during detailed design, WSERRC commits to meet or exceed the efficiency requirements under the NSW EfW Policy Statement in all cases.

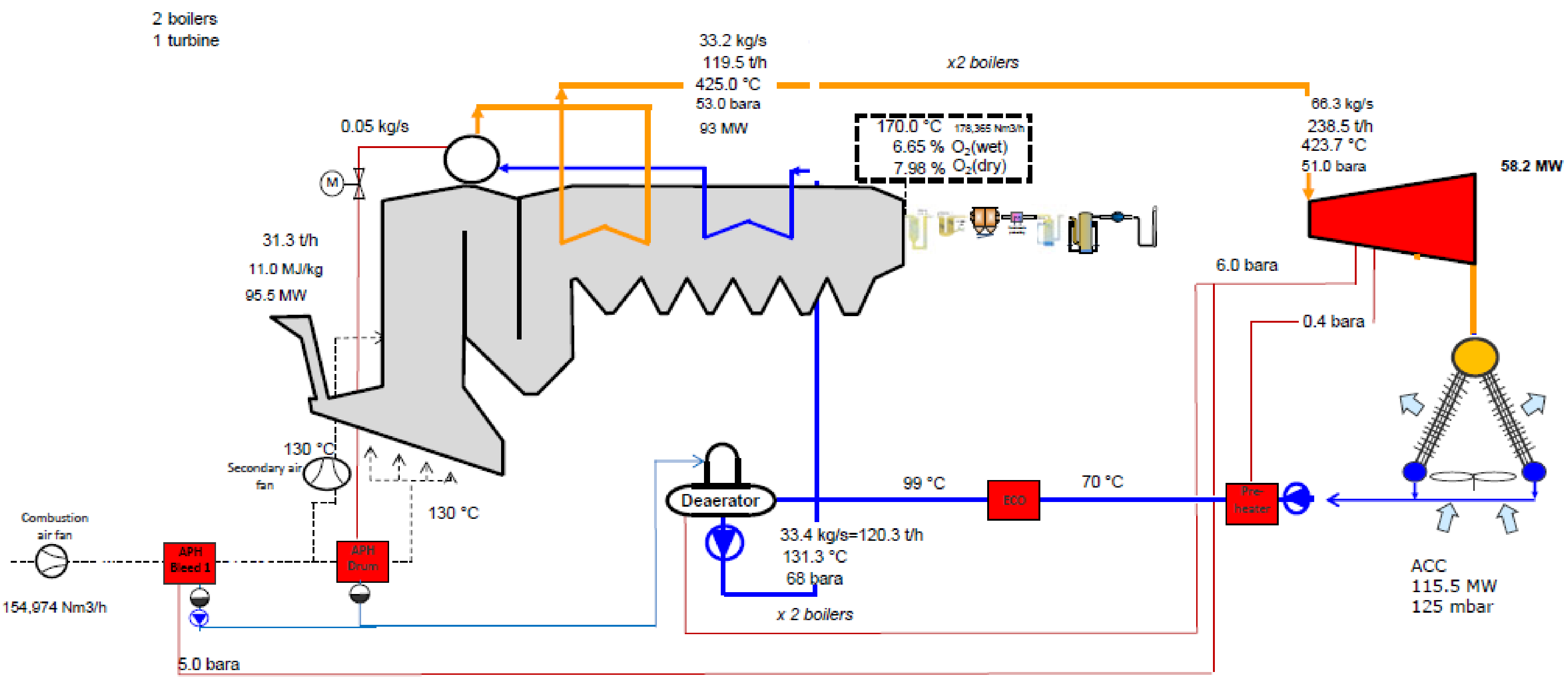


Figure 3.9: Indicative WSERRC energy balance

Note 1 – The figures for a single boiler are shown prior to the turbine. The proposal includes two boilers.

3.4.6 Waste deliveries

Waste will be delivered to the site in enclosed waste delivery vehicles. The route taken to site will depend on the origin of the waste, however all vehicles would enter the site via Wallgrove Road.

WSERRC will include clear traffic signage and signage at the site entrance to identify wastes that can and cannot be accepted at the facility e.g. no asbestos, no hazardous waste, etc.

The vehicles will be weighed via the weighbridge on arrival and electronically catalogued. The weighbridges will be equipped with CCTV, card reader, licence plate scanner and intercom equipment. Weighbridges have been located inside the site at a position that gives sufficient queuing space onsite to manage the peak volume of vehicles expected to arrive on site during any one-hour period. All ingoing and outgoing traffic will be registered by automated licence plate recognition and linked to the truck management system. Trucks regularly visiting the facility can be pre-registered via the management system.

Radiation detection will be installed which will detect radioactive materials and prevent their thermal treatment at the facility. The radiation detection system will trigger an alarm if the level of radiation is 5 standard deviations above background radiation levels. This threshold will be tested and adjusted, if necessary, during commissioning to maintain proper operation. If a radiation alarm is raised, the vehicle will be directed to quarantine for inspection and assessment. A portable survey meter will be used to inspect the load. If a load is found to contain a source of radiation, that load will be rejected and will remain the responsibility of the supplier for proper disposal at a suitably licensed facility.

Once registered in the truck management system, the waste delivery trucks will be allocated to a dedicated tipping bay and will be directed to the tipping hall.

All waste deliveries will come from approved suppliers. This means that all suppliers will have to pre-qualify before they can enter the site. Pre-qualification will include steps so that the waste being delivered:

- Is an acceptable waste stream
- Is suitable for combustion within the facility
- Complies with licence and legislation conditions.

There will be no acceptance of waste at the site from suppliers that have not been through the prequalification process. The prequalification process can be found in **section 5.8** of **Chapter 5 EfW Policy**.

3.4.7 Waste receival

The tipping hall is located on ground level and arranged for unidirectional traffic. Enclosed waste delivery trucks will drive into the waste receiving hall, through fast-acting roller shutter doors, located on the southern elevation of the building.

The waste receiving hall will be kept under negative pressure to prevent odour escape. Negative pressure will be achieved by drawing air from the tipping hall and bunker to the boiler (combustion air). Waste delivery trucks will reverse into the assigned tipping bay. Protection will be given so that delivery trucks do not fall into the waste bunker while tipping.

Waste will be unloaded using either a tipper type or walking floor type trailer into chutes which convey the waste to the storage bunker. The number of tipping bays will be optimised for efficient and convenient turnaround time for delivery trucks in peak hours.

Empty vehicles would exit the receival hall, circulate around the site and exit over the outbound weighbridge back onto the unnamed road.

The facility has been designed to accept waste deliveries from:

- Compactor type vehicles
- Semi-trailer type vehicles
- B-doubles.

The facility can accept walking floor type vehicles or tipping type vehicles.

The design of the weighbridge and tipping hall configuration has been optimised based on the traffic scenario which is described further in **Technical report K Traffic and Transport Assessment** of this EIS.

3.4.8 Waste inspection, quarantine and rejection procedures

The EfW facility will apply procedures for the inspection, quarantine and rejection of unacceptable waste which will include:

- Radiation detection equipment at each of the weighbridges.
- A Waste Vehicle Inspection bay to be located adjacent to the weighbridges. This will be used to divert any vehicle for temporary holding. This will allow a site representative to conduct a close visual inspection of the chain of custody documentation. The waste itself cannot be inspected in this area as it will be housed within an enclosed waste vehicle.
- If there are obvious inconsistencies in the paperwork or other problems noted by facility personnel, the load will be immediately rejected and returned to the supplier.

- If an inspection of the waste itself is needed, there is a dedicated area within the waste receiving hall where the waste can be segregated and tipped on to the floor for inspection. Samples can also be taken for laboratory testing if required. If the waste is found to be unacceptable, it will be reloaded into the truck using a front-end loader and rejected from site and returned to the supplier. If the waste is found to be compliant, it can be loaded into the bunker by the front loader.
- If an unacceptable waste item of sufficient size is identified in the waste bunker by the crane operator (for example a large metal component), the operator can use the crane to pick the item out and deliver it to the segregated quarantine area for further inspection and removal from site if appropriate. Acceptable waste that is oversized can be picked out and shredded in the shredder located adjacent to the bunker. Shredded waste is placed back into the bunker.

In addition to the procedures on site to control the quality of waste combusted in the facility, the pre-qualification procedure will reduce the risk of delivery of unacceptable waste to the site.

3.4.9 Waste storage

Waste feedstock will be temporarily stored in the waste bunker. The bunker will have enough capacity to store about five to seven days' throughput of waste over normal operations.

Cranes will be positioned above the bunker and used for:

- Mixing and distribution of waste within the bunker
- Feeding waste into the boiler feed hopper
- Extracting any items of waste that are out of specification or oversized. Oversized material will be processed in a shredder adjacent to the bunker and fed back into the bunker after shredding.

Crane parking bays will be located inside the facility, adjacent to the bunker and will be used for maintenance of the cranes.

Activities in the waste receiving hall will be monitored by operators in the control room directly. The control room will overlook the bunker to allow visual inspection. Waste will be fed by the waste cranes into the feed hopper.
The purpose of the feed hopper is to control the delivery of waste into the boiler. Each boiler will have its own dedicated feed hopper with each waste crane able to feed each hopper.

The facility is designed to operate two boiler lines. If one is down for maintenance, the other can continue to process waste. The facility has enough redundancy that in most circumstances a single boiler could be used safely to combust waste left in the bunker. The exception to this is maintenance of the turbine or an unexpected shutdown of the entire facility. Odour will be controlled using a dedicated odour filtration system. If there is an unforeseen shutdown, the facility would take steps so that waste is not held in the bunker for an extended period, including:

- Spare parts will be stored on site to minimise downtime from breakdowns.
- In the worst case, if the facility must be offline for an extended period, the facility is designed to be able to empty the bunker of waste using the crane to load vehicles and be removed offsite and disposed of safely to a licenced facility and in line with legislation.

In all scenarios, the facility can always manage odour and waste.

All waste receival and waste storage areas will be impermeable (including flooring and bunker). The waste itself is not liquid but will have a moisture content. Any moisture run-off (which is expected to be minimal) will be absorbed back into the waste itself and fed through the boilers thus a dedicated leachate system is not required. Any sweepings through cleaning of the tipping hall floor, including any run-off from vehicles (such as rainwater deposited on the tipping hall floor) will be swept into the waste bunker to be thermally treated.

3.4.9.1 Waste Mixing

The waste bunker is used for receiving, mixing and temporary storage of waste until the waste is fed to the waste hopper. The size and shape of the bunker has been refined to allow for these activities to be managed successfully. As such, enough space has been provided to allow for a dedicated mixing zone, and the capacity of the waste cranes have been designed to allow for effective mixing.

Waste is a non-homogenous fuel by nature and the process of mixing in the waste bunker is designed so the waste is as homogenous as reasonably practicable when it is combusted. This process seeks to avoid significant variation in the properties of waste and thus the properties of combustion of the waste. In most facilities globally, including the reference facilities, waste is mixed using the waste crane.

When the waste is tipped, it is deposited into the front of the waste bunker into a channel that is made by moving and stacking tipped waste. After the waste falls into the channel, it is moved towards the rear of the waste bunker by the crane into the stacking and mixing position.

The waste will be mixed either by spreading the waste in the grab over a large area by slowly releasing the grab as it moves across the waste pile (when the waste level is flat) or by dropping the waste on the parts of the waste that is stacked at an angle (typically 60 degrees) causing the waste to slide and mix with the waste already in that position. This process will occur several times before being fed to the boiler feed hopper in order to make sure proper mixing has been carried out. Only once properly mixed will the waste be deposited into the waste hopper.

The facility will include at least two cranes, to allow receiving, stacking, mixing and feeding to occur simultaneously. Overall, approximately 66% of the time the waste cranes will be dedicated to stacking, mixing and receiving with the remaining time for feeding. Computer control systems can be used to effectively section the waste bunker and undertake crane operations appropriately so waste is mixed.

Although the cranes can operate automatically, trained operators will be able to implement manual control. Operators will be trained to visually assess the waste bunker and incoming waste to understand how best to operate the cranes and achieve optimal mixing. This is typical for facilities globally, including the reference facilities.

3.4.10 Combustion

Waste is fed from the feed hopper to the combustion grate at a variable rate, depending on the calorific value of the waste. The grate will employ advanced moving grate technology which is the most commonly used technology for the thermal treatment of municipal solid waste.

Waste combustion will take place as it slowly moves along the grate which slopes away from the waste feed chute. The movement of the grate floor components and the slope of the grate will cause the waste, as it burns, to move forward and downwards from the feed point to the ash discharge point. Movement of the grate floor components will also agitate the waste so that new surfaces will be continuously exposed to the flames. The rate at which the waste moves will be controlled to optimise combustion. Typically waste takes about 90 minutes to fully combust.

Waste combustion would be automatically controlled via the facility Distributed Control System (DCS) utilising the advanced combustion control systems and feedback from the CEMS.

3.4.11 Boilers, superheaters and economisers

Figure 3.10 shows the main components of a waste boiler system.

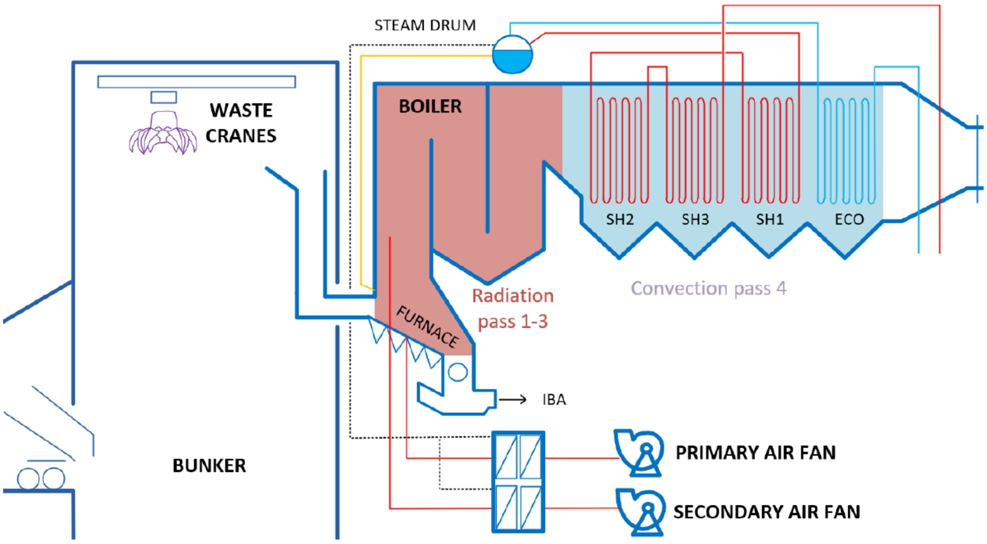


Figure 3.10: Waste boiler system

In the boiler, heat from the combustion of waste is transferred to the feedwater to generate steam. Combustion gases will be held at a minimum temperature of 850°C for at least 2 seconds to comply with the conditions set out in the NSW EfW policy and IED. A series of boiler sections, including several superheater bundles and an economiser pass, which are used to transfer heat at varying temperatures, will enable efficient transfer of heat between the combustion gases and the feedwater. Safety in design in detailed design will consider enough levels of insulation and separation to protect operators working near the boiler. Additionally, the design will consider suitable fire safety practices such that compliance with NSW fire regulations is achieved.

Steam will flow from the boiler section to the steam turbine. The steam will be superheated and will be of sufficient quality (suitable temperature and pressure) for use in the steam turbine without damage to the turbine. Given the high temperature and pressure environment, the steam system will be equipped with appropriate safety features such as temperature gauges, pressure gauges, level gauges and pressure relief valves. The DCS will be able to control and shut down the facility in case of emergency depending on set limits. It will also include the capability for manual intervention for emergency shutdown.

Within the furnace of each boiler, auxiliary burners will be installed for start-up of the boiler and temperature control in the case of receiving low calorific value waste, to enable continuous compliance with the temperature limits set out in the NSW EfW Policy and IED.

Auxiliary burners will use liquid fuel (diesel) that will be stored in bunded tanks on site, the same process that is used at the Dublin reference facility. The auxiliary burners specified will be low NO_x and will be suitably designed within practicable means to minimise air emissions. The flue gases generated by the diesel burners will pass through the waste boiler FGT system which will be operational (except for the SNCR system during start-up). The purpose of the burners is to heat the flue gases to 850°C, the point at which the SNCR system can function. Therefore, low NO_x burners coupled with the boiler FGT system and DCS minimises the air emissions during start up and shut down as far as practicable. Additionally, during shut down the SNCR system will be operational, further reducing NO_x emissions from the diesel burners. All cleaned flue gases from the diesel burners will be discharged from the stack.

The boilers will be cleaned offline in the annual maintenance shutdown. Mechanical rapping systems will be included alongside a water shower for online cleaning.

3.4.12 Steam turbine and air-cooled condenser

A modern, high-efficiency condensing type steam turbine will be installed to generate electricity using steam from each boiler. The steam turbine will service both boilers. Conversion of energy contained within the steam to electrical energy is allowed by a generator. The EfW facility is designed to generate about 58MW of electricity on a gross basis. Some of the electricity generated by the turbine will be used to power the facility itself (known as parasitic load). This is expected to be in the range of 3MW to 5MW of electricity, which means that the facility is designed to output between 53MW and 55MW of electricity to the electricity grid.

The proposal will comply with the NSW EfW policy and achieve a gross electrical efficiency of greater than 25% (note that if heat is recovered as part of the EfW process in the future, the proposal will meet an equivalent level of recovery for facilities generating Combined Heat and Power). The proposal is expected to achieve an electrical efficiency significantly greater than the minimum 25% as outlined in **Table 3.5**, subject to finalisation in detailed design by the equipment supplier.

If the turbine is not operating, for example due to facility start-up or shutdown for maintenance, electricity can be imported from the electricity grid. This is needed to make sure safe start-up and shutdown procedures are followed.

In the unlikely event of failure of the electricity grid, an Uninterruptable Power Supply (UPS) and emergency onsite diesel generator will operate to allow electricity to the facility so that critical safety and control systems remain online, and that the facility can be safely shut down (from both an environmental and personnel safety perspective). The diesel generator will only be operated in an emergency or for testing purposes and will likely only operate for c. 25 hours per year (for testing). The diesel generator will meet the requirements outlined in the NSW POEO legislation. To achieve this, the diesel generator will use a two-stage catalyst, an oxidation catalyst followed by a particle catalyst as is typical for emergency diesel generators installed in NSW. In the case of a power outage where the turbine was unable to continue to operate, the generator will start up and power the facility until a shutdown has been achieved. This shutdown process will take approximately 1 to 1.5 hours. The generator will be started periodically (typically once a week) for testing for a period of 15 to 30 minutes.

Steam will exit the turbine at low temperature and low pressure and condensed to generate feedwater that can then be recycled and reused in the boilers. To condense steam to a useable feedwater, the facility will incorporate an Air-Cooled Condenser (ACC). Use of an ACC is standard operation within many power plants globally and allows water within the steam cycle to be reused.

3.4.13 Combined Heat and Power (CHP)

The WSERRC is designed to be capable of operating either in electricity-only mode or combined heat and power mode.

- Electricity-only mode means that the turbine operates such that only electricity is produced.
- Combined Heat and Power model means that the turbine operates such that heat is extracted at the expense of electricity to be used as process heating.

The WSERRC is described as CHP ready. The facility will primarily operate in electricity-only mode. However, a turbine connection for a future heat offtake will be installed. This is beneficial as it allows the facility to be flexible to future potential changes in energy demand. While the proposal has no immediate plans to operate in a CHP scenario, there is possibility in the future that steam could be used in the nearby industrial areas for direct process use or for absorption cooling.

The construction works associated with any future heat network connection is not part of this application and would be dealt with under a separate application, should the need arise.

3.4.14 Flue Gas Treatment

Combustion gases created through the combustion of waste must be cleaned before released from the stack. This section gives an overview of the treatment systems employed. Further technical detail can be found in **Technical report D Best Available Techniques Assessment Report**.

This facility will be capable of cleaning the flue gases in line with the emissions limits as set out in the Industrial Emissions Directive (IED) and the associated Best Available Techniques Reference (BREF) document for waste incineration as published on 3 December 2019.

Emission Limit Values (ELVs) have not been duplicated in this section of the EIS, these can be found in **Technical report A Air Quality and Odour Assessment Report**. This chapter only gives an overview of the cleaning systems proposed.

An overview of the proposed treatment system for the facility is in **Figure 3.11**

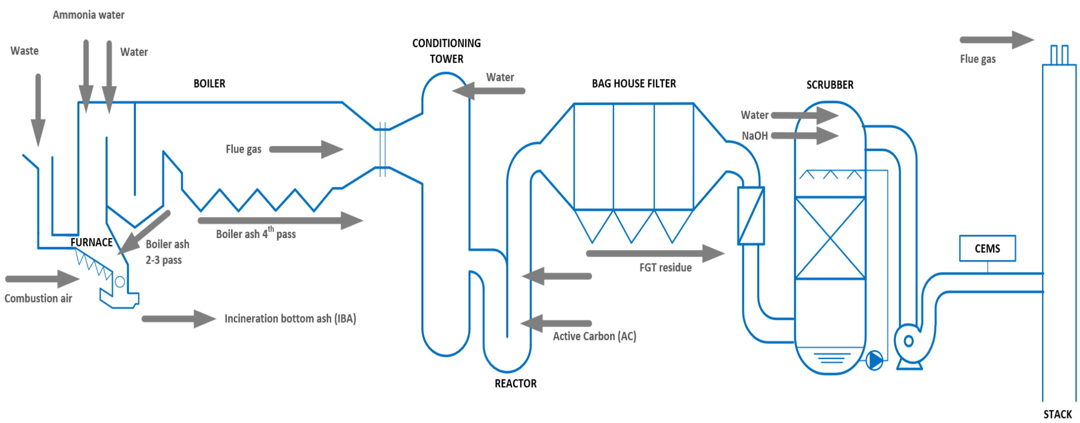


Figure 3.11: Proposed treatment system

The key components of the FGT system and the purpose of each of the components are outlined in **Table 3.6** below.

Table 3.6: Key components of the flue gas treatment system

#	Function	Description
1	Selective Non-Catalytic Reduction (SNCR)	SNCR is the technology that has been chosen for the reduction of oxides of nitrogen (NO_x) within the flue gases. Ammonia is injected into the flue gas path and reacts with NO_x to create nitrogen and water, both of which are not harmful to the environment.
2	Reactor (conditioning tower)	Hydrated lime and activated carbon are injected into the flue gas stream in the reactor. This reduces levels of acid gases and filters out harmful pollutants. Water is also injected for conditioning of the flue gases for optimum conditions for treatment.

#	Function	Description
3	Bag house filter	The bag house filter removes the mixture of activated carbon, hydrated lime, reaction products from the reactor stage and remaining boiler fly ash that is entrained within the flue gas from the reactor stage. They remove the pollutants from the exhaust gas that have been adsorbed into the treatment reagents. The resulting mixture captured within the filter bags and removed is termed Flue Gas Treatment residues (FGTr).
4	Wet scrubber	The wet scrubber acts as a final stage to further absorb acid gases, reduce ammonia and reduce volumes of particles and heavy metals within the flue gas. A wet scrubber has been chosen due to the significantly improved emissions performance when compared to a fully dry or semi-dry system. An additional benefit of the wet scrubber is the possible reduction in hydrated lime usage that can be achieved in the reactor stage.
5	Induced Draft (ID) fan	The ID fan is used to allow the flue gases to flow through the treatment process.
6	Continuous Emissions Monitoring System (CEMS)	To monitor compliance with the emissions limits set out in the IED and Waste Incineration BREF, and to inform use of reagents, a CEMS system will be installed. This is discussed further below in this chapter.
7	Stack	The stack is used to disperse cleaned flue gases from the facility. The stack height and stack parameters are discussed further in the Air Quality chapter of this EIS (see **Technical report A Air Quality and Odour Assessment Report**).

The reagents used for flue gas cleaning are:

- Hydrated lime
- Ammonia water
- Activated carbon
- Sodium lye (a solution of sodium hydroxide).

Reagent dosing will be controlled using real time feedback from the emissions monitoring system. This will allow operational optimisation of consumable use to meet the emissions limits.

The only output from the FGT equipment will be FGTr. The wet scrubber will not generate a separate residue as the residue from the wet scrubber will be re-used within the reactor stage. Any residue from the wet scrubber will therefore be removed in the bag filter system and disposed of as FGTr. Further information is provided in **Technical Report D Best Available Techniques Assessment**.

3.4.15 Continuous Emissions Monitoring System (CEMS)

Each line will be equipped with a dedicated CEMS. The CEMS allows continuous online monitoring of flue gas properties, content of pollutants and composition, thus allowing the control system to track those pollutants which can feasibly be measured online, to make automatic adjustments to the combustion system and the injection rates for the various FGT system reagents (hydrated lime, activated carbon and ammonia water). The systems will track trends over time and will give a system response automatically to the operators at various set points to allow action to be taken if needed to make sure approved emission limit values are not breached. The system also generates reports at a user defined frequency to demonstrate environmental performance.

The emissions monitoring will comply with the conditions of the NSW EfW policy, the IED and the BREF document for waste incineration. Continuous monitoring will then be installed for all pollutants that must be continuously monitored, including:

- Oxides of nitrogen (NOx)
- Carbon monoxide (CO)
- Particulates (dust)
- Total Volatile Organic Compounds (TVOCs)
- Hydrogen chloride (HCl)
- Hydrogen fluoride (HF) if needed under the provisions of the NSW EfW Policy Statement
- Sulphur dioxide (SO2)
- Ammonia (NH3)
- Mercury (Hg).

Additionally, the CEMS will monitor auxiliary parameters such as:

- Flue gas flow rate
- Temperature
- Pressure
- Moisture content
- Oxygen
- Carbon dioxide.

For those pollutants with levels so small that they are below any possible limits of detection and/or for which online measurement is not technically possible or sufficiently accurate, a periodic sampling and testing regime will instead be created as part of the facilities standard operating procedures and likely EPL requirements, to make sure that the facility is constantly in compliance with its environmental obligations. Such pollutants are:

- Heavy metals with the exception of Mercury (As, Cd, Co, Cr, Cu, Mn, Ni, Pb, Sb, Tl, V)
- Nitrous Oxide (N_2O)
- Dioxins and Furans.

3.4.16 Ash management

Combustion of solid fuel (including waste) that contains an incombustible fraction will always create ash that must be managed. The proposal will produce three types of ash:

1. Incinerator Bottom Ash (IBA) – the inert, non-combustible component of the waste that is left on the grate at the end of the combustion process and is collected at the bottom of the grate.
2. Boiler Fly Ash – some of the ash from the combustion process that becomes entrained in the flue gases and makes its way up into the main boiler section. It is then deposited in the boiler sections before any flue gas treatment reagents are injected into the process.
3. Flue Gas Treatment residues (FGTr) – FGTr is the name given to any residues that are extracted from the process after the addition of flue gas treatment reagents. FGTr is a combination of spent reagents and the leftover entrained ash within the flue gases that did not become deposited in the boiler section. FGTr will be extracted from the flue gases within the bag house section of the treatment plant.

The following section describes the strategy for management of each of the ash streams.

3.4.16.1 Incinerator Bottom Ash (IBA)

The IBA contains much of the ash generated by the facility. IBA is discharged from the end of the combustion grate into a water bath which will quench the ash to reduce the temperature. During the quenching process, any gases generated will end up in the combustion chamber and be thermally treated. Wet IBA is about 20% moisture content but will not be a sludge as it is not saturated with water. The low level of moisture will be sufficient to prevent dust generation.

After quenching, the IBA is carried along a vibrating conveyor with a 'scalper' which removes oversized items into skips. Oversized items from the skips will be manually transferred to the ferrous metal bunker. Cleaning of bulky material is not required.

The remaining portion of IBA is transferred along conveyors to the IBA hall for intermediate storage. An over-belt magnet is fitted to the conveyors which removes ferrous metals during this process.

The WSERRC will therefore include two recovery systems before the IBA is conveyed to the storage bays:

1. A scalper which is a device to remove and recover any bulky items entrained within the IBA. These will be deposited in a storage bunker onsite for storage before being removed offsite for recovery.
2. A ferrous metal separator to recover ferrous metal from the IBA. This will be deposited into a storage bunker and removed offsite for recovery.

IBA will be stored in a bunker with a minimum of five days storage capacity. The IBA hall will be ventilated mechanically. Mechanical ventilation is provided by a dust extraction system that extracts from the bunkers with replacement air supplied via inlet dampers in the façade. The facility will have a fully enclosed ash handling system for IBA and no ash treatment or long-term ash storage will occur on site.

IBA will then be transferred offsite to a separate IBA processing facility (to be developed) where further metals recovery will also take place. Options for the offsite recovery and reuse of IBA in construction products are being investigated, building on experience in other jurisdictions where ash is used in construction materials. Recovery and use of IBA would be undertaken in accordance with the EPA's resource recovery framework. Further details regarding the offsite IBA processing facility and secondary metals recovery can be found in **Chapter 22 Related development**.

Waste classification will be conducted in accordance with relevant NSW EPA guidelines and periodic composition testing of ash (at least every 3 months in line with BAT) will be undertaken. It is typical to begin testing of ash during the commissioning process to confirm properties and waste classification. This will be done in conjunction with the requirements of the NSW EPA under the Protection of the Environment Operations (Waste) Regulations 2014.

3.4.16.2 Boiler fly ash

Boiler fly ash is the name given to ash that becomes entrained in the flue gases and makes its way through the boiler and treatment system. Along the way, this ash can condense and fall out of the air flow and into the different sections of the boiler. Boiler fly ash that collects in the radiant boiler passes 2 and 3 will be disposed of alongside the IBA. This boiler fly ash is substantially similar in properties to IBA, so to increase the amount of ash that can be recycled, the proposal will divert this proportion of boiler fly ash to the IBA bunker.

Boiler fly ash recovered downstream of pass 3 is not suitable for disposal with the inert IBA due to its higher concentration of heavy metals. So, it will be diverted to the FGTr stream to be transported for pre-treatment at Cleanaway's hazardous solid waste treatment facility at St Mary's. Then it will be disposed of to a licenced restricted solid waste landfill facility such as at Kemps Creek.

3.4.16.3 Flue Gas Treatment residues (FGTr)

Flue gas treatment residues (FGTr) contain spent flue gas treatment reagents as well as residual boiler fly ash that has remained entrained within the flue gases through the flue gas treatment stages. FGTr is collected within the bag house filters and will be conveyed to silos for temporary storage. The current design includes two silos to allow for redundancy in the system. FGTr are classified as hazardous waste due to their ecotoxicity and physical characteristic, so they cannot be reused in the same way that IBA can. Sealed pneumatic tankers designed in accordance with AS/NZS 1210 will be used to transport FGTr. The tankers will securely connect to the silo outlet via a hose connection and FGTr will be deposited from the silo into the tanker in a controlled manner. The most credible scenario for the release of FGTr onsite is a failure of the hose during transfer of the FGTr from the silo to the sealed vehicle. Safe operation and maintenance of systems such as spill management procedures will be implemented to limit failure.

FGTr will be transported for pre-treatment at Cleanaway's hazardous waste treatment facility located at St Mary's before being disposed of to a licenced restricted solid waste landfill facility such as at Kemps Creek. The St Mary's facility has the capacity and is licenced to treat FGTr material. There is no limit on the annual processing capacity at St Mary's as stipulated in the facility's EPL (EPL 20271). However, there is a limit on storage at the facility i.e. the quantity of waste, treated or otherwise, stored on the premises must not exceed 5000 tonnes at any one time. In the case that the St Mary's facility is not available, FGTr will be sent to another suitably licenced facility.

Waste classification will be conducted in line with relevant NSW EPA guidelines and periodic testing of FGTr will be undertaken. It is typical to begin testing of ash during the commissioning process to confirm properties and waste classification. This will be done in conjunction with the requirements of the NSW EPA under the Protection of the Environment Operations (Waste) Regulations 2014. Given the ash is likely to be classified as hazardous (and therefore a 'trackable' waste), engagement will be required with the NSW EPA to put in place a tracking system, including allowances for consignment authorisations and tracking certificates.

About dix days of storage will be installed on site for collection of FGTr across the silos.

3.4.17 Water use

There are a variety of uses for water within the facility. Water uses include:

- Boiler make-up water to compensate for boiler blow-down and other losses
- Flue gas conditioning pre-treatment and SNCR
- IBA quenching
- Other small water consumption from general facilities, such as toilets and kitchen, alongside wash-down water used for maintenance.

Additionally, in commissioning of the boiler plant, water will be used for the first fill of the system.

The main objective regarding water use is to reuse as much water as possible.

The following water-saving techniques have been identified:

- Water from the wet scrubber outlet will be captured and used within the flue gas conditioning stage.
- Rejected water from the make-up plant and from boiler blow-down will be used within the IBA quench.

This means that no process wastewater generated onsite will require treatment outside of the facility in normal operation. A water treatment plant will be installed so that the water quality of feedwater is suitable for use within the boiler.

Cleaning water from the process hall (boiler/FGT hall) will be collected in drain trenches in the floor and used within the process.

If for any reason wastewater from the process must be exported offsite, which is not currently foreseen, tankers will be used to collect the water and deliver it to a suitably licensed treatment facility.

The exact facility to be used for disposal would depend on the specification of the water which would have to be tested prior to disposal. WSERRC commits to testing any wastewater prior to disposal (if any) and selecting a suitable facility in compliance with legislation in NSW. Further information is provided under BAT 3 in **Technical Report D Best Available Techniques Assessment**.

3.4.18 Summary of Stored Waste Volumes on Site

Table 3.7 provides a summary of the maximum volume of different wastes that can be stored on site for licensing purposes. These figures include a level of contingency and the site is not expected to operate at maximum capacity for a prolonged period.

Table 3.7: Maximum quantity of on-site waste storage

Parameter	Maximum Tonnage (T)	Estimated Volume (m^3)
Incoming waste bunker storage capacity	17,000	38,000
Waste water for process use storage capacity	300	300
Incinerator bottom ash storage capacity	1,800	1,800
Metals and oversize storage capacity	250	250
FGTr storage capacity	360	360

The facility has been suitably designed to allow for the storage of the waste streams identified above. With respect to the waste bunker, the maximum volume provided in **Table 3.7** includes closure of 50% of the tipping bays which would only be required during an extended public holiday period. For most of the time, all tipping bays will be open, and the bunker will have a capacity of 12,600 tonnes. The design allows for this variation.

Volumes of consumable material held on site is included in **Chapter 14 Hazards and Risks** of this EIS.

3.4.19 Operating modes and Upset Conditions

The facility has been designed to operate in several operating modes which have all been considered as part of this EIS. Each of the modes has been listed below with a general description of each.

- **Normal operation** – Normal operation is defined by operation of the facility within the limits of the firing diagram, combusting waste and generating electricity. This will be the main operating mode for the facility. In normal operation, no fuel source other than waste will be needed.

- **Start-up** – Start-up of the facility is expected several times per year after planned maintenance has taken place. Each boiler line can be started up individually. In a normal start-up sequence, a small amount of electricity is imported from the electricity grid. Auxiliary burners using diesel fuel heat the boiler. This heating process typically lasts 8 to 12 hours. Only when the boiler is heated to 850°C, is waste fed on to the grate. At all times in start-up, the flue gas treatment equipment will be operational. When steam quality (temperature and pressure) is sufficient, the turbine will start up.
- **Shutdown** – In a shutdown sequence waste will stop being fed onto the grate. The auxiliary diesel burners will fire so that the boiler is always heated to 850°C until all waste on the grate has been burnt out and none remains. Then the auxiliary burners will shut down and the boiler will cool. At all times when waste is on the grate, the flue gas treatment system will continue to operate.
- **Upset conditions** – Abnormal operating conditions could occur in operation, for example if there was a component failure or an electricity failure.

The proposal has been designed so that in all cases, the facility can be brought to a safe, controlled stop that adheres to environmental requirements.

- Normal operation is defined as operation within the firing diagram envelope shown in **Figure 3.7**. All points within this envelope have been fully assessed within the **Air Quality and Odour Assessment (Technical Report A)**.
- There will be no operation outside of the firing diagram envelope with the exception of start-up and shut down during which times the facility has been designed to minimise emissions.
- Any upset condition that means it is not possible to maintain operation within the limits of normal operation will lead to an immediate shut down of the facility to rectify the problem. This will be facilitated by both automatic control from the DCS and CEMS as well as the ability for manual shut down by the operator. Thus, the only activities that will take place outside the limits of the firing diagram will be start up and shut down under which cases the facility has been designed to minimise emissions.

Table 3.8 outlines the operating conditions that could be encountered at the facility alongside the design embedded mitigation measures and potential impact to the environment.

Table 3.8: Operating conditions (including upset conditions)

Condition	Mitigation	Impact
Normal operation within the bounds of the firing diagram	The facility is designed to control the combustion air, waste feed, grate speed and FGT system for different volumes of waste and waste quality. At all times, any failure of the FGT system that cannot be corrected by the site wide DCS or the operator will cause the respective line to close-down safely. In case of a licensed emission limit value exceedance, the facility will be immediately shut down by the operator.	At all times during operation, the hourly and 24-hourly average emission limit values as set out in **Chapter 8 Air Quality and Odour,** will be met.
Operation with high or low calorific value (outside of normal operational limits)	In case of high calorific value waste, the waste throughput will be reduced. In case of low calorific value waste, either increase of the waste throughput or auxiliary burners will sustain the combustion to make sure the requirement for 2 seconds residence time at 850ºC is respected. Mixing of the waste in the bunker will mitigate against this risk.	Quantity of flue gases will change depending on the amount of waste. Emission limit values will be met. The worst-case conditions (highest possible flue gas flow rate) have been modelled in **Technical report A: Air Quality and Odour Assessment**.
Changes in waste composition	The facility has been designed to accommodate different waste compositions. This is achieved with a well-designed combustion diagram and flexible equipment throughout. Operationally, mixing of the waste in the bunker will mitigate against significant changes in waste composition.	No impact, emission limit values will be met.
Single line operation	The facility utilises two independent boiler lines each with its own dedicated FGT system. Each line can operate independently of the other and the facility has been designed to accommodate the operation of one or two lines. The only time that operation on a single line would occur is if the second line is shut down (for example, for maintenance).	No impact, emission limit values will be met.
Plant operating - Turbine failure and/or Turbine transformer failure – Bypass mode	The facility can continue to operate and, if necessary, shut down safely in turbine bypass mode using electricity from the grid or the emergency power systems.	No impact, emission limit values will be met.
Plant operating – Island mode (grid failure)	The facility can continue to operate and, if necessary, shut down safely in island mode using electricity from the steam turbine to sustain power load.	No impact, emission limit values will be met.

Condition	Mitigation	Impact
Start-up sequence to normal operation	The start-up sequence uses auxiliary diesel burners over an 8 to 12-hour period to heat the boiler to 850°C. This is the point where the SNCR section of the FGT system becomes operational. Only when the furnace is heated to 850°C can the waste be fed onto the grate. Once waste is being fed, the combustion of the waste produces enough energy to sustain the process temperature. The FGT system is always operational during start up with the exception of the SNCR system which must be heated to 850°C for successful operation. This is why auxiliary burners, without waste, are used during start up. Waste will never be combusted without the full FGT system (including SNCR) being operational. Additionally, at all times, the advanced combustion control system, reagent dosing system and CEMS will be operational to monitor and control the process to minimise emissions.	The design of the FGT system is such that, even if the flue gas conditions change during start-up, emissions are minimised.
Facility shutdown (normal operation)	In the event of a complete facility shutdown the facility will cease to combust waste. Waste being fed onto the grate will cease and the auxiliary burners will activate so the boiler temperature remains at 850°C until no waste remains on the grate. This process usually takes 1 to 1.5 hours. When there is no more waste on the grate, the auxiliary burners and FGT system will shut down. Waste will never be combusted without the full FGT system (including SNCR) being operational. Additionally, at all times the advanced combustion control system, reagent dosing system and CEMS will be operational to monitor and control the process to minimise emissions. During shut down, the SNCR system will be fully operational until all waste remaining on the grate has been combusted and the auxiliary burners have shut-off.	The design of the flue gas treatment system is such that, even if the flue gas conditions change during shutdown, emissions are minimised.
Plant operating, failure on one line (emergency shutdown)	The process for shut down under emergency situations is exactly the same as a normal shut down.	The design of the flue gas treatment system is such that, even if the flue gas conditions change during shutdown, emissions are minimised.

Condition	Mitigation	Impact
Black-out (safe shutdown with emergency power)	In the case of a grid blackout and plant failure the facility will be shut down using emergency power systems, the UPS and a diesel generator. The shutdown sequence is exactly the same as a normal shutdown.	The design of the flue gas treatment system is such that, even if the flue gas conditions change during shutdown, emissions are minimised.
Presence of unacceptable waste (e.g. hazardous waste)	There are a variety of quality assurance and quality control procedures designed to mitigate the risk of receiving unacceptable waste at site. If a small fraction of unacceptable waste is not identified, there are additional design contingency measures in place. Mixing of the waste on site means that any item of unacceptable waste will not be concentrated. If combusted, the FGT system is designed to appropriately deal with the pollutants formed.	No impact, emission limit values will be met.
High load of pollutants	Combustion of waste with a high content of pollutants may give rise to increased emissions. This will be mitigated by using the waste acceptance (QA/AQ) protocol, mixing waste within the bunker to develop a more homogeneous waste, a well-designed FGT system and CEMS so that emission limit values are not breached.	No impact, emission limit values will be met.
Large waste items	Large waste items may cause blockage of the waste feed funnel leading to poor control of air flow and therefore poor combustion characteristics. WSERRC includes a shredder to mitigate against oversized waste.	No impact, emission limit values will be met.
Failure of essential equipment	Failure of a variety of essential equipment, including boiler feedwater pumps, FGT equipment and scrubber pumps could lead to a facility shutdown and short-term increase in emissions. This is mitigated by including a sufficient level of redundancy within the installed equipment. Failure of one component of the FGT system will not lead to failure of the entire system. For example, bag filters will include redundant rows such that any damage caused to one row activates the standby, while that row is repaired. This philosophy is followed as far as reasonably practicable throughout the design. The shutdown period, during which all FGT is still operational will take 1 to 1.5 hours, this is the time taken for waste that is on the grate at the point of shut down, when the waste feed stops, to fully burn out.	No impact, emission limit values will be met or the facility would enter shutdown.

3.5 Ancillary equipment and Balance of Plant

There is a variety of ancillary equipment and Balance of Plant (BoP) that is needed to enable the safe and reliable operation of an EfW facility. This includes:

- Electrical connection
- Electrical equipment and controls such as transformers, low and high voltage switchgear and circuit boards
- Small power such as lighting and power for the administration and visitor and education centre
- Mechanical equipment such as pumps, motors, safety valves, conveying systems
- Compressed air systems
- Fire safety systems
- Tanks (both water and fuel storage)
- Weighbridges
- Silos for storage of treatment reagents and FGTr
- Small plant such as front loaders.

The exact specifications of the balance of plant and ancillary equipment will be decided in the detailed design phase. However, all equipment installed will be designed to comply with standards and legislation in New South Wales.

3.6 Fire and emergency procedures

Fire and emergency measures and procedures have been developed at a concept level, including space proofing. These measures include:

- Enough space in the site layout for emergency response vehicles to circulate around the site
- Designated emergency exit routing with appropriate signage and guidance in line with local fire regulations
- Site wide fire alarm (audio and visual)
- Thermal imaging cameras to detect hotspots in the waste in the bunker hall
- Fire damper within the boiler feed hopper if there is a fire passing from the boiler to the feed hopper
- CCTV installed at strategic locations throughout the facility to monitor for both safety and security of staff and visitors

- Strategically located fire suppression at main points around the facility, including fire hydrants, fire extinguishers, water cannons and sprinkler systems
- Fire detection systems throughout the facility
- Hardstanding for fire trucks to park adjacent to the fire tanks.
  Exact configurations will be agreed with FireNSW
- A facility-wide vacuum cleaning system to reduce the likelihood of dust build-up
- Appropriate ventilation of the IBA building to prevent the build-up of hydrogen causing an explosive atmosphere
- Equipping the IBA building with hydrogen gas sensors and alarms
- Storage of acids and bases in line with AS 3780-2008, and the obligations under the Work Health and Safety Regulations 2011
- Correct separation of dangerous goods in line with AS/NZS 3833-2017
- Enough bunding and storage capacity for dangerous goods
- Real-time monitoring to recognise leaks within the ammonium hydroxide silos
- Preparation of a notification and evacuation procedure
- Preparation of a pollution incident response management plan (PIRMP) which is to include coordination with local response organisations such as FRNSW and NSW Ambulance services
- Lighting of the stack in line with the Federal Aviation Administration's (FAA) AC 70/7460-1L: Obstruction Marking and Lighting
- Fire water tanks for the availability of firefighting water alongside a fire water pumping station. The tanks that will always have a minimum 4hr supply of water held per line, which is enough should the facility need to shut down.
  The minimum volume of water needed will always be held onsite.

These measures will be further developed in the detailed design.

Chapter 4

Statutory context

4 Statutory context

4.1 Introduction

This chapter identifies the statutory context that applies to the WSERRC proposal and the land on which the WSERRC would be built, including:

- The permissibility of the proposal on the site
- The development assessment pathway and consent authority
- Relevant NSW legislation
- Relevant Commonwealth legislation
- Matters to be considered by the consent authority
- How the proposal meets the relevant requirements.

Several additional projects referred to as related development are required to support the operation of the WSERRC. These will be assessed and determined through separate approval processes because the scope of related development is not sufficiently developed to allow a detailed assessment of environmental impacts to be undertaken at this stage and/or they are assessed under a different planning pathway to WSERRC. Refer to **Chapter 22 Related development** for more details on these developments that are not part of the scope of this proposal.

4.2 Permissibility

The State Environmental Planning Policy Western Sydney Parklands 2009 (WSP SEPP) is the principal environmental planning instrument (EPI) controlling development and land use planning in the Parklands. Its aim is to put in place development controls that would enable the Western Sydney Parklands Trust (WSPT) to develop a multi-use urban parkland for Western Sydney. All land in the Parklands is unzoned. All forms of private development other than residential or exempt development are permitted with consent. The provisions of specific Local Environmental Plans (LEPs), including the Blacktown LEP 2015, do not apply to the WSP as per clause 6 (1) of the WSP SEPP.

The WSERRC can be characterised as electricity generating works (EGW), defined in the dictionary to the Standard Instrument Principal Local Environmental Plan (SIPLEP) as '*a building or place used for…making or generating electricity*'.

The SIPLEP also identifies a category of development called waste or resource management facility (WRMF).

A WRMF includes a resource recovery facility (RRF) defined as:

'a building or place used for the recovery of resources from waste, including works or activities such as separating and sorting, processing or treating the waste, composting, temporary storage, transfer or sale of recovered resources, energy generation from gases and water treatment, but not including re-manufacture or disposal of the material by landfill or incineration'.

The metals recovery component of WSERRC fits within the definition of resource recovery.

WSP SEPP describes its relationship with State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) as:

- The development controls in Part 3 of the ISEPP apply as if the WSP were in a prescribed zone under ISEPP.
- Part 3, division 4 and division 23 of the ISEPP confirm that EGW and WRMF are permissible with consent in a prescribed zone.

Therefore, the ISEPP applies and EGW and WRMF land uses are permissible with consent in the WSP, including the proposed site. A decision to grant development consent is available to the consent authority, subject to the application demonstrating the merits of the proposal.

4.3 Assessment pathway and consent authority

The WSERRC will be assessed and determined under division 4.7 of the *Environmental Planning & Assessment Act 1979* (EP&A Act) because of its classification as State significant development (SSD).

Clause 20 of Schedule 1 of State Environmental Planning Policy (State and Regional Development) 2011 (SRD SEPP) declares that EGW, using any energy source, including gas, coal, biofuel, distillate, waste, hydro, wave, solar or wind power, are SSD if they have a capital investment value (CIV) of more than $30m. The estimated CIV for the proposal is around $645m. A statement of CIV is included in **Appendix D Statement of CIV**. WSERRC is therefore SSD for the purposes of Schedule 1 of the SRD SEPP.

As the site is located in the WSP, it is also classified as SSD under Schedule 2 of the SRD SEPP as it is development that has a CIV of more than $10m on land identified as being within the WSP on the WSP Map within the meaning of State Environmental Planning Policy (Western Sydney Parklands) 2009.

This means the WSERRC will be assessed in line with the provisions in division 4.7 of Part 4 of the NSW EP&A Act.

The consent authority for SSD is either the Minister for Planning and Public Spaces or the Independent Planning Commission (IPC). The IPC is the consent authority where the proposal is a:

> *(a) development in respect of which the council of the area in which the development is to be carried out has duly made a submission by way of objection under the mandatory requirements for community participation in Schedule 1 to the Act,*
>
> *(b) development in respect of which at least 50 submissions (other than from a council) have duly been made by way of objection under the mandatory requirements for community participation in Schedule 1 to the Act,*
>
> *(c) development the subject of a development application made by a person who has disclosed a reportable political donation under section 10.4 to the Act in connection with the development application.*

For the purposes of calculating the number of submissions, each of the following is to be counted as one submission:

- A petition
- Any submissions that contain the same or substantially the same text.

4.4 Relevant NSW legislation

4.4.1 Environmental Planning & Assessment Act 1979 and Environmental Planning and Assessment Regulation 2000

The EP&A Act is the principal piece of legislation relating to the assessment and determination of development in NSW. An assessment of how the proposal meets the objects of the Act is included in **Chapter 25 Evaluation and conclusions**.

An application for SEARs was lodged with DPIE on 13 November 2019 and SEARs were issued on 12 December 2019. This EIS has been prepared in line with the SEARs, with a checklist of where in the EIS each SEAR has been addressed (**Appendix A**).

As SSD, the proposal will be assessed and determined under division 4.7 of the Act.

Section 4.41 of the Act lists authorisations that are not needed for SSD for which a development consent has been received. Authorisations under this section that are likely to be relevant to WSERRC are:

> *(g) a water use approval under section 89, a water management work approval under section 90 or an activity approval (other than an aquifer interference approval) under section 91 of the Water Management Act 2000.*

Section 4.42 of the Act lists authorisations that cannot be refused if necessary, for carrying out SSD for which a development consent has been received. Such authorisations are to be substantially consistent with the consent. Authorisations under this section that are relevant to WSERRC are:

> *(e) an environment protection licence under Chapter 3 of the Protection of the Environment Operations Act 1997 (for any of the purposes referred to in section 43 of that Act).*

The *Environmental Planning and Assessment Regulation 2000* contains key operational provisions for the NSW planning system. The requirements and provisions for EISs are set out in Schedule 2 of the regulation. Clauses 6 and 7 of the Schedule set the form and content of an EIS. **Table 4.1** describes where the form and content requirements set out in clauses 6 and 7 are dealt with in this EIS.

Table 4.1: Schedule 2 of the EP&A Regulation 2000

Regulation	WSERRC EIS
Clause 6 Form of environmental impact statement	
(1) An environmental impact statement must contain the following information: (a) the name, address and professional qualifications of the person by whom the statement is prepared	Refer to the **Certification page**
(b) the name and address of the responsible person	Refer to **Section 1.4** of **Chapter 1 Introduction**
(c) the address of the land (i) in respect of which the development application is to be made, or (ii) on which the activity or infrastructure to which the statement relates is to be carried out	Refer to **Section 1.3** of **Chapter 1 Introduction**
(d) a description of the development, activity or infrastructure to which the statement relates	Refer to **Chapter 3 Proposal description**
(e) an assessment by the person by whom the statement is prepared of the environmental impact of the development, activity or infrastructure to which the statement relates, dealing with the matters referred to in this Schedule	This EIS
(f) a declaration by the person by whom the statement is prepared to the effect that (i) the statement has been prepared in accordance with this Schedule, and (ii) the statement contains all available information that is relevant to the environmental assessment of the development, activity or infrastructure to which the statement relates, and (iii) that the information contained in the statement is neither false nor misleading.	Refer to the **Certification page**

Regulation	WSERRC EIS
Clause 7 Content of environmental impact statement	
(1) An environmental impact statement must also include each of the following: (a) a summary of the environmental impact statement	Refer to the **Executive Summary**
(b) a statement of the objectives of the development, activity or infrastructure	Refer to **Section 1.2** of **Chapter 1 Introduction**
(c) an analysis of any feasible alternatives to the carrying out of the development, activity or infrastructure, having regard to its objectives, including the consequences of not carrying out the development, activity or infrastructure	Refer to **Section 2.6** of **Chapter 2 Strategic context**
(d) an analysis of the development, activity or infrastructure, including: (i) a full description of the development, activity or infrastructure, and	Refer to **Chapter 3 Proposal description**
(ii) a general description of the environment likely to be affected by the development, activity or infrastructure, together with a detailed description of those aspects of the environment that are likely to be significantly affected, and	Refer to **Chapter 7 Environmental assessment scope**
(iii) the likely impact on the environment of the development, activity or infrastructure, and	Refer to **Chapters 7 to 23**
(iv) a full description of the measures proposed to mitigate any adverse effects of the development, activity or infrastructure on the environment, and	Refer to **Chapter 24 Summary of management and mitigation measures**
(v) a list of any approvals that must be obtained under any other Act or law before the development, activity or infrastructure may lawfully be carried out,	Refer to **Chapter 4 Statutory context**
(e) a compilation (in a single section of the environmental impact statement) of the measures referred to in item (d)(iv),	Refer to **Chapter 24 Summary of management and mitigation measures**
(f) the reasons justifying the carrying out of the development, activity or infrastructure in the manner proposed, having regard to biophysical, economic and social considerations, including the principles of ecologically sustainable development set out in subclause (4). Note. A cost benefit analysis may be submitted or referred to in the reasons justifying the carrying out of the development, activity or infrastructure.	Refer to **Chapter 25 Evaluation and conclusions**
(2) Subclause (1) is subject to the environmental assessment requirements that relate to the environmental impact statement.	Refer to **Appendix A SEARs Checklist**

4.4.2 Other NSW legislation

Table 4.2. describes other NSW legislation relevant to the proposal.

Table 4.2: Other NSW legislation relevant to the proposal.

NSW legislation	Overview and relevance
Protection of the Environment Operations (POEO) Act 1997	The Act is the main legislation regulating pollution control and management of waste. It states that persons carrying out scheduled activities must hold an Environment Protection Licence (EPL) which sets up requirements for managing and reporting on the environmental performance of an activity. The proposal will be a scheduled activity for the purposes of the Act and will need an EPL. The relevant activities in Schedule 1 of the POEO Act include: • Energy recovery from general waste (clause 18) • Thermal treatment of general waste (clause 40) • Waste storage (clause 42). A suitable operator with experience in managing an EfW facility and complying with relevant environmental regulations will be appointed to partner with Cleanaway to operate the proposal. The selected operator will need to demonstrate they are eligible to hold an EPL, having regard to the requirements of the POEO Act including clause 45 (f) which states: whether the person concerned is a fit and proper person. Fit and proper persons are defined by reference to criteria in clause 83 of the POEO Act which include the environmental compliance record, the technical competency, the character honesty and integrity and financial capacity of the person who will hold the EPL.
Waste Avoidance and Resource Recovery (WARR) Act 2001	The Act aims to encourage the most efficient use of resources and to reduce environmental harm in line with the principles of ecologically sustainable development. It also aims to make sure that resource management options are considered against the waste management hierarchy: i. Avoidance of unnecessary resource consumption ii. Resource recovery, including reuse, reprocessing, recycling and energy recovery iii. Disposal. An assessment of the proposal against the objectives and requirements of the WARR Act is covered in **Chapter 2 Strategic context**.
The Protection of the Environment Operations (Waste) Regulation 2014	The Waste Regulation was introduced to improve the EPA's ability to protect human health and the environment. Specific provisions relevant to the proposal include: • The Regulation sets the contributions to be paid by the occupiers of scheduled waste facilities for each tonne of waste received at the facility or generated in a particular area. • Provides for certain reporting and record-keeping requirements about scheduled waste facilities. An assessment of how the proposal will meet the requirements of the regulation is given in **Section 4.2** of **Technical report C Waste and Resource Management Assessment.**

NSW legislation	Overview and relevance
Protection of the Environment Operations (Clean Air) Regulation 2010	Sets statutory emission limits and operating requirements for industrial plant and activities. The proposal's compliance is covered in **Technical report A Air Quality and Odour Assessment Report.**
Biodiversity Conservation Act 2016	The Act creates a framework for assessing and offsetting biodiversity impacts from proposed development, including the management and protection of listed threatened species. As the site has habitat protected under the Act, a biodiversity assessment in line with the Act has been carried out and is documented in **Technical report Q Biodiversity Development Assessment Report.**
Fisheries Management Act 1994	The Act provides for the protection and management of aquatic species, mainly fish, from commercial and recreational fishing. Part 7 of the Act deals with the protection of aquatic habitat and Part 7A deals with threatened species conservation. No threatened flora or fauna under the Act are mapped within the site and/or are likely to occur. The proposal will not involve any waterway crossings with works limited to channel works within a first order stream only. As such, approval under the Act is not likely to be needed. Refer to **Technical Report Q.**
National Parks and Wildlife Act 1974	The Act aims to protect the State's natural and cultural heritage. It is the main legislation relied on within the State to effectively manage and protect the State's Aboriginal cultural heritage. An Aboriginal Cultural Heritage Assessment Report (ACHAR) was prepared (**Technical Report O** and **Chapter 19 Heritage**), and the proposal area exhibits a very low sensitivity for Aboriginal archaeological sites and has high levels of previous disturbance. The archaeological potential of the proposal area is as very low.
Heritage Act 1977	This Act is the main legislation relied on within the State to effectively manage and protect the State's non-Aboriginal cultural heritage. Non-Aboriginal heritage is discussed in **Section 19.3.2** of **Chapter 19 Heritage**, which states that there are no non-Aboriginal heritage features located at or close to the site which could be potentially impacted by the proposal.
Biosecurity Act 2015	This Act aims to protect natural resources from the negative impact of pests, disease, weeds and contaminants. All plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. The requirements of the Act regarding containing and disposing of weed material during vegetation clearance have been covered in the Vegetation Management Plan (VMP) in Appendix G to the Biodiversity Development Assessment Report (**Technical report Q**). The proposal involves the transportation and handling of waste onsite. Waste will be delivered to the site by enclosed waste delivery vehicles. A Waste Vehicle Inspection bay will be adjacent to the weighbridges which is where inappropriate waste loads will be detected. Waste is then unloaded into the waste storage bunker where it begins the EfW process.

NSW legislation	Overview and relevance
	The facility will only accept residual waste, so green waste should not be coming through the facility. Due to the standard operating procedures in place at the facility and the nature of both the waste stream being processed and how it is being processed (combustion in an enclosed facility), the Biosecurity Act is unlikely to apply to site operations.
Roads Act 1993	Approval under section 138 of the Act is required to impact on or carry out work on or over a public road. The proposal will not impact on a public road, however, the proposed access road which will be assessed and determined through a separate approval process as described in **Chapter 22 Related development** will impact on the Austral Bricks Road. This is described further in Chapter 22.
Western Sydney Parklands Act 2006	Under Part 4, division 1, clause 22, land does not form part of the Parklands unless the land is Trust land or land of a government agency. Clause 2(j) of the WSP SEPP allows for interim uses on private land in the Western Parklands if such uses do not adversely affect the establishment of the Western Parklands or the ability of the Trust to carry out its functions as set out in section 12 of the *Western Sydney Parklands Act (WSP Act) 2006.* **Table 4.3** assesses the proposal against section 12 of the Act and it shows that the proposal does not adversely affect the ability of the Trust to carry out its functions. **Table 4.3** also includes an assessment against section 19 of the Act which describes the functions of the Trust regarding roads in the Parklands.
Contaminated Land Management Act 1997	The purpose of this Act is to establish a process for investigating and remediating contaminated land. A Detailed Site Contamination Investigation (DSI) was carried out and is documented in **Technical report G**. The investigation concluded that all soil, water and gas concentrations were within the adopted site assessment criteria, except for asbestos impacted soils, asbestos containing materials (ACM) found in near surface soil and lead beneath one of the workshops. A draft Remediation Action Plan (RAP) (see **Technical report G2**) was prepared for the site and will be carried out to make the site suitable, from a contamination risk perspective, for the proposed land use before building and in line with SEPP 55. In addition, when first acquiring the site, it was found that the proposal site had an Individual Biosecurity Direction (IBD) due to the site having been detected previously for Salmonella Enteritidis (SE) due to past poultry activities. A letter was received from the Department of Industries (DPI) dated 26 May 2020 which stated '*The NSW DPI Chief Veterinary Officer has approved the status of your property to change from a SE Infected Premise to a Resolved Premise, as you have completed decontamination and 2 sets of SE negative clearance sampling*' and therefore the Individual Biosecurity Direction has been revoked on the proposal site.

NSW legislation	Overview and relevance
Water NSW Act 2014	This Act establishes a framework for the efficient, effective, safe and financially responsible use of water. The site access will be over the Warragamba pipeline. However, site access works do not form part of this EIS and is discussed in **Chapter 22 Related development**. Vibration impacts to the Warragamba Pipeline will be avoided by carrying out a Construction Noise and Vibration Management Plan (CNVMP), which includes a construction vibration monitoring programme. The purpose of the monitoring programme is to avoid vibration over set criteria. Trigger levels will be established, which when reached, will stop any work. Work will only continue with alternative construction methods so that any vibration impacts are avoided (see **Chapter 13 Noise and vibration**). Similarly, erosion and sediment controls will be applied to minimise impacts resulting from water runoff are mitigated (see **Chapter 11 Soils and water**).
Water Management Act 2000	The objective of this Act is to provide for the sustainable and integrated management of the State water sources. The Act includes provisions for protecting and enhancing the environmental qualities of waterways and their catchments. The proposal won't interact with waterfront land. The proposal (by building the bunker) will intercept the groundwater table and is not expected to need a licence for aquifer interference under the Act.
Pesticides Act 1999	The Act controls the use of pesticides in NSW. It aims to reduce risks to human health, the environment, property, industry and trade promote collaborative and integrated policies for pesticide use. Any use of pesticides will comply with the Pesticides Regulations under this Act.
Public Health Act 2010	The objectives of this Act are to: • Promote, protect and improve public health • Control the risks to public health • Promote the control of infectious diseases • Prevent the spread of infectious diseases • Recognise the role of local government in protecting public health • Monitor diseases and conditions affecting public health. The proposal will protect public health by ensuring appropriate mitigation measures are in place to avoid impacts to human health from air quality impacts or hazards and risks. (See **Chapter 8 Air quality and odour**, **Chapter 9 Human health risk** and **Chapter 14 Hazards and risks**).

Table 4.3 gives a summary assessment of the proposal against section 12 and 19 of the WSP Act.

Table 4.3: An assessment of the proposal against section 12 and 19 of the WSP Act

Regulation	WSERRC EIS
Section 12 Functions – generally	
(1) The principal function of the Trust is to develop the Parklands into a multi-use urban parkland for the region of Western Sydney and to maintain and improve the Parklands on an ongoing basis.	The vision and future land use for the Western Sydney Parklands is described in the Western Sydney Parklands Plan of Management 2030 which includes plans for each of the 16 precincts. The proposal is consistent with the objectives and future land uses for the Wallgrove Precinct as described in the **Chapter 2 Strategic context**.
(2) The Trust also has the following functions: (a) to conserve, restore and enhance the natural environment of the Parklands, including through the protection of remnant bushland and the restoration of vegetation or revegetation,	The site is located on the western periphery of the Parklands in an area that is previously disturbed and is home to industrial and waste management facilities. Since acquisition of the site, the owners have arranged for cleaning of the site to address historical salmonella contamination associated with the previous use of the site as a poultry production facility. Development of the proposal will include clearing of weeds along the drainage channels in the site and realignment and planting of the overland flow path along the Eastern boundary to reflect natural conditions. Water quality treatment measures will improve the quality of water leaving the site, draining into Reedy Creek and Eastern Creek further north. Species within the threatened Cumberland Shale Plains Woodland vegetation class are native to the proposal site. However, the existing site is degraded and dominated by exotic grass and weeds, with small patches of regrowth in poor to very poor condition. It is the aim of the planting design for the proposal to restore and celebrate this native vegetation by use of tree, shrub, grass and riparian species. A Vegetation Management Plan has been prepared which describes the approach to vegetation management including specification of native planting consistent with the biodiversity of the Parklands.
(b) to conserve, restore and enhance the cultural and historical heritage of the Parklands, including its Indigenous heritage and its scenic qualities,	The proposal has very low potential to impact both Aboriginal and non-Aboriginal heritage. Refer to **Chapter 19 Heritage**. Although the archaeological potential of the proposal area is assessed as very low. There is still potential for the cultural and historical heritage of the WSPs to be interpreted and incorporated in detailed design, including, but not limited to plaques, murals, paving and visitors centre display.

Regulation	WSERRC EIS
(c) to provide or facilitate the provision of a diverse range of recreational, entertainment and tourist facilities and opportunities in the Parklands, such as major sporting facilities, private amusement and recreational attractions and accommodation,	The proposal is consistent with the future land uses identified for the Wallgrove Precinct including recycling and renewable energy. In addition, the proposal will include a visitor and education centre that will be an education resource to raise awareness of the principles of waste management, waste avoidance, the circular economy, recycling, resource recovery and EfW.
(d) to cater, at a regional level, for a diverse range of community interests, organisations and groups, including through the provision of facilities such as multi-use community halls,	The proposal will include a visitor and education centre that will be an education resource to raise awareness of the principles of waste management, waste avoidance, the circular economy, recycling, resource recovery and EfW.
(e) to facilitate the use of the Parklands to meet community health needs and provide opportunities for, and encourage, activities that promote health and well-being in the community,	The proposal does not interfere with the ability of the Trust to carry out this function.
(f) to encourage and promote public access to and use and enjoyment of the Parklands where appropriate,	The proposal will include a visitor and education centre to offer education through a world-class visitor centre experience and facility tour which will encourage visitors to the WSP. The landscape design allows for an attractive site for visitor experience, from the entrance and along the eastern area to the visitor’s centre.
(g) to facilitate and promote the use of the Parklands for education and research (such as scientific research), including the provision of facilities for these purposes (such as camping facilities, learning centres and accommodation),	The proposal will include a visitor and education centre that will be an education resource to raise awareness of the principles of waste management, waste avoidance, the circular economy, recycling, resource recovery and EfW.
(h) to ensure that government agencies and State-owned corporations continue to have access to major service infrastructure within the Parklands,	The Greater Sydney Region Plan and Central City District Plan emphasise the importance of developing a city that is serviced by infrastructure. The WSERRC will offer a critical infrastructure service to the people and businesses of Western Sydney by providing a waste management service and generating baseload energy, part of which is categorised as renewable. The WSERRC will be of service to local councils who are responsible for the management of waste.

Regulation	WSERRC EIS
(i) to maintain the rural character of parts of the Parklands by allowing sustainable agriculture, horticulture or forestry in the Parklands,	The site has an industrial and agricultural history having previously been used for poultry production and is surrounded by waste infrastructure limiting the recreational and amenity value of the site. The site has been historically contaminated with the site having previously been detected for Salmonella Enteritidis (SE) due to past poultry activities (which has since been rectified) and asbestos and lead was also found during the DSI which will need to be remediated before the land being used. By using a parcel of land with limited value due to adjoining industry and contamination, it is avoiding other areas in the Western parklands that are better suited for agriculture, horticulture and forestry.
(j) to undertake or provide, or facilitate the undertaking or provision of, commercial, retail and transport activities and facilities in or in relation to the Parklands with the object of supporting the viability of the management of the Parklands.	The proposal does not interfere with the ability of the Trust to carry out this function.
(3) The Trust may do all such supplemental, incidental or consequential acts as may be necessary or expedient for the exercise of its functions, including, for example, merchandising or the sale of the Trust's expertise in relation to any matter for the purpose of raising funds for its operations.	The proposal does not interfere with the ability of the Trust to carry out this function.
(4) (Repealed)	Not applicable.
(5) In carrying out its functions, the Trust is to have regard to the principles of sustainable development, including ecologically sustainable development.	The proposal contributes to the sustainable management of valuable resources that would otherwise have been disposed to landfill, and in doing so creates a source of renewable energy. The design of the proposal has incorporated ESD principles. Details of how these principles have been considered and applied can be found in **Chapter 25 Evaluation and conclusions.**
(6) The Trust may, with the consent of the Minister, exercise functions on or in relation to land outside the Parklands (including, for example, acquiring any such land). The consent of the Minister is to be given only if the Minister is satisfied that the exercise of the Trust's functions in relation to that land is consistent with the exercise of its functions in relation to the Parklands.	The proposal does not interfere with the ability of the Trust to carry out this function.
(7) The Trust has such other functions as are conferred or imposed on it by or under this or any other Act.	The proposal does not interfere with the ability of the Trust to carry out this function.

Regulation		WSERRC EIS
Section 19 Roads[1]		
(1)	A road that is or would be situated in the Parklands cannot be provided, opened, dedicated, closed (within the meaning of Part 4 of the *Roads Act 1993*) or realigned by the Crown, a public authority or any person except with the consent of the Trust.	The proposal will need upgrades to and building of entry and exit to the site, to accommodate the proposal's traffic movements. However, site access works do not form part of the scope of this proposal and this is discussed in **Chapter 22 Related development**.
(2)	Except as provided by subsection (1), this Part does not affect the application of the *Roads Act 1993* or any other Act to any such road.	Noted.

Other NSW legislation approvals which may be required

Other approvals that may be needed but are not related to the environmental planning and assessment process, include approvals under the following legislation:

- *Electricity Supply Act 1995*
- *Scrap Metal Industry Act 2016.*

4.4.3 Relevant State Environmental Planning Policies

Table 4.4 lists the state environmental planning policies (SEPP) that are relevant to the proposal or the land on which the proposal would be built.

Table 4.4: State environmental planning policies relevant to the proposal

SEPP	Overview and relevance
SEPP (Infrastructure) 2007	Creates a planning framework for the development of infrastructure. ISEPP is a basis for the permissibility of electricity generating works as described in **Section 4.2** of this chapter. ISEPP requires traffic generating developments to be referred to the NSW Roads and Maritime Services for assessment. The proposal will be traffic generating development and will be referred to RMS as described in **Chapter 15 Traffic and transport**.
SEPP (State and Regional Development) 2011	Creates a framework for categorising development into SSD, State significant infrastructure (SSI) and Regionally Significant Development (RSD) as well as recognising the consent authority for each type of development. As described in **Section 4.3** of this chapter, the proposal is SSD as it is EGW with a CIV of more than \$30m for the purposes of clause 20 of Schedule 1 of the SEPP and is development in the WSP with a CIV of more than \$10m for the purposes of Schedule 2 of the SEPP.

[1] Section 12 of the WSP Act describes the general functions of the WSP Trust with clauses 13–21 describing specific additional functions. Section 19 Roads is the only specific function of relevance to this proposal.

SEPP	Overview and relevance
SEPP (Western Sydney Parklands) 2009	Creates a framework for the planning and development of the Western Sydney Parklands. The SEPP identifies matters for consideration by a consent authority when assessing an application for development consent in the WSP. **Section 4.6** of this chapter discusses these matters. Consistency with the Plan of Management 2030, including the Wallgrove Precinct Plans, is a relevant matter for consideration when assessing development within the Parklands. The consistency of the proposal with the Plan of Management is described in **Table 2.3** of **Chapter 2 Strategic context**. The SEPP identifies its relationship to other EPIs. The following provisions are relevant to the proposal: • The Blacktown LEP 1988 does not apply in the Parklands • SEPP 19 Bushland in Urban Areas does not apply in the Parklands • SEPP 64 Advertising and Signage does not apply in the Parklands • SEPP Exempt and Complying Development Codes does not apply in the Parklands • Part 3 of ISEPP apply as if the Parklands were in a prescribed zone for the purposes of ISEPP • If there is an inconsistency between WSP SEPP and SEPP 55 Remediation of Land, SEPP 55 prevails to the extent of any inconsistency.
SEPP (Coastal Management) 2018	The SEPP gives effect to the objectives of the *Coastal Management Act 2016* from a land use planning perspective, by specifying how development proposals are to be assessed if they fall within the coastal zone. The proposal site does not fall within the coastal zone therefore the SEPP is not relevant to the proposal.
SEPP (Sydney Drinking Water Catchment) 2011	The SEPP aims to provide healthy water catchments and to make sure that development in the catchment areas have a neutral or positive effect (NorBe) on water quality. The proposal site is not located in the catchment area defined in the SEPP. However, the WSP SEPP applies a neutral or positive impact (NorBI) test to the water quality in the bulk water supply infrastructure in the WSP. The proposal has assessed compliance with this requirement of the WSP SEPP as detailed in **Chapter 9 Human health risk**.
SEPP No 33 – Hazardous and Offensive Development	Provides the basis for defining hazardous and offensive development. A screening assessment was performed which confirmed the need for a Preliminary Hazard Analysis (PHA). The PHA is included as **Technical report J**.
SEPP No 55 – Remediation of Land	The SEPP requires that land on which development is proposed is suitable for the intended use. The SEPP and guidelines set out requirements for the management of contaminated land. A Detailed Site Contamination Investigation (DSI) was carried out and is documented in **Technical report G**. The investigation concluded that all soil, water and gas concentrations were within the adopted site assessment criteria, except for asbestos impacted soils, asbestos containing materials (ACM) found in near surface soil and lead beneath one of the workshops.

SEPP	Overview and relevance
	A draft Remediation Action Plan (RAP) (included as **Technical report G2**) was prepared for the site and will be carried to make the site suitable, from a contamination risk perspective, for the proposed land use before building. In addition, when first acquiring the site, it was found that the proposal site had an Individual Biosecurity Direction (IBD) due to the site having been detected previously for Salmonella Enteritidis (SE) due to past poultry activities. A letter was received from the Department of Industries (DPI) dated 26 May 2020 which stated *'The NSW DPI Chief Veterinary Officer has approved the status of your property to change from a SE Infected Premise to a Resolved Premise, as you have completed decontamination and 2 sets of SE negative clearance sampling'* and therefore the Individual Biosecurity Direction has been revoked on the proposal site.
SEPP No 64 – Advertising and Signage	The SEPP sets out planning controls for advertising and signage in NSW. The SEPP requires signage to be compatible with the future character of an area, offer effective communication in suitable locations and be of high-quality design and finish. The SEPP does not apply in the WSP area. However, it will be considered as a guideline for the design of business identification signage as part of future detailed design.
SEPP (Vegetation in non-rural areas) 2017	The Vegetation SEPP aims to protect the biodiversity values of trees and other vegetation in non-rural areas of the State, and to preserve the amenity of non-rural areas of the State through the preservation of trees and other vegetation. Vegetation must not be cleared from non-rural areas without first getting authorisation to do so. However, such an authorisation is not required if the vegetation clearing is authorised under another approval as identified in section 60O of the *Local Land Services Act 2013*. An approval under Part 4 of the *Environmental Planning and Assessment Act 1979* is one of the approvals identified under section 60O. As the WSERRC SSD application is made under Part 4 of the Act, if approved, it would provide the necessary approval for vegetation clearing and no further authorisation under the Vegetation SEPP would be needed.
Proposed Aerotropolis SEPP	The Western Sydney Aerotropolis Discussion Paper on the Proposed State Environmental Planning Policy was published in December 2019. The Discussion Paper identifies a new land use framework for the Aerotropolis including measures to protect the airspace of the new Western Sydney Airport. While the proposal is located outside the proposed boundary for the SEPP, it has assessed potential impacts on protected airspace as described in **Chapter 14 Hazards and risks.**

4.5 Relevant Commonwealth legislation

4.5.1 Environment Protection and Biodiversity Conservation Act 1999

The Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) is administered by the Department of Agriculture, Water and Environment and sets up a legal framework to protect and manage nationally important flora, fauna, ecological communities and heritage places defined as 'matters of national environmental significance' (MNES). An action that '*has, will have or is likely to have a significant impact on a matter of National Environmental Significance'* may not be undertaken without prior approval from the Commonwealth Minister, as stated under Part 9 of the EPBC Act.

A referral must be made for actions that are likely to have a significant impact on the following matters protected by Part 3 of the EPBC Act:

- World heritage properties
- National heritage places
- Wetlands of International importance
- Listed nationally threatened species and ecological communities
- Listed migratory species
- Commonwealth marine areas
- The Great Barrier Reef Marine Park
- Nuclear actions including uranium mining
- Water resources for coal seam gas or large mining development.

The purpose of a referral is to decide on whether the proposed action is a controlled action that will need further assessment and approval under the EPBC Act.

An assessment of whether the proposal may have a significant impact on any MNES or on the environment of Commonwealth land was made during the preparation of this EIS. This included a search using the Protected Matters Search Tool (PMST) and the review of the conclusions from various technical reports.

The assessment determined that the proposal is unlikely to impact any MNES. As such, a referral will not be made to the Commonwealth Minister for the Environment.

Table 4.5: Assessment of potential impacts to MNES

Matters of National Environmental Significance	Application to the Proposal Site	Relevant Section of EIS
World heritage properties	Not applicable	Not applicable
National heritage places	Not applicable	Not applicable
Ramsar wetlands of international importance	Not applicable	Not applicable
Listed threatened species and communities	Not applicable	Not applicable
Internationally protected migratory species	Not applicable	Not applicable
Commonwealth marine areas	Not applicable	Not applicable
The Great Barrier Reef Marine Park	Not applicable	Not applicable
Nuclear actions	Not applicable	Not applicable
A water resource for coal seam gas development and large coal mining development	Not applicable	Not applicable

4.5.2 Native Title Act 1993

The Native Title Act 1993 recognises that First Australians have rights and interests to land and waters which derives from their traditional laws and customs. Native title may be recognised in places where First Australians continue to follow their traditional laws and customs and have maintained a link with their traditional country. It can be negotiated through a Native Title Claim, an Indigenous Land Use Agreement (ILUA) or future act agreements.

An ILUA is an agreement between a native title group and other parties who use or manage the land and waters. The ILUA process allows for negotiation between First Australians and other parties over the use and management of land and water resources, and the ability to establish a formal agreement. An ILUA is binding once it has been registered on the Native Title Tribunal's Register of Indigenous Land Use Agreements.

The Aboriginal Cultural Heritage Assessment Report (**Technical report O**) discusses the details of Aboriginal consultation carried out for the proposal. The consultation did not raise any issues regarding Native Titles or Indigenous Land Use Agreements.

4.5.3 National Greenhouse and Energy Reporting Act 2007

The National Greenhouse and Energy Reporting Act 2007 (NGER Act) sets up a single national framework for the reporting and dissemination of information about corporate greenhouse gas (GHG) emissions, energy use and production. It makes registration and reporting mandatory for corporations whose energy production, energy use or GHG emissions meet specified thresholds.

Under the current reporting year, NGERs applies to a facility or corporate group that emits over 25,000t and 50,000t or more of greenhouse gas (CO_2-e) Scope 1 and Scope 2 emissions respectively, or produce or consume 100TJ (for a facility) or 200TJ (for a corporate group) or more of energy. Based on the reporting thresholds, Cleanaway as a corporate group entity are obligated to report under the NGER scheme on a corporate level. As a result, GHG emissions resulting from the facility will be reported under the NGER scheme through Cleanaway once the facility becomes operational. As the facility itself would produce more than 100TJ of energy (or 440 GWh, equivalent to about 1,583 TJ), the reporting threshold is met irrespective.

A Greenhouse Gas and Energy Efficiency Assessment Report has been prepared and is included as **Technical report N**.

4.5.4 Airports Act 1996

The Airports Act 1996 (the Act) creates the regulatory arrangements which apply to the airports formerly owned and operated on behalf of the Commonwealth by the Federal Airports Corporation, and Sydney West Airport.

The Federal Government protects the airspace around leased Federal airports under Part 12 of the *Airports (Protection of Airspace) Regulations 1996.*

The Act and its supporting regulation aim to make sure that the airspace that aircraft fly in is protected, is obstacle free, that there is no turbulence in the flight path, that radar and other navigational equipment can operate free of interference and that airport safety lighting is not obscured.

Protected airspace includes two sets of surface limitations, Obstacle Limitation Surfaces (OLS) and Procedures for Air Navigational Services – Aircraft Operations (PANS-OPS) surface. As the OLS is the lowest surface and designed to protect aircraft flying into an airport from obstacles this is the most relevant for the proposal. An OLS for the Western Sydney Airport was included in the Western Sydney Airport – Airport Plan and declared on 10 October 2017. The height of the OLS relevant to the proposal site is 222.2m Australian height datum (AHD). Under the Act, constructing a building or structure that intrudes into a 'prescribed airspace' is referred to as a 'controlled activity'. Relevant to the proposal this includes development, including temporary or permanent structures or intrusions such as air turbulence from stacks, that infringes on the airport's protected airspace. The Act outlines that it is an offence to carry out a 'controlled activity' without an approval and such developments will be subject to conditions.

The Civil Aviation Safety Authority (CASA) was created under the *Civil Aviation Act 1988* to regulate aviation safety regulation. CASA gives advice on structures or sources of emissions that may pose a hazard to aircraft including through stack plume emissions.

Details of the proposal were made available to CASA to allow a Plume Rise Assessment to be performed. A summary of the CASA Plume Rise Assessment was received on 28 April 2020 and can be found in Appendix D to the Preliminary Hazard Analysis (**Technical report J**). The summary states that

'based on the information presented and assumed, there will not be an infringement of an OLS for Western Sydney Airport (WSA). CASA recommends that an Acceptable Level of Safety will be achieved'.

The risk of interference with an aircraft from a plume rise is therefore considered to be negligible.

4.5.5 National Airports Safeguarding Framework

The National Airports Safeguarding Framework sets out guiding principles to minimise the amenity impacts of airports on surrounding land uses and to make sure surrounding land uses do not present a safety risk to the operation of any airport. The aspects of the NASF of relevance to the proposal are:

- **Guideline C:** Managing the risks of wildlife strikes in the vicinity of airports

  The site is outside the 13km radius of an airport as a potential risk for wildlife strikes advised by Guideline C. Further, since the entire process is contained inside the facility and waste is not exposed, wildlife attraction is not expected. The site also includes means to contain the potential odours which could attract wildlife.

- **Guideline D:** Managing the Risk of Wind Turbine Farms as Physical Obstacles to Air Navigation

  Paragraph 21 of Guideline D advises that the RAAF AIS should be notified of any structure 45m or more above ground level, however according to CASA's *AC 139-08: Reporting of tall structures and hazardous plume sources*, Airservices is now responsible for the database of tall structures.

  This triggered a notification to Airservices Australia via email on 23 April 2020. An Airservices assessment was carried out for Sydney, Bankstown, Camden and Richmond aerodromes, and Westmead Hospital heliport completed on 22 May 2020 which concluded that

  'Airservices have no objections to the proposed plume rise at the proposal location'.

Further details can be found in Appendix E to the Preliminary Hazard Analysis (**Technical report J**).

- **Guideline F:** Managing the risk of intrusions into the protected airspace of airports

  Attachment 3 of Guideline F describes the process that should be followed by planning authorities. Western Sydney Airport Corporation (WSA Co) was notified via email on 23 April 2020 of a potential intrusion into the protected airspace of airports. Consultation with WSA Co occurred on 22 May 2020 which included the discussion of this potential intrusion. On 28 May 2020, WSA responded with a letter stating that

  'In relation to the OLS and PANS-OPS, there is no PANS-OPS designed yet for WSA and whilst it likely that the PANS-OPS surface will be at or higher than the OLS levels, this won't be known until the detailed airspace design is completed by the Commonwealth. The currently declared protected airspace for WSA is the OLS'.

  Details of this letter can be found in Appendix F to the Preliminary Hazard Analysis (**Technical report J**).

  As noted above, the summary of the CASA plume rise assessment stated that based on the information presented and assumed, there will not be an infringement of an OLS for Western Sydney Airport (WSA).

4.6 Matters for consideration

The general matters to be considered by a consent authority in determining a development application are described in section 4.15 of the Act. In addition, the WSP SEPP identifies matters to be considered by a consent authority when determining an application for development on land in the WSP. **Table 4.6** and **Table 4.7** assess how the proposal addresses the general matters and WSP specific matters.

Table 4.6: General matters for consideration – section 4.15 of the Act

Matter	WSERRC
(1) Matters for consideration – general 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 that apply to the land to which the development application relates	Refer to **Section 4.4.3** of this chapter.

Matter	WSERRC
(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 Planning Secretary has notified the consent authority that the making of the proposed instrument has been deferred indefinitely or has not been approved) that apply to the land to which the development application relates, and	There are no proposed instruments that are relevant to the proposal.
(iii) any development control plan that apply to the land to which the development application relates	Development control plans do not apply to development in the Western Sydney Parklands. The Western Sydney Parklands Trust (WSPT) developed the Plan of Management 2030 to set up the strategic framework for the Parklands and helps the WSPT in determining its priorities and actions over the coming years. The proposed site is in the Wallgrove Precinct (Precinct 6). The land use framework described in the Plan of Management identifies several land use opportunities for the WSP which are covered in **Table 2.3** of **Chapter 2 Strategic context.**
(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 that apply to the land to which the development application relates, and	The applicant has included in the EIS an offer and draft terms for a Voluntary Planning Agreement (VPA) to be entered into with Blacktown City Council (BCC) under clause 7.4 of the Environment Planning and Assessment Act 1979 (see **Appendix G**). Should Blacktown City Council wish to pursue the offer for a VPA, the VPA shall be publicly exhibited for 28 days in accordance with the Environment Planning and Assessment Act 1979 prior to determination of the Proposal.
(iv) the regulations (to the extent that they prescribe matters for the purposes of this paragraph) that apply to the land to which the development application relates	Refer to **Section 4.4** of this chapter.
(v) **(Repealed)**	Not applicable.
(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	Refer to **Chapters 7 to 23**

Matter	WSERRC
(c) the suitability of the site for the development	This site was identified via an extensive site screening analysis and noted as the most suitable site to develop an EfW facility for various reasons including: • The site having previously been used for industrial purposes and the industrial and commercial nature of the surrounding land uses creating the potential for synergies with surrounding industry. • The site being an optimal size and configuration to design an EfW facility being a rectangular shaped lot. • The site avoiding existing and planned residential areas, rural land uses and future airspace restrictions. • The site's distance from sensitive residential and other receptor locations. Further information can be found in **Section 2.6.5.2** of **Chapter 2 Strategic context**.
(d) any submissions made in accordance with this Act or the regulations	Submissions made in response to the exhibition of the EIS will be addressed by a Response to Submissions Report.
(e) the public interest.	The proposal is in the public interest as it addresses two key challenges including: • The processing and treatment of residual waste that would otherwise be sent to landfill thus supporting the NSW Government targets for landfill diversion and responsible waste management and reducing the burden of landfills on the environment and communities • Providing a source of baseload energy, part of which is categorised as renewable, contributing to NSW Government objectives for energy security and renewable energy. The proposal will also include a visitor and education centre that will be an education resource to raise awareness of the principles of waste management, waste avoidance, the circular economy, recycling, resource recovery and EfW. Environmental impacts will be minimised by developing and operating the EfW facility to international best-practice standards that protect the health of people and the environment in the surrounding area. Specific public and stakeholder interests were identified through a comprehensive community and stakeholder engagement strategy (**Chapter 6 Engagement**), including how these interests have been considered in the EIS. Refer to **Chapter 25 Evaluation and conclusions** for an assessment of the public interest.

Table 4.7: WSP SEPP matters for consideration

Matter	WSERRC
Clause 12: Matters to be considered by the consent authority—generally	
In determining a development application for development on land in the Western Parklands, the consent authority must consider such of the following matters as are relevant to the development: (a) the aim of this Policy, as set out in clause 2	Refer to **Table 4.8** of this chapter.
(b) the impact on drinking water catchments and associated infrastructure	The proposal will not have unacceptable impacts on drinking water catchments as detailed in **Chapter 9 Human health risk**.
(c) the impact on utility services and easements	The impacts on existing utilities on the site are described in **Chapter 20 Utilities and services**. Offsite utilities works are described in **Chapter 22 Related development**. The site is split into two parts by a thin strip of land not part of the proposal site, but which includes a 'right of carriageway' that benefits the site allowing vehicles to travel across the strip of land. The right of carriageway will not be impacted by the proposal.
(d) the impact of carrying out the development on environmental conservation areas and the natural environment, including endangered ecological communities	The Cumberland Shale Plains Woodland found on the proposal site is consistent with the NSW *Biodiversity Conservation Act 2016* (BC Act) listed Cumberland Plains Woodland critically endangered ecological community. The vegetation within the proposal site does not meet the EPBC Act requirements as a listed TEC due to the poor condition of the vegetation and the small area of the woodland. Refer to **Chapter 21 Biodiversity**. It is the aim of the planting design for the proposal to restore and celebrate this native vegetation by use of tree, shrub, grass and riparian species.

Matter	WSERRC
(e) the impact on the continuity of the Western Parklands as a corridor linking core habitat such as the endangered Cumberland Plain Woodland,	Species within the threatened Cumberland Shale Plains Woodland vegetation class are native to the proposal site. However, the existing site is degraded and dominated by exotic grass and weeds, with small patches of regrowth in poor to very poor condition. It is the aim of the planting design for the proposal to restore and celebrate this native vegetation by use of tree, shrub, grass and riparian species. A VMP included as Appendix G to the Biodiversity Development Assessment Report **(Technical report Q**) has been prepared to guide the revegetation works and restoration of the overland flow path onsite. Existing mature native trees will be retained where possible and safe to do so, particularly along the overland flow path. Native planting within the site will provide biodiversity links to surrounding vegetation corridors. Refer to **Chapter 21 Biodiversity** and **Appendix B Architecture and Landscape Design Strategy Report.**
(f) the impact on the Western Parkland's linked north-south circulation and access network and whether the development will enable access to all parts of the Western Parklands that are available for recreational use,	The location of the site on the western perimeter of the Parklands avoids impact on the main north-south circulation and access network that runs through the Parklands. The site is in the Wallgrove Precinct which comprises services land and industrial facilities not accessible to the public.
(g) the impact on the physical and visual continuity of the Western Parklands as a scenic break in the urban fabric of western Sydney,	The proposal has been designed to minimise impacts on viewpoints. See **Chapter 16 Landscape and visual** and **Appendix B Architecture and Landscape Design Strategy Report**.
(h) the impact on public access to the Western Parklands,	The proposal does not impact on public access to the Parklands.
(i) consistency with: (i) any plan of management for the parklands, that includes the Western Parklands, prepared and adopted under Part 4 of the Western Sydney Parklands Act 2006, or (ii) any precinct plan for a precinct of the parklands, that includes the Western Parklands, prepared and adopted under that Part	An analysis of how the WSERRC is consistent and supports the objectives of the *Western Sydney Parkland Plan of Management 2030 – Precinct 6: Wallgrove* can be found in **Chapter 2 Strategic context.**
(j) the impact on surrounding residential amenity	Impact on residential amenity is assessed throughout the impact assessment section, **Chapter 8 Air quality and odour**, **Chapter 13 Noise and vibration**, **Chapter 16 Landscape and visual** and **Chapter 17 Social**.

Matter	WSERRC
(k) the impact on significant views	The proposal has been designed to minimise impacts on viewpoints. **Chapter 16 Landscape and visual** and **Appendix B Architecture and Landscape Design Strategy Report**.
(l) the effect on drainage patterns, ground water, flood patterns and wetland viability	The site has been designed to minimise impacts from flooding such as realignment of the overland flow path. No wetlands have been mapped within the study area. The EfW facility will require an excavation for the waste bunker of about 15m deep which may intercept and possibly obstruct shallow groundwater flow both during construction and operation. As no significant groundwater is expected to be encountered at the proposed excavation depths, the potential impacts to shallow groundwater flow are negligible. Refer to: **Chapter 12 Hydrology and flooding** **Chapter 21 Biodiversity** and **Chapter 11 Soils and water.**
(m) The impact on heritage items	The proposal has very low potential to impact both Aboriginal and non-Aboriginal heritage. Refer to **Chapter 19 Heritage**.
(n) the impact on traffic and parking.	While the proposal will increase traffic generation, the impacts on the road network and the nearest intersections on Wallgrove Road and Austral Bricks Road will maintain the same level of service as currently available. The site has also been designed to accommodate all parking demand from the proposal. Refer to **Chapter 15 Traffic and transport**.
Clause 13: Bulk Water Supply Infrastructure not to be impacted	
Development consent must not be granted to any development on land in the Western Parklands unless the consent authority is satisfied that: (a) the development will have a neutral or positive impact on the quality of the water in the bulk water supply infrastructure shown on the Bulk Water Supply Infrastructure Map, and	The bulk water supply infrastructure map identifies the Warragamba pipeline corridor and Prospect reservoir. The proposal will not impact on the water quality of the pipeline as it is enclosed. The impacts of the proposal on the water quality of prospect reservoir are assessed in the Human Health Risk Assessment (**Technical report B**).
(b) the development will not impact on the integrity or security of the bulk water supply infrastructure, and	Vibration impacts to the Warragamba Pipeline will be avoided by carrying out a Construction Noise and Vibration Management Plan (CNVMP), which includes a construction vibration monitoring programme. The purpose of the monitoring programme is to avoid vibration over set criteria. Trigger levels will be established, which when reached, will stop any work. Work will only continue with alternative building methods so that any vibration impacts are avoided (see **Chapter 13 Noise and vibration**).

Matter	WSERRC
	Similarly, erosion and sediment controls will be applied to minimise impacts resulting from water runoff are mitigated. (see **Chapter 11 Soils and water**).
(c) the development will not increase the risk of illegal access to the bulk water supply or security of the bulk water supply infrastructure, and	The site will be fully fenced and secured during construction and operation and will not increase the risk of illegal access to the bulk water supply infrastructure.
(d) access to bulk water supply infrastructure for maintenance and operation activities by Water NSW and Sydney Water Corporation will not be impeded by the development.	The proposal will not impact on the ability to maintain the Warragamba pipelines. Site access needs to be upgraded to accommodate the proposal's traffic movements and to respond to concerns of Water NSW regarding accessing the pipelines for maintenance. The proposal is to upgrade site access largely within the existing site access footprint to minimise any impacts on access to the pipeline for maintenance. However, site access does not form part of this proposal, refer to **Chapter 22 Related development.**
Clause 14: Development in areas near nature reserves or environmental conservation areas	
(1) This clause applies to development on land in the Western Parklands that is in, or adjoins: (a) a nature reserve (within the meaning of the *National Parks and Wildlife Act 1974*), or (b) an environmental conservation area shown on the Environmental Conservation Areas Map.	The proposal is not located on land that is in or adjoins a nature reserve or an environmental conservation area.
(2) Development consent must not be granted to development on land to which this clause applies, unless the consent authority has considered the following: (a) whether the development is compatible with and does not detract from the values of the nature reserve or environmental conservation area	The site is located on the western periphery of the Parklands in an area that is previously disturbed and is home to industrial and waste management facilities. Since acquisition of the site, the owners have arranged for cleaning of the site to address historical salmonella contamination associated with the previous use of the site as a poultry production facility. Development of the proposal will include clearing of weeds along the drainage channels in the site and realignment and planting of the overland flow path along the Eastern boundary to reflect natural conditions. Water quality treatment measures will improve the quality of water leaving the site, draining into Reedy Creek and Eastern Creek further north. A Vegetation Management Plan has also been prepared which describes the approach to vegetation management including specification of native planting consistent with the biodiversity of the Parklands.

Matter	WSERRC
(b) any management plans applicable to the nature reserve or environmental conservation area	The vision and future land use for the Western Sydney Parklands is described in the Western Sydney Parklands Plan of Management 2030 which includes plans for each of the sixteen precincts. The proposal is consistent with the objectives and future land uses for the Wallgrove Precinct as described in the **Chapter 2 Strategic Context.**
(c) whether the development has been designed and sited to minimise visual intrusion when viewed from vantage points in the nature reserve or environmental conservation area.	The proposal has been designed to minimise impacts on viewpoints. See **Chapter 16 Landscape and visual** and **Appendix B Architecture and Landscape Design Strategy Report**.
Clause 14A: Flood Planning	
(1) The objectives of this clause are as follows: (a) to minimise the flood risk to life and property associated with the use of land (b) to allow development on land that is compatible with the land's flood hazard, considering projected changes as a result of climate change (c) to avoid significant adverse impacts on flood behaviour and the environment.	Flood modelling has demonstrated that the overland flow path and proposed changes to the site topography will not result in an increase in flood levels at neighbouring properties for flood events up to and including the 1% AEP and will not increase flood hazard at adjacent properties for events up to and including the PMF. Therefore, the proposal will not materially impact the flood risk at these properties. Refer to **Chapter 12 Hydrology and flooding**.
(2) This clause applies to land that is at or below the flood planning level.	The eastern portion of the site near the farm dam sits below the flood planning level.
(3) Development consent must not be granted for development on land to which this clause applies unless the consent authority is satisfied that the development: (a) is compatible with the flood hazard of the land, and	Flood modelling has demonstrated that the overland flow path and proposed changes to the site topography will not result in an increase in flood levels at neighbouring properties for flood events up to and including the 1% AEP and will not increase flood hazard at adjacent properties for events up to and including the PMF. Therefore, the proposal will not materially impact the flood risk at these properties. Refer to **Chapter 12 Hydrology and flooding**.
(b) is not likely to significantly adversely affect flood behaviour resulting in detrimental increases in the potential flood affectation of other development or properties, and	The results of the flood assessment indicate that the proposal will not result in negative flood impacts on neighbouring properties. Refer to **Chapter 12 Hydrology and flooding.**
(c) incorporates appropriate measures to manage risk to life from flood, and	Under the Probable Maximum Flood (PMF) scenario assessed, the western portion of the site is shown to remain flood-free and therefore, evacuation from the facility due to PMF would not be needed. Refer to **Chapter 12 Hydrology and flooding**.

Matter	WSERRC
(d) is not likely to significantly adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of riverbanks or watercourses, and	The existing overland flow path will be maintained but realigned to better manage flows onsite and reduce flooding impacts to neighbouring sites. An OSD and bioretention basin (two interconnected basins) will be developed on the site. The western portion of the basin will act as a bioretention water quality basin which are landscaped depressions or shallow basins used to slow and treat onsite stormwater runoff. The eastern portion will act as an onsite detention (OSD) basin and include an outlet structure and emergency overflow spillway. Site stormwater runoff will be discharged from the OSD basin to the overland flow path. Refer to **Chapter 12 Hydrology and flooding** and **Chapter 21 Biodiversity**.
(e) is not likely to result in unsustainable social and economic costs to the community as a consequence of flooding.	The results of the flood assessment indicate that the proposal will not result in negative flood impacts on neighbouring properties. Refer to **Chapter 12 Hydrology and flooding**.
(4) A word or expression used in this clause has the same meaning as it has in the Floodplain Development Manual (ISBN 0 7347 5476 0), published by the NSW Government in 2005, unless it is otherwise defined in this Policy.	Noted.
Clause 15: Heritage Conservation	
(1) Objectives The objectives of this clause are: (a) to conserve the environmental heritage of the Western Parklands, and (b) to conserve the heritage significance of heritage items in the Western Parklands including associated fabric, settings and views.	The proposal has very low potential to impact both Aboriginal and non-Aboriginal heritage. Refer to **Chapter 19 Heritage**. The site is located on the western periphery of the Parklands in an area that is previously disturbed and is home to industrial and waste management facilities. The proposal has been designed to minimise impacts on viewpoints. See **Chapter 16 Landscape and visual** and **Appendix B Architecture and Landscape Design Strategy Report**.
(2) Requirement for consent Development consent is required for any of the following in the Western Parklands: (a) demolishing or moving a heritage item, (b) altering a heritage item, (c) altering a heritage item that is a building by making structural changes to its interior, (d) erecting a building on land on which a heritage item is located, (e) subdividing land on which a heritage item is located.	The proposal has very low potential to impact both Aboriginal and non-Aboriginal heritage. Refer to **Chapter 19 Heritage.**

Matter	WSERRC
(3) When consent not required However, consent under this clause is not required if: (a) the applicant has notified the consent authority of the proposed development and the consent authority has advised the applicant in writing before any work is carried out that it is satisfied that the proposed development: (i) is of a minor nature, or is for the maintenance of the heritage item, and (ii) would not adversely affect the significance of the heritage item, or (b) the development is in a cemetery or burial ground and the proposed development: (i) is the creation of a new grave or monument, or excavation or disturbance of land for the purpose of conserving or repairing monuments or grave markers, and (ii) would not cause disturbance to human remains, relics or Aboriginal objects in the form of grave goods, or (c) the development is limited to the removal of a tree or other vegetation that the consent authority is satisfied is a risk to human life or property, or (d) the development is on land to which another State environmental planning policy applies and is exempt development under that other policy	The proposal has very low potential to impact both Aboriginal and non-Aboriginal heritage. Refer to **Chapter 19 Heritage**.

Matter	WSERRC
(4) Effect on heritage significance The consent authority must, before granting consent under this clause, consider the effect of the proposed development on the heritage significance of the heritage item concerned. This subclause applies regardless of whether a heritage impact statement is prepared under subclause (5) or a heritage conservation management plan is submitted under subclause (6).	The proposal has very low potential to impact both Aboriginal and non-Aboriginal heritage. Refer to **Chapter 19 Heritage**.
(5) Heritage impact assessment The consent authority may, before granting consent to any development on land in the Western Parklands: (a) on which a heritage item is situated, or (b) within the vicinity of land referred to in paragraph (a), require a heritage impact statement to be prepared that assesses the extent to which the carrying out of the proposed development would affect the heritage significance of the heritage item.	
(6) Heritage conservation management plans The consent authority may require, after considering the significance of a heritage item and the extent of change proposed to it, the submission of a heritage conservation management plan before granting consent under this clause.	
(7) Conservation incentives The consent authority may grant consent to development for any purpose of a building that is a heritage item, or of the land on which such a building is erected, even though development for that purpose would otherwise not be allowed by this Policy, if the consent authority is satisfied that: (a) the conservation of the heritage item is facilitated by the granting of consent, and	The proposal has very low potential to impact both Aboriginal and non-Aboriginal heritage. Refer to **Chapter 19 Heritage.**
(b) the proposed development is in accordance with a heritage conservation management plan that has been approved by the consent authority, and	
(c) the consent to the proposed development would require that all necessary conservation work identified in the heritage conservation management plan is carried out, and	

Matter	WSERRC
(d) the proposed development would not adversely affect the heritage significance of the heritage item, including its setting, and	
(e) the proposed development would not have any significant adverse effect on the amenity of the surrounding area.	
Clause 16: Signage	
(1) This clause applies to signage that is visible from a public place.	The design of business identification signage will be developed as part of the detailed design and will consider relevant design guidelines.
(2) Development consent must not be granted to the erection of signage unless: (a) the consent authority is satisfied that the signage is consistent with any signage policy prepared by the Trust, and	
(b) in the case of a road sign, the Roads and Traffic Authority has been given written notice of the development application and any comments received by the consent authority from the Roads and Traffic Authority within 21 days have been considered by the consent authority.	
(3) In this clause: road sign means a sign that has a display area greater than 20 square metres or that is higher than 8 metres above the ground and is within 250 metres of a classified road and any part of the signage is visible from the classified road.	
Clause 17: Development on Private Land	
Development consent must not be granted to development on private land in the Western Parklands unless the consent authority has considered the following: (a) whether the development will contribute to or impede the implementation of the aim of this Policy	**Table 4.8** of this chapter describes how the proposal contributes to achieving the aims of the WSP SEPP.
(b) the need to carry out development on the land,	The need for EfW in meeting the objectives and targets of the WARR Strategy have been described in **Chapter 2 Strategic context**. The site was chosen following a comprehensive site selection process. Key features of the site that supported its suitability for WSERRC are its location in the Sydney Metropolitan area while maintaining a distance to residential areas of around 1km, access to transport and power infrastructure and the industrial nature of the surrounding area.

Matter	WSERRC
(c) the imminence of acquisition of the land,	The Office of Strategic Lands (OSL) administers the Planning Ministerial Corporation, the entity that would be responsible for land acquisition on behalf of the NSW Government. OSL were consulted during the development of the EIS to recognise any plans for the acquisition of the proposal site. OSL confirmed that the site is not on any plans or programmes that would indicate imminent acquisition of the site.
(d) the effect of carrying out the development on acquisition costs,	As noted above, there are no plans for the imminent acquisition of the site and the proposal, if approved, will operate for several decades. Nonetheless, the EIS has given indicative information on the market value of the land at the time of acquisition (about $19m) and the capital value of the proposal. The estimated CIV for the proposal is around $645m. A statement of CIV is included in **Appendix D**.
(e) the effect of carrying out the development on the natural systems of the Western Parklands,	The site is located on the western periphery of the Parklands in an area that is previously disturbed and is home to industrial and waste management facilities. Since acquisition of the site, the owners have arranged for cleaning of the site to address historical salmonella contamination associated with the previous use of the site as a poultry production facility. Development of the proposal will include clearing of weeds along the drainage channels in the site and realignment and planting of the overland flow path along the Eastern boundary to reflect natural conditions. Water quality treatment measures will improve the quality of water leaving the site, draining into Reedy Creek and Eastern Creek further north. A Vegetation Management Plan has also been prepared which describes the approach to vegetation management including specification of native planting consistent with the biodiversity of the Parklands.
(f) the cost of restoring those systems after the development has been carried out.	As above, the proposal will have a beneficial impact on the natural systems on the site and surrounding area. Historic uses of the site have led to invasive weeds around drainage lines and the overland flow path which will be cleared and restored as part of the proposal.

Matter	WSERRC
Clause 17A: Essential Services	
Development consent must not be granted to development unless the consent authority is satisfied that any of the following services that are essential for the proposed development are available or that adequate arrangements have been made to make them available when required: (a) the supply of water	The proposed connection to the existing Sydney Water main under Wallgrove Road is located outside the proposal site and discussed in **Chapter 22 Related development**. Fire and water tanks have also been proposed to lower the peak water demand on Sydney Water's potable water network.
(b) the supply of electricity,	This proposal will generate up to 58MW of base load electricity some of which will be used to power the facility itself with the remaining 55MW exported to the grid. A proportion of the electricity generated will be categorised as renewable. Details regarding connection of the proposal to the electricity grid are discussed in **Chapter 20 Utilities and services.**
(c) the disposal and management of sewage,	Sydney Water has been consulted with about connecting to the existing Sydney Water Sewer. It was noted that once development consent is approved, a section 73 certificate from Sydney Water will need to be applied for. Refer to **Appendix C of Utilities and services Technical report P.**
(d) stormwater drainage or on-site conservation,	Two interconnected basins are proposed to manage site stormwater runoff, to be located at the north-east area of the proposal site. The site stormwater runoff will be conveyed to these basins via the site drainage network. This will include overflow from the two 100kL rainwater tanks when they are full. Development of the proposal will include clearing of weeds along the drainage channels in the site and realignment and planting of the overland flow path along the Eastern boundary to reflect natural conditions. Water quality treatment measures will improve the quality of water leaving the site, draining into Reedy Creek and Eastern Creek further north as described in **Chapter 12 Hydrology and flooding.**
(e) suitable road access.	The proposal will require upgrades to and building of entry and exit to the site, to accommodate the proposal's traffic movements. However, site access works do not form part of the scope of this proposal and this is covered in **Chapter 22 Related development**.

Matter	WSERRC
Clause 17B: Earthworks	
The objectives of this clause are as follows: (a) to ensure that earthworks for which development consent is required will not have a detrimental impact on environmental functions and processes, neighbouring uses, cultural or heritage items or features of the surrounding land, (b) to allow earthworks of a minor nature without requiring separate development consent.	The proposal will involve earthworks, and these will be managed in line with a CEMP. Further detail on earthworks are available in **Chapter 3 Proposal description**. Relevant sections of the impact assessments have assessed the impacts during construction including **Chapter 11 Soils and water** and **Chapter 8 Air quality and odour**.
(2) Development consent is required for earthworks unless: (a) the work is exempt development under this Policy or another applicable environmental planning instrument, or (b) the work is ancillary to other development for which development consent has been given.	Noted.
(3) Before granting development consent for earthworks, the consent authority must consider the following matters: (a) the likely disruption of, or any detrimental effect on, drainage patterns and soil stability in the locality,	The soils and water assessment has considered the potential impacts to soils and water during construction and identified mitigation measures to minimise impacts. A Sediment and Erosion Control Plan will be prepared as part of the CEMP. See **Chapter 11 Soils and water** and Appendix B of **Technical report H Hydrology and Flooding Assessment Report** for further details.
(b) the effect of the proposed development on the likely future use or redevelopment of the land,	The earthworks are required to enable the development of the WSERRC proposal.
(c) the quality of the fill or the soil to be excavated, or both,	A detailed site contamination investigation (DSI) was carried out and is documented in Technical report G. The investigation concluded that all soil, water and gas concentrations were within the adopted site assessment criteria, except for asbestos impacted soils, asbestos containing materials (ACM) found in near surface soil and lead beneath one of the workshops. A draft Remediation Action Plan (RAP) (see **Technical report G2**) was prepared for the site and will be carried out to make the site suitable, from a contamination risk perspective, for the proposed land use before building and in line with SEPP 55. Refer to **Chapter 11 Soils and water**.

Matter	WSERRC
(d) the effect of the proposed development on the existing and likely amenity of adjoining properties,	The site is located on the western periphery of the Parklands in an area that is previously disturbed and is home to industrial and waste management facilities. The proposal has been designed to minimise impacts on viewpoints. See **Chapter 16 Landscape and visual** and **Appendix B Architecture and Landscape Design Strategy Report**. Impact on residential amenity is assessed throughout the impact assessment section, **Chapter 8 Air quality and odour** **Chapter 13 Noise and vibration** **Chapter 16 Landscape and visual** and **Chapter 17 Social.**
(e) the source of any fill material and the destination of any excavated material,	It is intended that all suitable excavated material, excluding weeds and rubbish, will be reused onsite as fill material. If fill must be disposed of, it will be disposed of in line with a current Resource Recovery Order and Exemption or disposed of to a licensed facility. Preliminary earthwork estimates indicate a small net import of fill to the site. Refer to **Chapter 10 Waste management.**
(f) the likelihood of disturbing relics,	The proposal has very low potential to impact both Aboriginal and non-Aboriginal heritage. Refer to **Chapter 19 Heritage**
(g) the proximity to and potential for adverse impacts on any watercourse, drinking water catchment or environmentally sensitive area,	Development of the proposal will include clearing of weeds along the drainage channels in the site and realignment and planting of the overland flow path along the Eastern boundary to reflect natural conditions. Water quality treatment measures will improve the quality of water leaving the site, draining into Reedy Creek and Eastern Creek further north as described in **Chapter 12 Hydrology and flooding.** The proposal will not have unacceptable impacts on drinking water catchments as detailed in **Chapter 9 Human health risk**.
(h) any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.	Refer to **Chapter 24 Summary of mitigation measures.**
Note. *The National Parks and Wildlife Act 1974*, particularly section 86, deals with harming Aboriginal objects.	The proposal has very low potential to impact both Aboriginal and non-Aboriginal heritage. Refer to **Chapter 19 Heritage**.

Table 4.8: WSP SEPP Aim of Policy

Aims	Relevance to proposal
Clause 2: Aim of Policy	
The aim of this Policy is to put in place planning controls that will enable the Western Sydney Parklands Trust to develop the Western Parklands into a multi-use urban parkland for the region of western Sydney by: (a) allowing for a diverse range of recreational, entertainment and tourist facilities in the Western Parklands, and	The proposal is consistent with the future land uses identified for the Wallgrove Precinct including recycling and renewable energy.
(b) allowing for a range of commercial, retail, infrastructure and other uses consistent with the Metropolitan Strategy, which will deliver beneficial social and economic outcomes to western Sydney, and	The Greater Sydney Region Plan and Central City District Plan emphasise the importance of developing a city that is serviced by infrastructure. The WSERRC will give a critical infrastructure service to the people and businesses of Western Sydney by providing a waste management service and generating baseload energy, part of which is categorised as renewable. The proposal will also contribute to raising awareness about emerging circular economy and waste management principles through the onsite visitor and education centre.
(c) continuing to allow for and facilitate the location of government infrastructure and service facilities in the Western Parklands, and	The Greater Sydney Region Plan and Central City District Plan emphasise the importance of developing a city that is serviced by infrastructure. The WSERRC will give a critical infrastructure service to the people and businesses of Western Sydney by providing a waste management service and generating baseload energy, part of which is categorised as renewable. The WSERRC will be of service to local councils who are responsible for the management of waste.
(d) protecting and enhancing the natural systems of the Western Parklands, including flora and fauna species and communities and riparian corridors, and	The site is located on the western periphery of the Parklands in an area that is previously disturbed and is home to industrial and waste management facilities. Since acquisition of the site, the owners have arranged for cleaning of the site to address historical salmonella contamination associated with the previous use of the site as a poultry production facility. Development of the proposal will include clearing of weeds along the drainage channels in the site and realignment and planting of the overland flow path along the Eastern boundary to reflect natural conditions. Water quality treatment measures will improve the quality of water leaving the site, draining into Reedy Creek and Eastern Creek further north.

Aims	Relevance to proposal
	Species within the threatened Cumberland Shale Plains Woodland vegetation class are native to the proposal site. However, the existing site is degraded and dominated by exotic grass and weeds, with small patches of regrowth in poor to very poor condition. It is the aim of the planting design for the proposal to restore and celebrate this native vegetation by use of tree, shrub, grass and riparian species. A VMP included as Appendix G to the Biodiversity Development Assessment Report (**Technical report Q**) has been prepared to guide the revegetation works and restoration of the overland flow path onsite. Existing mature native trees will be retained where possible and safe to do so, particularly along the overland flow path.
(e) protecting and enhancing the cultural and historical heritage of the Western Parklands, and	There are no non-Aboriginal heritage features located at the site which could be potentially impacted by the proposal. An Aboriginal Cultural Heritage Assessment Report (ACHAR) was carried out and is documented in **Technical report O** and **Chapter 19 Heritage**. In summary, there are cultural values (social value) associated with the general local area. However, as there are no known Aboriginal archaeological sites or areas of Aboriginal archaeological potential within the proposal area, the proposal is unlikely to impact on Aboriginal heritage. The proposal area exhibits a very low sensitivity for Aboriginal archaeological sites and has high levels of previous disturbance. Although the archaeological potential of the proposal area is assessed as very low. There is still potential for the cultural and historical heritage of the WSPs to be interpreted and incorporated in detailed design, including, but not limited to plaques, murals, paving and visitors centre display.
(f) maintaining the rural character of parts of the Western Parklands by allowing sustainable extensive agriculture, horticulture, forestry and the like, and	The site has an industrial and agricultural history having previously been used for poultry production and is surrounded by waste infrastructure limiting the recreational and amenity value of the site. The site has been historically contaminated with the site having previously been detected for Salmonella Enteritidis (SE) due to past poultry activities (which has since been rectified). A letter has since been received from the Department of Industries (DPI) dated 26 May 2020 which stated *'The NSW DPI Chief Veterinary Officer has approved the status of your property to change from a SE Infected Premise to a Resolved Premise, as you have completed decontamination and 2 sets of SE negative clearance sampling'* and therefore, the Individual Biosecurity Direction has been revoked on the proposal site.

Aims	Relevance to proposal
	Asbestos and lead were also found during the DSI which will need to be remediated before the land being used. By using a parcel of land with limited value due to adjoining industry and contamination, it is avoiding other areas in the Western parklands that are better suited for agriculture, horticulture and forestry.
(g) facilitating public access to, and use and enjoyment of, the Western Parklands, and	The proposal will include a visitor and education centre to offer education through a world-class visitor centre experience and facility tour which will encourage visitors to the WSP. The landscape design allows for an attractive site for visitor experience, from the entrance and along the eastern area to the visitor and education centre.
(h) facilitating use of the Western Parklands to meet a range of community needs and interests, including those that promote health and well-being in the community, and	The proposal will include a visitor and education centre which will be an educational resource on waste management, energy from waste and circular economy.
(i) encouraging the use of the Western Parklands for education and research purposes, including accommodation and other facilities to support those purposes, and	The proposal will include building a visitor and education centre to help educate and inform the community on the principles of waste management, waste avoidance, the circular economy, recycling, resource recovery and EfW.
(j) allowing for interim uses on private land in the Western Parklands if such uses do not adversely affect the establishment of the Western Parklands or the ability of the Trust to carry out its functions as set out in section 12 of the *Western Sydney Parklands Act 2006*	The Parklands has a long-term role in providing land with low environmental or recreational value, to meet the ongoing and expanding needs of the community for services infrastructure such as electricity, gas, telecommunications, water, and sewer. The proposal is for a development on private land, located on the western periphery of the Parklands in an area that is previously disturbed and is home to industrial and waste management facilities. The proposal is consistent with the future land uses identified for the Wallgrove Precinct including recycling and renewable energy.
(k) ensuring that development of the Western Parklands is undertaken in an ecologically sustainable way.	Details of how the ecologically sustainable development (ESD) principles have been considered and applied in the design of the proposal are included in **Chapter 25 Evaluation and conclusions**.

Chapter 5

EfW policy

5 EfW policy

5.1 Overview

This chapter outlines how the WSERRC proposal meets the requirements of the NSW Energy from Waste Policy Statement (NSW EfW policy).

This chapter includes the following:

- An overview of the NSW EfW policy and relevant requirements
- Summary of the wider policy context for waste management and resource recovery
- Summary of the waste feedstock strategy
- Overview of nominated reference facilities
- Summary of emissions to air
- Management of residual waste from the energy recovery process.

The NSW EfW policy sets out a range of requirements to determine whether EfW proposals are acceptable in New South Wales, including technical, thermal efficiency and resource recovery criteria, demonstrating best practice operations and the good neighbour principle.

Figure 5.1 lists the NSW EfW policy requirements and the various specialist technical reports and EIS chapters that demonstrate compliance with the NSW EfW policy.

NSW EfW Policy Requirements	Public consultation and the "good neighbour" principle • Genuine consultation • Providing information • Controlling impacts	Technical criteria • Complete combustion • Air emissions • Monitoring and reporting	Thermal efficiency • Electricity • Heat	Demonstrating best practice • Process design and control • Emissions control • Receiving waste • Managing residues	Resource recovery
Described in this chapter		Section 5.7: Reference facility emissions performance		Section 5.6: Reference facility summary Section 5.8: Management approach for process residues	Section 5.4: WSERRC Feedstock strategy Section 5.3: Policy context for resource recovery
Related EIS chapters providing further detail	Chapter 8 Air quality and odour Chapter 15 Traffic and transport Chapter 16 Landscape and visual Chapter 17 Social Chapter 6 Engagement	Chapter 3 Proposal description	Chapter 3 Proposal description	Chapter 8 Air quality and odour Chapter 14 Hazard and risk	Chapter 2 Strategic context
Technical report (EIS Vol 2)	Technical Report A: Air quality and odour assessment report Appendix F: Community and stakeholder engagement report		Technical Report D: Best available techniques assessment report	Technical Report C: Waste and resource management assessment report Technical Report D: Best available techniques assessment report	Technical Report C: Waste and resource management assessment report Technical Report E: Waste flow analysis for greater Sydney

Figure 5.1: NSW EfW policy requirements and the information sources which inform and support the assessment

5.2 NSW EfW policy and requirements

The NSW EfW policy creates a framework and overarching criteria to guide proposals for thermal EfW infrastructure in New South Wales. The NSW EfW policy covers all technologies using thermal treatment of waste to recover energy.

The policy includes a simplified set of requirements for facilities recovering energy from 'eligible waste fuels', which have been deemed to pose a low risk due to their origin, composition and consistency. The WSERRC proposal will recover energy from the residual fraction of mixed municipal solid waste (MSW) and commercial and industrial (C&I) waste, which is not an eligible waste fuel, so the comprehensive policy requirements apply to the WSERRC proposal.

The NSW EfW policy describes facilities within the scope of the policy as 'energy recovery facilities.' This term is interchangeable with 'energy-from-waste facility' in the context of the WSERRC assessment.

The NSW EfW policy recognises that energy recovery is a valid pathway for managing residual waste in circumstances where higher-order material recovery is not possible. It reflects the environmental and human health protection objectives of the *Protection of the Environment Operations Act 1997* and the resource management objectives of the *Waste Avoidance and Resource Recovery Act 2001*. It aims to uphold the following main principles:

- Higher value resource recovery outcomes are maximised.
- Air quality and human health are protected.
- 'Mass burn' disposal outcomes are avoided.
- Scope is provided for industry innovation.

Figure 5.5 explains Cleanaway's approach to supporting optimum resource recovery outcomes at every level of the waste hierarchy.

The NSW EfW policy sets requirements for a range of issues which are relevant to energy recovery proposals and in doing so helps the development of appropriate infrastructure for New South Wales. **Table 5.1** presents the requirements of the NSW EfW policy and demonstrates how they have been addressed in the WSERRC proposal.

Table 5.1: Summary of NSW EfW policy requirements and WSERRC compliance

NSW EfW policy requirements	WSERRC approach	Compliance status
Public consultation and the good neighbour principle		
Offer effective information and public consultation and engage in genuine dialogue with the community.	The development of the WSERRC proposal has been informed by a comprehensive approach to community and stakeholder engagement. Community and stakeholder engagement for the proposal started early and continued regularly throughout the EIS process. Early community research was conducted to understand their issues, ideas, and sentiment and to find out their preferences for how they wanted to be engaged on the proposal. The findings from this research have been applied throughout the community engagement strategy which in turn informed the proposal. For example, understanding that air emissions are a very high priority for the community, the WSERRC proposal has chosen to use a wet scrubber which is a sophisticated flue gas treatment technology able to clean the flue gases to a level that surpasses regulatory requirements and adheres to best-practice standards. During consultation with the community, comments were received around the impact of the proposal on air quality and human health, including requests for additional information. This led to the formation of the Air and Health Citizens Panel with four sessions held. The Air and Health Citizens Panel sessions opened opportunity to engage with the community on an issue that needs a lengthy and detailed conversation and studied the community's response to the air quality and health assessment methods (for example, did they feel it was adequate?). Further details on the Air and Health Citizens Panel sessions can be found in Section 3.5.6 of **Appendix F Community and Stakeholder Engagement Report**. Engagement activities aimed to raise awareness about EfW and its widespread use in recognised waste management systems overseas, as well as discuss the benefits of EfW diverting waste from landfill and recovering valuable resources including metals and ash. Engagement will continue following lodgement of the EIS. If approved, engagement will continue throughout construction, operation and for the life of the proposal with the visitor and education centre, playing a vital role in offering information on the role of EfW in managing waste as part of an integrated waste management strategy and where visitors can learn about waste avoidance, best-practice recycling and the circular economy.	Compliant

NSW EfW policy requirements	WSERRC approach	Compliance status
	Further, a community reference group (CRG) will be formed who, among other duties, will be responsible for administering a community funding package. The funding package would be designed to invest in infrastructure for Western Sydney and give back to those residents closest to the facility. The areas for investment would include projects to solve issues in urban heating, sporting infrastructure and community recreation. Community and stakeholder engagement is covered in **Chapter 6 Engagement** and **Appendix F Community and stakeholder engagement assessment**. Information about the proposal, contact details and information about public consultation events is available online at energyandresourcecentre.com.au	
Give approvals authorities accurate and reliable information	This EIS offers a significant body of reliable technical information and involved direct consultation with government agencies. Engagement with government agencies has been ongoing since the conception of the proposal. Results of meetings with all stakeholders are included in Section 4 of **Appendix F Community and stakeholder engagement assessment**. A summary of the main issues raised by government agencies and where the EIS responds to these issues is available in **Table 6.3** of **Chapter 6 Engagement**.	Compliant
Operate as a 'good neighbour' to nearby residences or workplaces, for example by controlling operational traffic and odour impacts.	The proposal site was carefully selected as the preferred site following a detailed and systematic site screening analysis completed between July 2018 and October 2019. The site screening analysis was based on a set of selection criteria to find potential sites in the wider Sydney region that would be suited to the development of an EfW facility. The sites location in the Wallgrove Precinct of the Western Sydney Parklands was favourable due to the site being previously used for industrial purposes and the industrial and commercial nature of the surrounding land uses. Further, the site would avoid existing and planned residential areas, rural land uses and future airspace restrictions. The site was preferable from an air quality perspective as its distance from sensitive residential and other receptor locations contribute to its ability to manage emissions within air quality criteria. The closest residential areas are around 1km to the south of the site with Erskine Park residential area located around 3.5km to the west and Minchinbury located around 3km to the north. Horsley Park Public School is located over 2km south of the site and a childcare centre is located within the Eastern Creek industrial area about 1km to the west of the site.	Compliant

NSW EfW policy requirements	WSERRC approach	Compliance status
	Of all the possible available locations for an EfW facility that were assessed in detail during the site selection process, this location resulted in the least impact in terms of population exposure. The site's location next to transport infrastructure such as the M7 Motorway and Wallgrove Road was also favourable as it allows for convenient road transport access routes and minimises the possible effects on nearby receivers from site truck traffic. The site has also been designed to accommodate all parking demand from the proposal. Refer to **Chapter 15 Traffic and transport.** The good neighbour principle is also enabled through the design embedded mitigation measures for the facility. Among others, these include an enclosed waste receiving hall kept under negative pressure which will prevent odour escape and flue gas monitoring system to make sure the facility is compliant with statutory emissions limits. The proposal has been designed to minimise impacts on viewpoints. See **Chapter 16 Landscape and visual** and **Appendix B Architecture and Landscape Design Strategy Report**. Impact on residential amenity is assessed throughout the impact assessment section, refer to **Chapter 8 Air quality and odour, Chapter 13 Noise and vibration, Chapter 16 Landscape and visual** and **Chapter 17 Social.** Specific public and stakeholder interests were recognised through a comprehensive community and stakeholder engagement strategy (**Chapter 6 Engagement**), including how these interests have been considered in the EIS. Engagement has been conducted with all neighbours and many stakeholders in the Western Sydney Parklands, as well as the industrial estate on the western side of the M7, the Little Graces Childcare Centre and Sydney Zoo. Further, a suitable operator with experience in managing an EfW facility and complying with relevant environmental regulations will be appointed to partner with Cleanaway to operate the proposal. The selected operator will need to demonstrate that they are eligible to hold an EPL, having regard to the requirements of the *Protection of the Environment Operations Act 1997* (POEO Act). The operator will also be needed to operate the proposal in line with Cleanaway's Environmental Policy and independently certified ISO 14001 Environmental Management System, reflecting Cleanaway's commitment to achieving a high level of environmental performance at its facilities.	

NSW EfW policy requirements	WSERRC approach	Compliance status
Offer readily available information about operational performance, including air emissions and resource recovery outcomes.	The WSERRC will comply with all the reporting criteria of its operating licence. This is expected to include publication of air emissions and resource recovery information. A Continuous Emissions Monitoring System (CEMS) will be employed to continually monitor flue gases so that the facility is compliant with statutory emissions limits. This data will be made available to the EPA in a real-time graphical publication. A regular summary of continuous monitoring data and compliance with emissions limits will be published on the Western Sydney Energy and Resource Recovery Centre website.	Compliant
Demonstrating best practice		
Demonstrate use of current international best practice techniques, particularly regarding: • Process design and control • Emission control equipment design and control emission monitoring with real-time feedback to the controls of the process • Arrangements for the receipt of waste • Management of residues from the energy recovery process.	The European legislative framework for industrial facilities defines the concept of Best Available Technique (BAT) to inform facility performance requirements. These are detailed in the relevant Best Available Techniques Reference Document (BREF), developed by the research institute of the European Commission. Combustion gases created through the combustion of waste must be cleaned before released from the stack. This facility will be capable of cleaning the flue gases in line with the emissions limits as set out in the Industrial Emissions Directive (IED) and the associated BREF) document for waste incineration as published on 3 December 2019. Further technical detail can be found in **Technical report D Best Available Techniques Assessment Report**. The EU Commission Implementing Decision (2019/2010) of the 12 November 2019 states the best available techniques (BAT) conclusions as the main element of the BREF and prescribes them to be adopted by Member States. The WSERRC proposal has been assessed against the BREF-WI 2019 and found to be compliant against all relevant criteria.	Compliant
Demonstrate that the proposed technology can handle the expected variability and type of waste feedstock referring to fully operational reference facilities using the same technologies	Two reference facilities have been selected (Dublin, Ireland and Filborna, Sweden). These facilities both operate under the European legislative framework. They process similar waste streams, derived from a mixture of MSW and C&I waste feedstocks, and use the same flue gas treatment process as the WSERRC proposal. Air emission data from the reference facilities shows that they perform well below both the NSW and EU emission limit values for all regulated pollutants (see **Section 5.10).**	Compliant

NSW EfW policy requirements	WSERRC approach	Compliance status
and treating like waste streams in similar jurisdictions.	Cleanaway has conducted multiple audits of MSW and C&I residual waste to build an understanding of the expected variability in feedstock, which remains well within the operational capability of the proposed technology. A summary of the Waste audit data can be found in **Technical report C Waste and Resource Management Assessment.**	
Technical criteria		
Complete combustion: • The gas resulting from the process should be raised, after the last injection of combustion air, in a controlled and homogenous fashion and even under the most unfavourable conditions to a minimum temperature of 850°C for at least 2 seconds (as measured near the inner wall or at another representative point of the combustion chamber). • If a waste has a content of more than 1% of halogenated organic substances, expressed as chlorine, the temperature should be raised to 1100°C for at least 2 seconds after the last injection of air. • The total organic carbon (TOC) or loss on ignition (LOI) content of the slag and bottom ashes must not be greater than 3% or 5%, respectively, of the dry weight of the material.	The NSW technical criteria for complete combustion are nearly identical to criteria for complete combustion within the European legislative framework for incineration facilities and are readily achievable using the proposed technology. Complete combustion of gases is detailed in **Section 3.4.11** of **Chapter 3 Proposal description.** The technology proposed at WSERRC is mature and well-proven. Reference facilities have been selected which operate on similar waste feedstocks using similar technology and comply with requirements for complete combustion and emissions to air. Waste auditing and laboratory testing of waste received at the Cleanaway Erskine Park waste transfer station indicates that the chlorine content of waste feedstock will have less than 1% halogenated organic substances, expressed as chlorine, so a minimum temperature of 850°C is appropriate. Chlorine content is detailed in Section 3.6.1 of **Technical report C Waste and Resource Management Assessment**. Design criteria on maximum unburnt content in IBA (TOC and LOI) will be included in the design performance requirements for the technology provider and the required limits are readily achieved with the proposed technology. The WSERCC proposal is being designed to meet BREF-WI, which includes these conditions on TOC and LOI (see **Chapter 3 Proposal description** and **Technical report D Best Available Techniques Assessment Report.**). Other European facilities, including the reference facilities used for this proposal, readily meet these conditions as prescribed in BREF-WI. For further details, refer to BAT 14 within **Technical report D Best Available Techniques Assessment Report**.	Compliant

NSW EfW policy requirements	WSERRC approach	Compliance status
Air emissions: • The process and air emissions from the facility must satisfy at a minimum the requirements of the Group 6 emission standards within the *Protection of the Environment Operations (Clean Air) Regulation 2010.*	Two reference EfW facilities have been selected (Dublin, Ireland and Filborna, Sweden). These facilities both operate under the European legislative framework. They process similar waste streams, derived from a mixture of MSW and C&I waste feedstocks, and use the same flue gas treatment process as the WSERRC proposal. Refer to **Section 5.9** below for details. Air emission data from the reference facilities shows that they perform well below both the NSW and EU emission limit values for all regulated pollutants (see **Section 5.10**).	Compliant
Operational monitoring and reporting: • There must be continuous measurements of NO_x, CO, particles (total), total organic compounds, HCl, HF and SO_2. • This data must be made available to the EPA in real-time graphical publication and a weekly summary of continuous monitoring data and compliance with emissions limits published on the internet. The continuous measurement of HF may be omitted if treatment stages for HCl are used which ensure that the emission limit value for HCl is not being exceeded.	Each operating line will be equipped with a continuous emissions monitoring system (CEMS) which will allow continuous online monitoring. The CEMS will be compliant with the BREF-WI document and will be used to make automatic adjustments to the flue gas treatment system. The CEMS will continuously monitor: • Oxides of nitrogen (NO_x) • Carbon monoxide (CO) • Particulates (dust) • Total Volatile Organic Compounds (TVOCs) • Hydrogen chloride (HCl) • Hydrogen fluoride (HF) if needed by licencing conditions. However, reference facility data indicates that HCl emissions are typically 1/100 of the EU IED limit and 1/1000 of the NSW POEO emissions limit value • Sulphur dioxide (SO_2) • Ammonia (NH_3) • Mercury (Hg) • Flue gas flow rate • Temperature • Pressure • Moisture content • Oxygen • Carbon dioxide.	Compliant

NSW EfW policy requirements	WSERRC approach	Compliance status
• There must be continuous measurements of the following operational parameters: ◦ Temperature at a representative point in the combustion chamber ◦ Concentration of oxygen ◦ Pressure and temperature in the stack, and ◦ Water vapour content of the exhaust gas. • This must be conducted and held by the proponent for a period of three years • Following successful proof of performance trials, there must be at least two measurements per year of heavy metals, polycyclic aromatic hydrocarbons, and chlorinated dioxins and furans. One measurement at least every three months shall be carried out for the first 12 months of operation. If and when appropriate measurement techniques are available, continuous monitoring of these pollutants will be necessary.	Operational data will be recorded, stored, reported to the EPA and published in compliance with the facility Environment Protection Licence (EPL) conditions. Periodic monitoring of additional pollutants including heavy metals, polycyclic aromatic hydrocarbons, and chlorinated dioxins and furans will be conducted and reported according to the facility EPL conditions. Refer to BAT 3 and BAT 4 within **Technical report D Best Available Techniques Assessment Report**. Complete combustion of solid waste is detailed in **Section 3.4.10** of **Chapter 3 Proposal description**.	

NSW EfW policy requirements	WSERRC approach	Compliance status
Waste feed interlocks are needed to prevent waste from being fed to the facility when the necessary temperature has not been reached either at start-up or during operation.	The boiler will be equipped with waste feed interlocks to prevent feeding of waste when the boiler temperature is too low to enable complete combustion. Diesel-fuelled auxiliary burners will raise the boiler temperature during start-up and will also be able to raise the temperature, if necessary, during operations. Boilers, superheaters and economisers are discussed in **Section 3.4.11 Chapter 3 Proposal description.**	Compliant
Air quality impact must be assessed in line with the Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales.	An air quality and odour impact assessment (AQOIA) has been prepared and is included as **Technical Report A**. The AQOIA has been prepared in line with the NSW Environment Protection Authority (EPA) document Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (NSW EPA, 2017) referred to in the *Protection of the Environment Operations (Clean Air) Regulation 2010*. A summary of this report is available in **Chapter 8 Air quality and odour**.	Compliant
Thermal efficiency		
At least 25% of the energy generated from the thermal treatment of the material will be captured as electricity (or an equivalent level of recovery for facilities generating heat alone).	The proposal will achieve a gross electrical efficiency of >25% for compliance with the policy. Over and above the policy requirement, the proposal expects to achieve a significantly higher efficiency of 30.5% (gross) subject to finalisation during the detailed design phase of the proposal. Refer to **Section 3.4.12** of **Chapter 3 Proposal description**.	Compliant
Any heat generated by the thermal processing of waste is recovered as far as practicable, including use of waste heat for steam or electricity generation or for process heating of combined heat and power schemes.	The WSERRC proposal is designed to be capable of operating either in electricity only mode or combined heat and power mode. Refer to **Section 3.4.13** of **Chapter 3 Proposal description**. Initially it will operate in electricity-only mode, but a turbine connection will be installed to allow flexibility for future heat offtake, should opportunities arise to offer steam to nearby industrial areas for direct use or use in absorption cooling. The WSERRC proposal is currently exploring potential heat usage with industrial facilities near the site.	Compliant

NSW EfW policy requirements	WSERRC approach	Compliance status
Resource recovery criteria		
Energy recovery from residual waste must complement material recovery, aligned to principles set out in the POEO Act and the WaRR Act and support the NSW EPA objectives to: • Promote the source separation of waste where technically and economically achievable • Push the use of best practice material recovery processes • Support bona-fide resource recovery operations. This can be achieved through compliance with Table 1 of the NSW EfW policy, or an alternative feedstock strategy considered and agreed in consultation with the NSW EPA.	The WSERRC proposal will support the core principle of the waste hierarchy, which underpins the WaRR Act. **Chapter 2 Strategic context** describes how the proposal supports the strategic outcomes recognised in relevant Government waste, energy and land use policies, strategies and plans and specifically sets out the WARR Acts main objectives relevant to the proposal and how the WSERRC meets these objectives. The WSERRC proposal is to recover energy from residual waste that would otherwise have been landfilled and is an appropriate and complementary option within the wider waste management and resource recovery system. The proposal has the flexibility to accommodate improvements in resource recovery and changes in feedstock over time. The waste feedstock strategy targets residual waste from councils and businesses which have source-separation systems for high quality recycling. Waste from sources without adequate source separation will be processed to recover materials of value for recycling. Further details can be found in **Section 5.4 Proposed feedstock strategy** and **Section 5.6 Feedstock eligibility and compliance with the NSW EfW policy**, with supporting calculations provided in **Technical report C Waste and Resource Management Assessment**. The WSERRC proposal will receive residual waste feedstock that will have either undergone processing or will be sourced from fully segregated kerbside collection systems and businesses with source-separation systems in place. Genuine resource recovery at the levels specified in Table 1 of the NSW EfW policy is not considered technically and economically achievable in the context of current regulatory restrictions on the use of organics recovered from mixed waste and restrictions on the export of mixed or contaminated materials for recycling. While pre-processing can be carried out to meet the Table 1 eligibility limits on waste to energy recovery, in the current context this pre-processing stage would produce significant quantities of contaminated residual material with no market outlet, which would need to be directed to landfill disposal. Landfill is a less desirable option than energy recovery under the waste hierarchy.	Compliant

NSW EfW policy requirements	WSERRC approach	Compliance status
	The WSERRC proposal presents a feedstock strategy which is compliant with Table 1 of the NSW EfW policy. The strategy includes pre-processing of waste at Cleanaway's Erskine Park transfer station and active promotion and support for source separation by waste generators. However, it also includes landfilling of mixed and contaminated waste after pre-processing, in order to satisfy the eligibility limits on EfW feedstock in Table 1 of the NSW EfW policy. While the proposal demonstrates compliance with the resource recovery criteria, the applicant is seeking an increase to the maximum allowable percentage of residuals from pre-processing facilities receiving mixed MSW and mixed C&I waste under Table 1 of the NSW EPA EfW policy. This would allow the mixed and contaminated residual component which has no outlet under current market and regulatory conditions to be directed to energy recovery rather than landfill. It would also improve overall landfill diversion without undermining the recovery of valuable materials with a genuine market outlet, given that the processing facility will use best available technologies for material recovery. Overall, less mixed waste feedstock would need to be directed through the pre-processing facility, potentially allowing more space for other resource recovery operations at this site and supporting competition in the putrescible waste management market. Reliance on increase to the maximum allowable percentage of residuals from processing facilities is expected to decrease over time as both council and business waste generators move towards greater source-separation. WSERRC is actively promoting source separation of food and garden waste with Western Sydney councils. WSERRC and Cleanaway will actively support the transition to FOGO with councils by investing in the necessary processing facilities as needed, and also in the education of the community which is critical to a successful transition and achieving low contamination rates.	

5.3 Policy context

Policy context and requirements are discussed in detail in **Technical report C Waste and Resource Management Assessment**.

The main federal and NSW waste and resource recovery policy context for the WSERRC proposal includes:

- Federal policy announcements, including the National Waste Policy Action Plan 2019 and an intended ban on export of waste materials started to be phased in during 2020. This reflects the disruption to recycling supply chains since 2018 and a growing sense of responsibility for ensuring an environmentally sound fate for Australia's waste. EfW can offer an onshore pathway to manage non-recyclable and challenging-to-recycle wastes and result in a higher-order outcome for waste which would otherwise have been landfilled. The WSERRC proposal has flexibility to accommodate changes in feedstock as domestic recycling capacity and markets for recycled material are developed.
- The NSW EPA Mixed Waste Organic Output (MWOO) Position Statement released in 2018 and reaffirmed in 2019 effectively ended the role of mixed waste sorting for organics recovery in New South Wales. Adoption of food and garden organics (FOGO) source separation complemented by energy recovery from residual waste is an option which would offer excellent landfill diversion rates and acceptable recovery of organic waste in the context of the MWOO Position Statement.
- The NSW 2014 to 2021 Waste Avoidance and Resource Recovery Strategy (WARR Strategy) is based on the principle of the waste hierarchy and sets recycling and landfill diversion targets. The WSERRC proposal, scale and feedstock strategy is consistent with the objectives and targets of the WARR Strategy. Energy recovery can contribute to landfill diversion targets, while metals recovery from pre-processing of waste feedstock and metal recovery from IBA can make a minor contribution to recycling targets. The proposed recycling of the non-metal portion of IBA into construction applications would significantly increase the WSERRC contribution to recycling targets.
- The NSW EPA is developing a 20 Year Waste Strategy, which will replace the WARR Strategy 2014–2021. The new strategy may introduce different target or priority actions. However, the core principle of the waste hierarchy is enshrined in the overarching legislation and will continue to guide NSW EPA in its approach to resource management and landfill diversion. An issues paper was released for consultation in March 2020.

The issues paper recognises that New South Wales currently has a shortfall in resource recovery capacity for both organics recovery and recycling of materials which were previously exported and proposes various options to push improvement.

This is consistent with the WSERRC feedstock strategy and modelling, which allows for significant improvements in separation of household organics and source separation by businesses by 2035. As source separation and recycling improves over time, the WSERRC proposal has flexibility to accommodate changes in feedstock and continue providing landfill diversion for residual waste.

5.4 Proposed feedstock strategy

The WSERRC feedstock strategy is to target waste from source-separated sources where possible and process waste from sources without adequate source separation to recover materials for which a viable recycling outlet is available. This approach respects the waste hierarchy, maximises resource recovery for high-quality recycling and enables the proposal to demonstrate compliance with the NSW EfW policy.

All waste deliveries will come from suppliers approved by the WSERRC. This means that all suppliers will have to pre-qualify before they can enter the site.

Unacceptable waste will be excluded through waste acceptance criteria within the pre-qualification process and contractual agreements with waste suppliers (refer to **Section 5.8**).

The WSERRC proposes to primarily accept residual waste from businesses (C&I waste stream) and household waste collections (MSW waste stream) in the Sydney Basin area. The design capacity of the facility is 500,000tpa of residual waste feedstock. Waste feedstock availability and likely changes over time due to policy, demographic and economic factors have been modelled and reported. Details are available in **Technical report E Waste Flow Analysis for Greater Sydney**. Based on this modelling, the WSERRC proposal has developed a feedstock strategy which accommodates greater uptake of source separation over time, particularly for organics. Source separation is the most desirable outcome as it secures high-quality material streams for recycling and reduces the need for less-efficient processing of mixed residual waste. Waste from collection systems without adequate source separation will be processed to recover valuable recyclables before energy recovery.

Cleanaway is seeking approval from the NSW EPA for an increase to the maximum allowable percentage of residual waste from processing facilities receiving mixed MSW and mixed C&I waste, as allowed under Note 1 to Table 1 of the NSW EfW policy. This reflects changes in recycling markets and regulation since the NSW EfW policy was originally published in 2015.

The processing would be in line with best-practice recovery performance and is likely to be carried out at facilities such as Cleanaway's Erskine Park Waste Transfer Station which may trigger the need to increase the approved capacity at this facility (or other similar facilities). A processing facility is considered related development and is discussed further in **Chapter 22 Related development**.

5.4.1 Short-term feedstock strategy

Councils are being actively engaged on the role of EfW and the WSERRC but waste supply contracts for MSW have not yet been confirmed. Cleanaway currently collects C&I waste which could be directed to energy recovery. Waste supply agreements with councils and other waste collection companies will be negotiated once development consent is secured. In the short term, the proposal's feedstock mix is expected to include:

- A higher proportion of C&I waste, towards the upper end of the target 50–70% range.
- About 60% of C&I feedstock received from business with source-separation of recyclable material. This residual waste is fully eligible for energy recovery.
- The remaining 40% of C&I feedstock will need additional processing before use in energy recovery. This waste will need processing at a facility such as the Erskine Park Waste Transfer Station or other similar facilities to recover valuable materials including metals and rigid plastics. This will aim to achieve about 5% recycling rate of input waste from sources without source separation.
- Less than 50% of waste feedstock will be sourced from MSW residual. Multiple councils within the Sydney basin are expected to have started a FOGO service by 2025. Contracts with these councils will be pursued in preference to other councils but if this cannot be secured, MSW will be pre-processed at a facility such as the Erskine Park Waste Transfer Station or another similar facility.
- Some metals within residual waste from source separating collections (which does not undergo processing) will be recovered from IBA in both onsite and offsite ash handling processes.

5.4.2 Long-term feedstock strategy

Over the long term, the waste supply strategy will change due to expected changes in source separation and recycling practices, and renegotiation of contracts.
By 2035, the WSERRC feedstock supply strategy is based on:

- Most councils expected to have transitioned to a 3-bin FOGO kerbside collection system meaning residual waste can be directed to EfW without initial processing. It is the intention of the proposal to source MSW feedstock primarily from councils that have implemented a FOGO kerbside collection service.
- Up to 60% of waste sourced from councils with 3-bin FOGO collections with no processing before transport to the WSERRC.
- Prevalence of source separation by business improves as the financial and environmental benefits of EfW over landfill become recognised.
  The WSERRC will preferentially seek contracts with source separating businesses. Residual waste from source-separating collections will not undergo processing prior to being delivered at the WSERRC. Any metals in this residual waste stream will be recovered from the IBA in both onsite and offsite ash handling processes.

5.5 Feedstock modelling

The feedstock modelling considers a variety of plausible changes over time, including the degree of FOGO uptake by Councils, the prevalence of source separation of waste by businesses, MSW waste generation per capita and C&I waste generation per employee. A summary is included in **Technical report C Waste and Resource Management Assessment** and the full modelling report is available in **Technical report E Waste Flow Analysis for Greater Sydney**.

Two main modelling results are presented across the MSW and C&I waste streams. The first estimates the quantity of residual waste arising from collection systems that have source separation and are 100% eligible for energy recovery under the NSW EfW policy. The second estimates residual waste arising from collection systems that would need processing before being eligible for energy recovery under the NSW EfW policy.

The total of these two results represents the total potential available feedstock to the WSERRC proposal. Estimated quantities of available residual waste from MSW and C&I streams over the operational life of the WSERRC (at 5 year intervals) are summarised in **Table 5.2** and **Table 5.3** respectively.

The results demonstrate that there is significantly more waste available in the Sydney Basin than the 500,000tpa design capacity of the WSERRC proposal.

These modelling results indicate that the Sydney Basin will generate enough residual waste to support the WSERRC and other known EfW facilities proposed in the Sydney Basin, while increasing source separation, recycling and landfill diversion. In this context, the WSERRC proposal has significant flexibility to secure waste from both MSW and C&I sources to achieve optimum commercial and energy recovery outcomes.

Table 5.2 Estimated residual MSW arising in the Greater Sydney region (tpa)[1]

Sydney basin residual waste	2020	2025	2030	2035	2040	2045	2050
Arising from a FOGO collection system	125,460	471,205	711,062	1,253,681	1,572,625	1,691,901	1,799,523
Arising from a collection system that will need processing[2]	1,276,072	970,085	789,586	266,758	14,216	0	0
Total residual waste	1,401,532	1,441,290	1,500,648	1,520,439	1,586,841	1,691,901	1,799,523

Table 5.3 Estimated residual C&I waste arising in the Greater Sydney region (tpa)[3]

Sydney basin residual waste	2020	2025	2030	2035	2040	2045	2050
Arising from a comprehensive source separation system	775,735	807,086	1,054,503	1,134,451	1,215,446	1,293,954	1,370,069
Arising from a collection system that will need processing	517,156	538,056	351,500	378,150	405,150	431,378	456,690
Total residual waste[4]	1,292,891	1,345,142	1,406,003	1,512,601	1,620,596	1,725,332	1,826,759

[1] Refer to Technical report E: Waste Flow Analysis for Greater Sydney for further information
[2] Note that this total available feedstock tonnage is back-calculated based on the tonnages arising from different kerbside collection systems, as modelled by Arcadis and presented in Table 10 of Technical report E: Waste Flow Analysis for Greater Sydney. The value presented here reflects the total residual waste tonnage arising, prior to the application of eligibility limits under NSW EfW policy.
[3] Refer to Technical report E: Waste Flow Analysis for Greater Sydney for further information
[4] Note also that the 'MSW Residual Generation' headline figure shown in Table 10 of Technical report E: Waste Flow Analysis for Greater Sydney is modelled based on population growth without FOGO uptake, and consequently indicates a higher residual waste availability. This was not adopted for feedstock modelling, as source separation is key to the WSERRC feedstock strategy and the applicant is working proactively with councils to encourage and support FOGO transition through their wider collections and resource recovery business.

5.6 Feedstock eligibility and compliance with the NSW EfW policy

Feedstock modelling indicates that there is ample feedstock available to meet WSERRC requirements, maintain competition in the putrescible waste market, and allow flexibility for changes in waste management and resource recovery in the future.

The WSERRC is designed to accept 500,000tpa of waste feedstock for energy recovery. The total tonnage of waste which the applicant will need to secure to meet this feedstock requirement depends on the level of source separation undertaken by contracted waste generators and eligibility conditions under the NSW EfW policy.

The proposal will accept waste from multiple generators, including both MSW and C&I waste collections. The precise sources of waste, including level of source separation cannot be confirmed until contracts are in place. However, the proposal has developed a feedstock strategy which guides the approach to seeking and negotiating feedstock contracts.

5.6.1 Source separation for high quality recycling

The first priority of the waste feedstock strategy is to target residual waste from councils and businesses which have source-separation systems in place. Source separation is the most effective way to capture clean streams of recoverable materials for high-quality recycling. Table 1 of the NSW EfW policy allows energy recovery of 100% of the residual waste from councils with 3-bin FOGO collection and businesses with source separation in place for all relevant waste stream. This recognises that source separation is the best approach to separating recyclable material from residual waste, and the WSERRC proposal aligns to this philosophy.

5.6.2 Processing for recycling

The second priority of the waste feedstock strategy is to recover valuable materials from mixed waste for recycling. Waste from collection systems without adequate source separation will be processed to recover valuable materials for which recycling markets exist. The processing facility is likely to be located at Cleanaway's Erskine Park Waste Transfer Station which may trigger the need to increase the approved capacity at this facility. Metals and some rigid plastic will be the main materials recovered. **Table 5.4** describes how major material streams will be recovered during pre-processing and the EfW process.

The pre-processing facility will use mechanical sorting equipment such as magnets and optical sorters to extract recyclable materials. This type of facility for mixed waste is typically referred to as a 'dirty mixed recycling facility (MRF)'. It will not include any separation or biological processing of organic materials, as organic materials from mixed waste are contaminated and have no recovery outlet under NSW regulations.

The recovery rate from this process is expected to be around 5%, based on benchmarking of similar facilities using current best-practice technology to extract valuable materials for sale. **Technical report E Waste Flow Analysis for Greater Sydney** provide further details of this benchmarking and states that the proposed sorting process and a targeted 5% recycling rate is a reasonable technically and economically feasible recovery rate in the current regulatory and market context for recovery of organics and dry recyclable materials.

The waste remaining after this pre-processing will consist of mixed and contaminated materials with no viable outlet in the context of the regulatory change in 2018 to ban organics from mixed waste from being applied to land in New South Wales, and significant tightening of contamination limits in global recycling markets, beginning with restrictions imposed by China in 2018. This material has a suitable chemical composition and calorific value for energy recovery at the WSERRC.

Table 5.4: Summary of material recovery during pre-processing and the EfW process

Material	Recovery in pre-processing and the EfW process
Metals	Both ferrous and non-ferrous metals can be recovered during pre-processing and will contribute significantly to the pre-processing recovery rate. The WSERRC will also extract ferrous metals from the IBA and will recover non-ferrous metals at a dedicated offsite IBA processing facility. The highest economic value is in the very fine non-ferrous metals, such as copper, platinum and gold. The very fine non-ferrous metals can only be recovered from the IBA after partial maturation and a screening process, which will be done offsite. Extracting the metals from the EfW IBA is the most common practice in the UK and Europe, rather than extracting the metals in a feedstock pre-processing facility. It is more efficient to extract the metals from the IBA residue because metals do not combust. Extraction from IBA can produce a higher yield and a cleaner, more marketable product. Extraction of metals only from IBA is the preferred option for waste from collections with source separation because it also saves on capex and opex in the processing facility, resulting in a potential lower cost waste solution for Councils.
Hard plastics	Hard plastics are best recycled through source separation into comingled recycling bins, or container deposit points. WSERRC will not receive these recycling streams. PET and other plastics in the mixed waste stream could be recovered during pre-processing, but would be highly contaminated, with very limited value. Pre-processing will recover some hard plastics, predominantly PET and HDPE. Most plastic received will form part of the fuel for the EfW process.

Material	Recovery in pre-processing and the EfW process
Soft plastics	Soft plastics are not suitable for recovery from residual waste and would form part of the fuel for the EfW process.
Glass	Glass is generally source-separated in comingled recycling bins or container deposit points. The WSERRC will not receive these recycling streams. Glass in residual waste bins is usually broken, contaminated and unsuitable for recovery. It would be processed through the EfW process and form part of the IBA residue. IBA is inert and has excellent engineering properties in unbound pavements. It is regularly used as a construction material in the EU and UK. Options for the offsite recovery and reuse of IBA from the combustion process are also being investigated, building on knowledge and practice elsewhere, and working with industry partners to investigate the feasibility of developing a market for reuse of IBA in construction products.
Paper and cardboard	Paper and cardboard received will be recovered during pre-processing and sold to recyclers. It is in economic interest of the pre-processing facility operator to recover any marketable recyclables given the value in its sale. However, paper and cardboard which has been mixed with organic waste (MSW red bin waste) is highly contaminated and has no value. It will form part of the fuel for the EfW process, and this fraction of the fuel will generate renewable energy.
Organics (food and garden)	Organics recovered from mixed waste are no longer allowed to be applied to land, following the 2018 NSW EPA MWOO Position Statement. There is no recycling outlet for this material once it is contaminated with other waste in a mixed collection. Cleanaway will work with councils and business customers to support uptake of source-separated collections for food and garden organics. All organic material received will form part of the fuel mix for the EfW process, and this fraction of the fuel will generate renewable energy.

5.6.3 Feedstock strategy Scenario 1

Residual waste after processing will either be directed to WSERRC as feedstock for energy recovery, or landfilled, as no higher-order outlet is available.
The WSERRC proposal has considered two scenarios regarding EfW-eligibility of this material under the NSW EfW policy.

Feedstock strategy Scenario 1 is consistent with Table 1 of the NSW EfW policy.

Residual mixed waste from source separated business collection and councils operating a 3-bin FOGO kerbside collection service are 100% eligible for energy recovery and will be directed to WSERRC without any initial processing.

Waste from a collection system without adequate source separation will be directed to a processing facility. After waste is processed to extract and recycle valuable materials, mixed residual waste would be directed either to energy recovery at the WSERRC or to landfill, with no further processing undertaken for either stream. The maximum quantity of waste eligible under Table 1 of the NSW EfW policy would be directed to the WSERRC for energy recovery. The remaining waste would be directed to landfill disposal, as no other higher-order outlet is available. Scenario 1 is summarised in **Figure 5.2**.

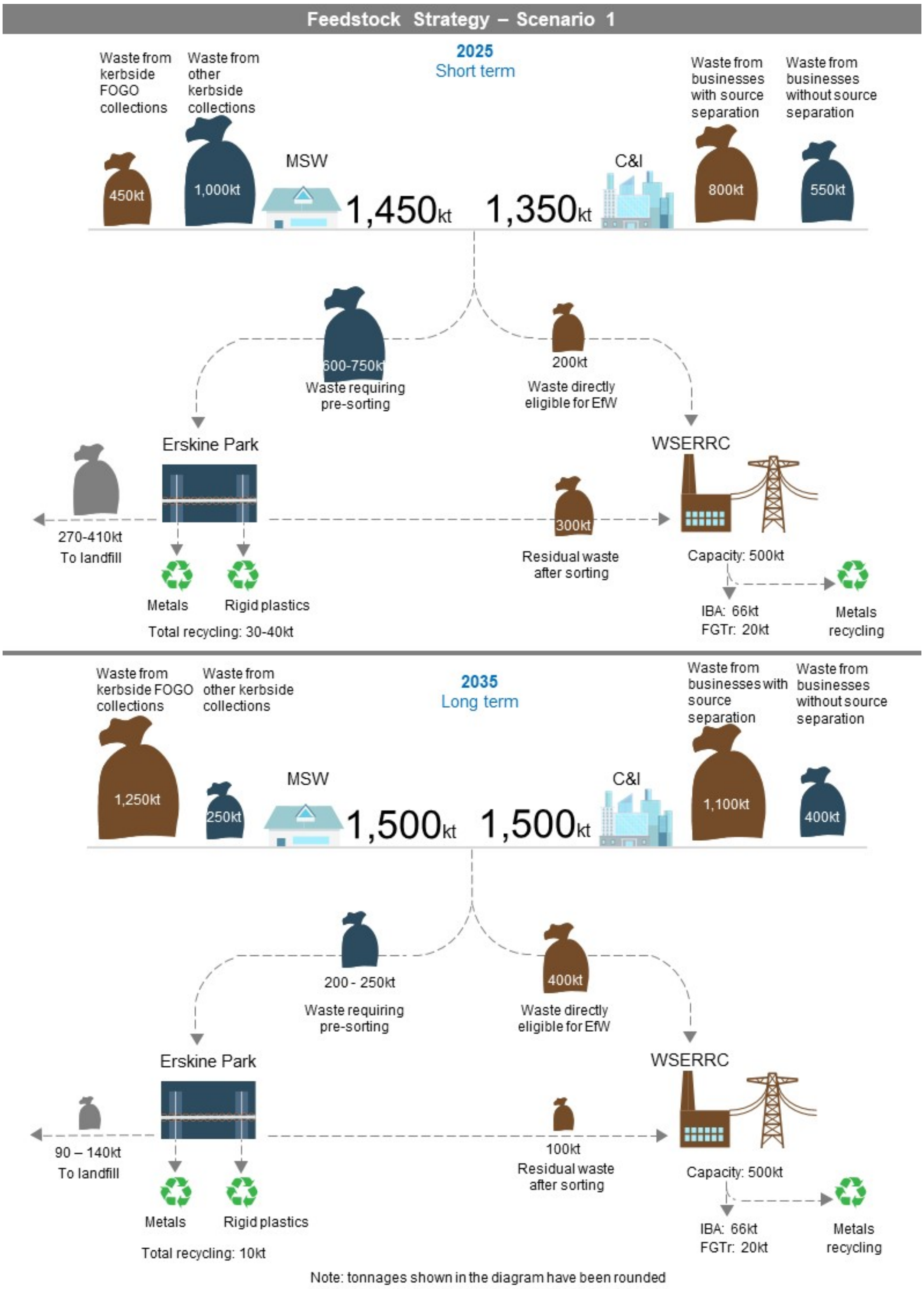


Figure 5.2: WSERRC proposed short-term and long-term feedstock strategy Scenario 1.[5]

[5] Based on waste availability modelling, consistent with Scenario 1: Application of Resource Recovery Criteria as defined in Table 1 of the NSW EfW policy A calculation sheet explaining the sources and assumptions for each of the waste flows is provided in Technical Report C Waste and Resource Management Assessment.

5.6.4 Feedstock strategy Scenario 2

Residual waste after processing will either be directed to the WSERRC as feedstock for energy recovery, or landfilled, as no higher-order outlet is available. The WSERRC has considered two scenarios regarding EfW-eligibility of this material under the NSW EfW policy.

Feedstock strategy Scenario 2 is consistent with the NSW EfW policy. It meets the requirements of Table 1 for waste for source separated collections and reflects an approval from the NSW EPA to increase the allowable percentage of mixed residual waste which is eligible for energy recovery after processing. Note 1 to Table 1 of the NSW EfW policy states:

'The EPA may give consideration to increases to the maximum allowable percentage of residuals from facilities receiving mixed municipal and commercial and industrial waste where a facility intends to use the biomass component from that process for energy recovery, rather than land application and the facility can demonstrate they are using best available technologies for material recovery of that stream.'

This provision within the NSW EfW policy allows flexibility to accommodate changes such as the ban on land application of organics from mixed waste which the NSW EPA implemented in 2018 and confirmed in 2019. **Figure 5.3** illustrates how the 2018 ban on land application of organics from mixed waste has impacted the resource recovery outcomes when applying Table 1 of the NSW EfW policy to mixed putrescible waste. It focuses on MSW mixed residual waste from a 3-bin GO collection system for illustrative purposes and is not necessarily reflective of overall WSERRC feedstock.

If granted, this increase to EfW-eligibility for the processed waste stream would improve overall landfill diversion without undermining the recovery of valuable materials that have a genuine market outlet. Overall, less mixed waste feedstock would need to be directed through the pre-processing facility, potentially allowing more space for other resource recovery operations at this site and supporting competition in the putrescible waste management market.

Scenario 2 is summarised in **Figure 5.4**.

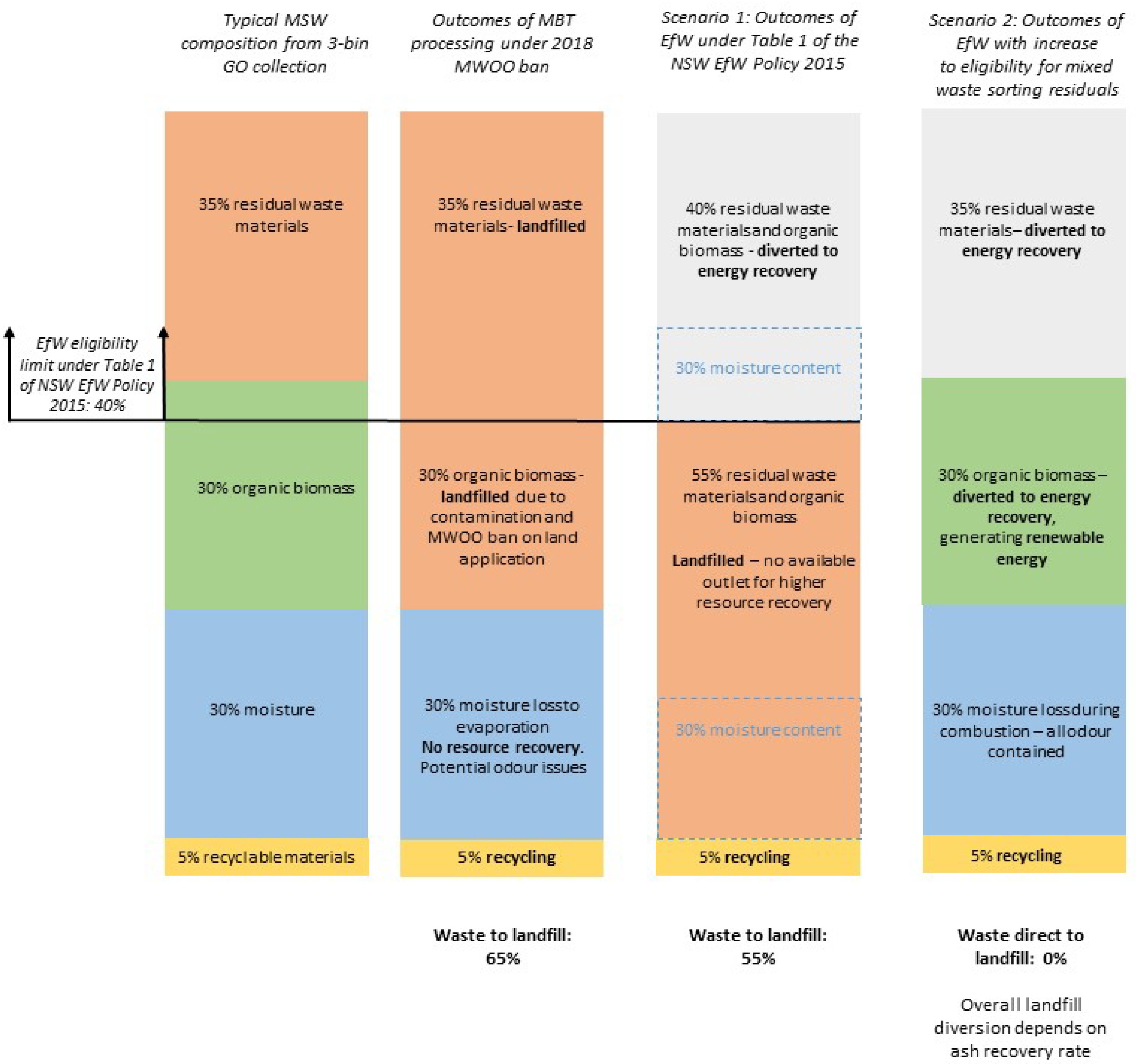


Figure 5.3: Resource recovery outcomes for mixed residual waste from a 3-bin GO kerbside collection, illustrating the impact of regulatory change on the application of the NSW EfW policy.

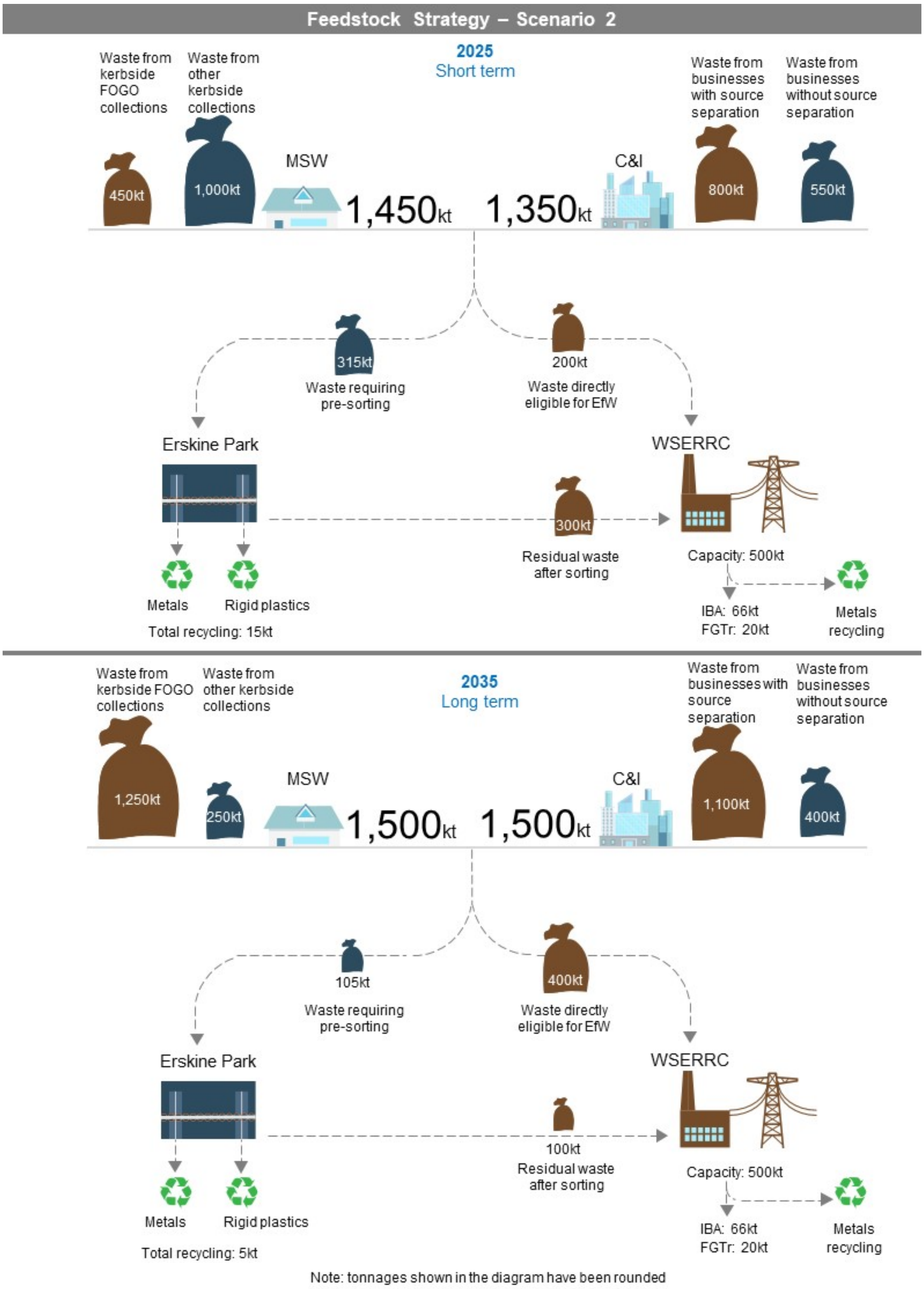


Figure 5.4: Scenario 2 WSERRC proposed short-term and long-term feedstock strategy.[6]

---

[6] Based on waste availability modelling. Scenario 2 describes an approval for 95% EfW-eligibility of mixed residual waste when directed through a processing facility to recover valuable recyclable materialsA calculation sheet explaining the sources and assumptions for each of the waste flows is provided in Technical Report C Waste and Resource Management Assessment.

5.6.5 Scenario implications

Scenario 2 would affect approximately 60% of the WSERRC target feedstock in the short term, decreasing to approximately 20% of WSERRC expected feedstock in the longer term, as both councils and businesses move towards greater source separation.

Scenario 2 would not affect the recycling rate for materials which can be mechanically extracted for recycling and have a viable market. The recycling rate for these materials, predominantly metals and some rigid plastics, is expected to be around 5% of the mixed waste stream regardless of whether or not an increase to EfW-eligibility limits is approved, as described in **Section 5.6.2** of this report. This is based on benchmarking of other facilities undertaking mechanical sorting of mixed waste, as detailed in **Technical report E Waste Flow Analysis for Greater Sydney**.

Scenario 2 would make sure that all mixed residual waste for which no higher-order resource recovery outlet is available is directed to energy recovery and diverted from landfill disposal.

In the context of the 2018 ban on land application of MWOO, Scenario 2 provides a flexible response to the prescriptive application of the resource recovery criteria to mixed putrescible waste which achieves better resource recovery and environmental outcomes in line with the waste hierarchy.

Both Scenario 1 and Scenario 2 are considered viable for the purposes of this Environmental Impact Statement (EIS), however, would have implications for the volume of waste received at a pre-processing facility. Any application to provide additional capacity at a pre-processing facility is not part of the scope of this application as described in **Chapter 22 Related development**. However, it will have no flow-on impact to either the quantity or composition of waste feedstock accepted for energy recovery at the WSERRC.

5.6.6 Supporting higher-order resource recovery

The WSERRC proposal forms part of Cleanaway's integrated suite of waste and resource management services. Cleanaway is also contributing to higher-order waste management activities, to make sure that only truly residual waste is processed at an EfW facility. **Figure 5.5** explains Cleanaway's approach to supporting optimum resource recovery outcomes at every level of the waste hierarchy.

Figure 5.5: WSERRC and Cleanaway's approach to supporting waste avoidance, reuse and recycling.

5.6.7 Role of energy from waste infrastructure

The objective of the resource recovery criteria in the NSW EfW policy is to uphold the waste hierarchy principle and ensure that energy recovery does not undermine recycling by developing excessive EfW capacity or developing facilities which do not have flexibility to accommodate future changes in waste composition.

Methods for recovering resources from mixed residual waste have been heavily impacted by the revocation of the MWOO resource recovery order and the global restriction on export of low-quality recyclables. This focus on the quality and contamination of recovered materials is expected to continue for the foreseeable future. So, the proposal does not directly compete with alternative resource recovery processes for the same mixed waste feedstock.

In this context, the main risk of energy recovery infrastructure is that contractual obligations or financial directors could motivate continued generation of non-recyclable mixed residual waste, to the detriment of alternative source separation and recovery pathways for specific materials.

However, the WSERRC feedstock strategy demonstrates a clear commitment to supporting greater uptake of source separation for recycling, and the facility is designed to accommodate changes in feedstock composition over time.

Source separation for recycling, complemented by energy recovery from residual waste is an option which offers excellent landfill diversion rates and is highly compatible with current policy directions.

5.7 Accommodating variability

The EfW facility will mix waste thoroughly in the waste bunker to homogenise the material and prevent rapid spikes in contaminant levels or changes in calorific value associated with individual loads. The facility will also vary the waste feed rate in response to calorific value in order to maintain an optimum energy input for efficient energy recovery.

In addition, over the operational life of the WSERRC, it is likely that both technical advancement and policy changes will result in changes to the residual waste stream. This will cause long-term changes to the waste mix that would be combusted. The WSERRC has been designed to be flexible to these changes.

Changes to waste composition primarily influence the overall energy content of the waste entering the facility. The firing diagram (see **Figure 3.7** of **Chapter 3 Proposal description**) has been designed to accept a variety of waste types over a range of energy contents.

The technical design of the WSERRC proposal allows the facility to operate continuously on waste with a calorific value in the range 7.7–14.3 MJ/kg. During operation, the waste feed rate is frequently adjusted to maintain an optimum energy load to the boiler for efficient power generation. As the calorific value of waste increases, the throughput decreases, while lower calorific value waste requires a higher throughput. In this way, the facility can reliably provide electricity from a range of different feedstocks.

Lab testing of subsamples from the waste audits at Erskine Park provide data to understand the expected calorific value of waste materials. This has been combined with waste composition to determine the expected calorific net value (NCV) of the waste feedstock. Benchmarking of typical NCV of wastes in other locations has also been used as a comparison to lab test results. The difference between these values reflects the inherent variability in waste materials and moisture content in tested sub-samples. The operation of the facility will adapt to the calorific value of the waste received.

As shown in **Table 5.5,** the optimum design point of a NCV of 11 MJ/kg is expected to be provided by a feedstock blend of approximately 60% C&I waste and 40% MSW in the short term. The calorific value of MSW is expected to increase over time as organic material is diverted to FOGO collections. This is consistent with the WSERRC feedstock strategy to increase the proportion of MSW over time and remains within the design NCV range.

Table 5.5: Impact of feedstock sourcing on expected calorific value

% C&I	% MSW (short-term composition)	Benchmark NCV	Lab Test NCV	Lab test NCV-long-term MSW composition
0%	100%	9.0	9.2	11.1
20%	80%	9.6	10.1	11.6
40%	60%	10.3	11.0	12.1
50%	50%	10.6	11.4	12.3
60%	40%	10.9	11.8	12.6
70%	30%	11.3	12.3	12.8
80%	20%	11.6	12.7	13.1
100%	0%	12.3	13.6	13.60

If the future waste mix changes, the facility has inherent flexibility to adapt, while continuing to deliver acceptable technical performance in complete combustion of waste and control of emissions to air.

5.8 Waste acceptance protocol

The WSERRC will implement a waste acceptance protocol to control waste feedstock acceptance through pre-qualification of suppliers, contractual arrangements and on-site Quality Assurance/Quality Control (QA/QC) procedures. These procedures will make sure that the waste feedstock composition remains well within the parameters which can be safely and reliably processed by the facility.

The purpose of this Waste Acceptance Protocol is to:

- Set out the scheduling and mechanics for the delivery of waste feedstock to the WSERRC
- Assist the operator in determining whether waste delivered to the facility is acceptable waste.

It is acknowledged that there will be reporting, and auditing requirements defined within the Conditions of Consent and the EPL for the facility.

5.8.1 Acceptable wastes

As described in detail throughout **Section 5.4,** WSERRC will accept the following waste streams:

- Residual MSW from Council sponsored collection services
- Residual C&I waste (for example from schools, offices and other businesses).

5.8.2 Unacceptable wastes

Unacceptable waste is waste that will not be accepted by the facility. Unacceptable wastes include:

- Hazardous waste, as defined by the NSW waste classification guidelines
- Medical waste
- Asbestos
- Liquid and oily wastes
- Contaminated soils
- Tyres
- Animal carcasses
- Waste with a chlorine content of greater than 1%
- Separated recyclable materials or separated FOGO waste
- Any car or industrial batteries or concentrations of disposable batteries

- Concentrations of lightbulbs or other electrical wastes
- Materials excluded from the facility by any operating license or approvals provided by a regulatory body in New South Wales
- Highly corrosive or toxic liquids or gases such as strong acids or chlorine or fluorine
- Construction and demolition (C&D) waste.

5.8.3 Contamination

Operational procedures and systems will be implemented to minimise the likelihood of unacceptable waste being received at the facility. This will include:

- Pre-qualification procedures for waste suppliers
- Pre-processing of waste from sources that have not been adequately source separated
- Periodic sampling and testing
- On site quality control and quality assurance procedures.

The nature of residual MSW and C&I waste is that it is heterogenous in composition and is reliant on human behaviour for its composition. Whilst every effort will be made to support the community on what waste should be deposited in what bin, not all contamination can practicably be removed from a heterogenous waste stream. For example, it is possible that a consignment of residual MSW could contain a single AA battery that had been disposed of incorrectly by a resident. While, every effort will be made and supported by the proposal to control the quality of the incoming waste streams, the facility has been designed and will be operated in line with international best practice. This will enable the facility to safely accommodate and manage any underlying levels of contamination in the waste feedstock. The flue gas cleaning equipment has been appropriately designed so that emissions from the thermal treatment of waste, including potential contaminants, are kept below the limits as set out in **Chapter 8 Air Quality and Odour**. EfW facilities globally, including the reference facilities discussed in this EIS, are designed in line with best practice (defined in the European Union Best Available Techniques Reference Document) to deal with contamination within a waste stream.

5.8.4 Pre-qualification procedures

Pre-qualification procedures mitigate against receiving unacceptable waste because they include several stages that the waste supplier must pass before being allowed to deliver waste to the site.

To deliver waste to the site, a contractual agreement between the WSERRC and the waste supplier will be in place. This contractual agreement will set out the terms and conditions of supplying waste feedstock to the site, including wastes that can and cannot be accepted by the WSERRC, rights for the WSERRC to sample, test and reject the waste, rights for the WSERRC to inspect the suppliers facility and a requirement to deliver waste in line with the environmental permit for WSERRC. The waste supplier will have to agree to the terms of the contract to be allowed to deliver waste to the WSERRC.

The waste supplier will have to provide proof that the waste is appropriate for delivery to the WSERRC such as:

- Provision of information showing that the waste that is processed within the supplier's site and destined for the WSERRC does not include unacceptable wastes and meets the terms and conditions prescribed by the WSERRC
- Provision of chemical and compositional analysis of waste that leaves the suppliers facility
- Assuring that C&I waste is sourced from generators that have adequate source separation processes in place as approved by the EPA
- Evidence of suitable systems and provision of documentation that record the type of waste included within each consignment, including the source, truck identification, supplier identification and other necessary information. This will allow the source of waste loads to be tracked and to the supplier.
- Evidence that the supplier is suitably licensed by the EPA to transport waste
- Evidence that the supplier has suitable facilities for transfer and resource recovery of waste to make sure that waste delivered to the WSERRC can be thermally treated in compliance with the WSERRC's licence conditions and relevant legislation.

5.8.5 Onsite acceptance, quality assurance and quality control (QA/QC) procedures

All waste deliveries will come from suppliers approved by the WSERRC. This means that all suppliers will have to pre-qualify before they can enter the site. Unacceptable waste will be excluded through the pre-qualification process which includes contractual agreements with waste suppliers.

However, it is recognised that best practice includes on site procedures for waste acceptance. The following section describes the on-site waste acceptance protocol which forms the QA/QC procedures. Procedures will be detailed into an operational plan during the detailed design process in line with any requirements that may be included in permits and licenses.

5.8.6 Scheduling of deliveries

Waste deliveries will be scheduled with the WSERRC operations team prior to arrival at the WSERRC site. This will enable the site operational staff to monitor the waste delivery process. Schedules for waste consignments to be delivered will be prepared on an annual, quarterly, monthly, weekly and daily basis and agreed between all parties to make sure that there is sufficient storage capacity in the bunker to accommodate the nominated waste deliveries. This will avoid overfilling of the waste bunker.

5.8.7 Process on arrival

When a waste delivery vehicle arrives at the EfW facility, it will immediately proceed to the weighbridge. The operator will record the gross weight of the vehicle and will direct it to the designated tipping area or to the waste inspection bay (if chosen for inspection).

Radiation detection will be housed adjacent to the weighbridge to detect radioactive material and make sure it is not delivered to site. The radiation detection system will trigger an alarm if the level of radiation is 5 standard deviations above background radiation levels. This threshold will be tested and adjusted, if necessary, during commissioning to confirm proper operation. If a radiation alarm is raised, the vehicle will be directed to quarantine for inspection and assessment. A portable survey meter will be used to inspect the load. If a load is found to contain a source of radiation, that load will be rejected from site and will remain the responsibility of the supplier for proper disposal at a suitably licensed facility.

If the vehicle is directed to the inspection bay, as soon as practicable after the delivery vehicle has been received in the waste inspection bay, the operator inspects the paperwork, and will release the delivery vehicle to the designated tipping area or direct the delivery vehicle to the dedicated tipping area for inspection in the tipping hall for further investigation.

As soon as practicable after the load has been tipped in the dedicated inspection bay for inspection, the operator inspects the load, and will release the delivery vehicle to the designated tipping area or declare the load as unacceptable waste.

If the vehicle is not directed to the inspection bay, once the delivery vehicle has tipped its load at the designated tipping bay the delivery vehicle is to exit the facility via the designated exit points.

5.8.8 Periodic visual inspection

WSERRC will commit to a daily visual inspection of a random waste load at a minimum. An operator trained to visually inspect tipped waste loads will check the load is in line with the procedures above. In addition to the random inspections, if there is doubt as to the suitability of the waste being delivered, a delivery can be inspected at any time. If any supplier is found to have significant quantities of unacceptable wastes within a load, the inspection frequency for that supplier will be increased and discussions will be held with the supplier to identify any ongoing issues and possible solutions.

Initial visual spot checks will be carried out on all new waste suppliers that have passed the pre-qualification stage. These initial visual spot checks will confirm that the waste supplied to the WSERRC is acceptable.

5.8.9 Separation of unacceptable waste (pre-tipping)

A waste load will be rejected if:

- A contaminant detection alarm (radioactivity) is triggered
- The operator determines that a load contains unacceptable waste or that the paperwork is incorrect.

If the load is found to be contaminated upon visual inspection, and the contamination cannot be removed or is mixed throughout the waste load, it will be rejected.

Rejection of the waste load will require the waste supplier to return the waste to its own facility and dispose of it as required by legislative requirements. This will remain the responsibility of the waste supplier.

5.8.10 Separation of waste (post-tipping)

Crane operators will monitor the waste bunker and tipping bays using CCTV and will be able to control the waste that is picked up and fed to the boiler. In the unlikely event that unacceptable waste is observed within the waste bunker, the operator will be able to pick the waste from the bunker using the crane and place it within a dedicated quarantine area. Waste within the quarantine area will then be transported offsite and disposed of in accordance with the legislative requirements dependent on the type of rejected waste.

5.8.11 Sampling and testing

Sampling and testing of the waste material will be carried out on a periodic basis. There is no specific guidance provided in Australia for waste sampling for waste to energy purposes, however WSERRC proposes that sampling frequency will be quarterly as a minimum which will allow any seasonal variation (which is in itself unlikely) to be accounted for. A detailed sampling procedure will be set out as part of the operational plan for the facility at a later date however will include:

- Composition (constituents of the waste)
- Chemical analysis to determine calorific value, moisture content, sulphur content, chlorine content and ash yield.

Sampling will be carried out by a skilled operative within the inspection bay adjacent to the bunker. If a vehicle is selected for random sampling, it will be directed to the inspection bay after passing over the weighbridge. During sampling periods, samples of waste will be taken from multiple delivery vehicles, combined and mixed to present a homogenous sample (as much as is possible). A portion of this will then be sent to a laboratory for testing. If it is found during the testing process that waste supplied includes unacceptable waste, a correction plan will be put in place with the supplier (detailed at a later date dependent upon the issue). In addition, the sampling and testing frequency of the offending suppliers' loads will be increased providing a proactive approach to sampling and testing.

5.9 Reference facilities

The WSERRC proposal has adopted two reference facilities to demonstrate the maturity and suitability of the proposed energy recovery technology, in alignment with the NSW EfW policy. **Table 5.6** compares main characteristics of the reference facilities to the WSERRC proposal.

Information about the performance of the reference facilities, including operational data on air emissions and residue generation, has been used to inform expected performance of the WSERRC proposal.

Table 5.6: Overview of reference facilities

Parameter	Dublin EfW Facility	Filborna EfW facility	WSERRC proposal
Date commissioned	April 2017[7]	March 2013[8]	n/a
Location	Pigeon House Road, Poolbeg, Dublin 4[9]	Filbornaverken Öresunds Kraft Hjortshögvägen 7, Helsingborg Sweden	339 Wallgrove Road in Eastern Creek, New South Wales (Lot 1 DP 1059698)
Licencing framework	EU Industrial Emissions Directive and Waste Framework Directive translated into local legislation and administered by the EPA Ireland. Facility waste licence no. W0232-01[10]	EU Industrial Emissions Directive and Waste Framework Directive translated into local legislation and administered by the local authority.	EP&A Act 1997 and POEO Act 1997, having regard for the NSW EfW policy and European best Practice guidance
Licenced waste throughput	600,000tpa[11]	200,000tpa [12]	n/a
Operational waste throughput	599,00tpa in 2018[13]	Operates close to licensed capacity. Waste receival data not publicly available.	Design capacity: 500,000tpa
Number of incineration lines	Two lines 35tph design capacity[14] 37.5tph actual throughout based on 2018 accepted tonnage[15]	One line 27tph maximum throughput[16]	Two lines 37.5tph maximum throughput 31.3tph average throughput at design calorific value

[7] (Dublin Waste to Energy, 2017)
[8] (Oresundskraft, 2016)
[9] (Dublin Waste to Energy, 2017)
[10] (EPA Ireland, 2008, amended 2018)
[11] (EPA Ireland, 2019)
[12] (Oresundskraft, 2016)
[13] (Dublin Waste to Energy, 2019)
[14] (Dublin Waste to Energy, 2006)
[15] (Dublin Waste to Energy, 2019)
[16] (Oresundskraft, 2016)

Parameter	Dublin EfW Facility	Filborna EfW facility	WSERRC proposal
Waste feedstocks accepted (EWC)	In 2018[17]: 85% mixed municipal waste (20 03 01) 11.1% non-hazardous waste from mechanical treatment of wastes (19 12 12 – permitted within the commercial and industrial waste allowance) 2.8% bulky municipal waste (20 03 07) Minor quantities of various other waste codes.	40% MSW, 60% C&I waste.[18] Data on accepted wastes is not available by EWC code. Not all licensed waste types are regularly processed by the facility.	Residual municipal waste (MSW) Residual commercial and industrial waste (C&I) Design range 50–70% C&I waste, with the balance being MSW.
Licensed waste feedstocks according to European Waste Catalogue (EWC) classifications	Mixed municipal waste (20 03 01) Waste from markets (20 03 02) Street-cleaning residues (20 03 03) Bulky waste (20 03 07) Waste from aerobic treatment of solid waste (19 05 01) Note – derived from mixed municipal waste Combustible waste (refuse derived fuel) (19 12 10) Note – derived from mixed municipal waste Sludges from treatment of urban wastewater (19 08 05) Commercial and industrial wastes (multiple codes)[19]	Filborna has permission to receive 258 different waste types (EWC). Many of the codes are specific hazardous waste fraction. This affords the facility flexibility to meet its feedstock requirements from various sources.[20]	n/a
Onsite pre-treatment of waste	None	None	None

[17] (Dublin Waste to Energy, 2019)
[18] Information provided by Ramboll. Not publicly available.
[19] (EPA Ireland, 2019)
[20] Information provided by Ramboll. Not publicly available.

Parameter	Dublin EfW Facility	Filborna EfW facility	WSERRC proposal
Design net calorific value	10.5 MJ/kg[21]	10 MJ/kg[22]	11 MJ/kg
Electricity generation	105 MW_{th}[23] 68 MW_e gross[24] 60MW_e export[25]	18MW_e 60MW_{th}[26]	Design values: 58MW_e gross 55MW_e export
Heat recovery	No offsite heat export. Design allows for future connection to district heating.[27]	Connected to district heating system. Up to 1,100m^3 / hr of water heated to 90°C for circulation through the district heating network.[28] The facility supplies 58MW of heat to the district heating system, meeting 40% of the heating needs in Helsingborg.[29]	No offsite heat export in the short term. Turbine connection for future heat offtake will be installed to allow flexibility for heat export to future neighbouring industrial facilities.
Facility availability	Not reported	About 8000 hours per year (91%). [30]	Designed to achieve 8000 hours per year (91%)

[21] (Dublin Waste to Energy, 2006)
[22] Information provided by Ramboll. Not publicly available.
[23] (Dublin Waste to Energy, 2006)
[24] (Hitachi Zosen Inova, 2018)
[25] (Dublin Waste to Energy, 2006)
[26] (Oresundskraft, 2016)
[27] ibid
[28] (Oresundskraft, 2016)
[29] (B&W Volund, 2018)
[30] Provided by Ramboll. Not publicly available.

Parameter	Dublin EfW Facility	Filborna EfW facility	WSERRC proposal
Energy recovery performance	R1 value: 0.712[31] Design net efficiency: 29%[32] Operational net energy efficiency (including start-up and electricity grid curtailment): 27%[33]	The boiler/grate supplier (BWV) states R=1.41 for the Filborna design.[34] Design parameters indicate R = 1.48 during normal operations, but the annual average is slightly reduced due to start up and operation of auxiliary burners.	Expected gross energy efficiency: 30.5% Net energy efficiency will exceed 25%. Expected R1 value: 0.81
Combustion technology	Air-cooled moving grate[35]	Water cooled moving grate. [36] Provisions of a water-cooled grate is an additional investment which allows flexibility to operate on biomass like wood chips. Sweden has ample biomass resources and limited domestic fossil fuel resources, so this design approach is common to allow flexibility and energy security for the essential heating given by the facility. The grate cooling system does not impact the ability of the facility to safely and completely combust waste with lower calorific value, such as mixed MSW and C&I material.	Air cooled moving grate
Technology provider	Hitachi Zosen Inova (HZI)[37]	Babcock & Wilcox Vølund[38]	Not selected

[31] (Dublin Waste to Energy, 2019)
[32] (Dublin Waste to Energy, 2006)
[33] (Dublin Waste to Energy, 2019)
[34] (B&W Volund, 2018)
[35] (Hitachi Zosen Inova, 2018)
[36] (B&W Volund, 2018)
[37] (Hitachi Zosen Inova, 2018)
[38] (B&W Volund, 2018)

Parameter	Dublin EfW Facility	Filborna EfW facility	WSERRC proposal
Flue gas treatment technology	Selective non-catalytic reduction (SNCR) [39] Ammonia injection Semi-dry flue gas treatment[40] Hydrated lime injection Activated carbon injection Bag house filter Wet scrubber, sodium hydroxide	Selective non-catalytic reduction (SNCR) [41] Ammonia injection Semi-dry flue gas treatment Lime injection Activated carbon injection Bag house filter Wet scrubber, sodium hydroxide	Selective non-catalytic reduction (SNCR) Ammonia injection Semi-dry flue gas treatment Hydrated lime injection Activated carbon injection Bag house filter Wet scrubber, sodium hydroxide
Flue gas treatment residue (FGTr) generation	26,178t in 2018[42] 4.4% of waste feedstock tonnage	7,500tpa[43] 3.75% of waste feedstock tonnage.	20,000tpa expected (dry weight, including boiler ash generated downstream of boiler pass 3) 4% of waste feedstock tonnage
Flue gas treatment residue (FGTr) management	FGTr is classified as hazardous waste. Recovery at NOAH AS Langoya Island specialised hazardous waste recovery facility, Norway and K&S Salt mine facility, Germany.[44]	FGTr is classified as hazardous waste. Recovery at NOAH AS Langoya Island specialised hazardous waste recovery facility, Norway.[45]	FGTr expected to be classified as hazardous solid waste. Treatment at existing Cleanaway Hazardous Solid Waste Bulk Treatment facility in St Marys, immobilising contaminants to meet a restricted solid waste classification before disposal at appropriately licensed landfill.
IBA generation	104,061t in 2018[46] 17% of waste received.	30,000tpa[47] 15% of waste received.	80,000tpa expected (wet weight after quenching)

[39] (Dublin Waste to Energy, 2006)
[40] (Dublin Waste to Energy, 2019)
[41] (Oresundskraft, 2016)
[42] (Dublin Waste to Energy, 2019)
[43] Provided by Ramboll. Not publicly available.
[44] (Dublin Waste to Energy, 2019)
[45] (Oresundskraft, 2016).
[46] (Dublin Waste to Energy, 2019)
[47] Provided by Ramboll. Not publicly available.

Parameter	Dublin EfW Facility	Filborna EfW facility	WSERRC proposal
			16% of waste received.
IBA management	Exported to Solid Rock BV, Netherlands. [48] Ferrous and non-ferrous metals are extracted, and the remaining material is used as aggregate in road building or as landfill cover. Ongoing discussions with an Irish company and awaiting licence approvals (acceptance of IBA testing and classification as non-hazardous material) to move to a domestic solution.	IBA is classified as non-hazardous. IBA from the facility goes to an external party for further processing with removal of iron by magnets and removal of other metals by eddy current techniques. After this processing, the IBA is returned to Filborna and used as cover.[49]	Transport to offsite processing facility for metals recovery. Initially, remaining ash will be disposed to landfill as general solid waste (non-putrescible). Establishment of recovery pathways for this material in New South Wales will be pursued.
Metal recovery from IBA	In 2018:[50] 7,740t ferrous metal 5,020t non-ferrous metal	No data available as metal recovery is performed by an external party.	Ferrous metals will be recovered at the WSERRC proposal. Non-ferrous metals will be recovered at an offsite processing facility, to be designed at a later stage (See **Chapter 22 Related development**).
IBA	Sampling from 2019 gave results of 1.5% TOC and 1.9% LOI[51]	No data available	
Stack height	105m	85m[52]	About 75m

[48] (Dublin Waste to Energy, 2019)
[49] Provided by Ramboll. Not publicly available.
[50] ibid
[51] (wrc, 2019)
[52] (Oresundskraft, 2016)

5.9.1 Feedstock comparison

The NSW EfW policy introduces the concept of reference facilities which use 'the same technology treating like waste streams in a similar jurisdiction'. The purpose of applying this concept is to demonstrate that proposals can handle their proposed feedstock while operating under a robust regulatory and environmental protection framework.

The intent of the 'like waste streams' and reference facility requirements is to demonstrate that acceptable performance is achievable. The requirement is not to demonstrate that an identical facility processing identical feedstock already exists. 'Like waste streams' can be compared through consideration of the overall waste streams, for example whether it is sourced from MSW, C&I or C&D. Both reference facilities (Dublin and Filborna) accept a mixture of MSW and C&I waste, the same waste streams the proposal will seek to source feedstock from as part of the defined waste feedstock strategy in **Section 5.4**. The relative proportions of the MSW and C&I waste that make up the overall feedstock will constantly differ, but this is not significant, as the material components of MSW and C&I waste streams are considered broadly similar and there are no waste streams being routinely processed at the reference facilities that comprise of substantially different material components.

Detailed waste audit composition data on the feedstock accepted at either the Dublin of Filborna facilities has not been made available. However, regarding the Dublin reference facility, there is recent waste audit data available for Ireland. Two reports by the Clean Technology Centre in conjunction with the Environmental Protection Agency of Ireland from 2018 undertook compositional analysis of general waste, co-mingled recycling and organic waste streams in Ireland.

In the context of these two reports:

- General waste is the term used to describe residual waste and was sampled from commercial waste and household waste streams.
- Commercial waste is a term used to describe the non-household fraction of municipal waste, which is produced by commercial premises such as shops, offices and restaurants, as well as municipal premises such as schools, hospitals and so on.
- Household waste is defined as waste produced within the curtilage of a building/residence or self-contained part of a building/premises used for the purposes of living accommodation.

Table 5.7 presents the waste material categories expected to be received at WSERRC (across both MSW and C&I streams) compared to the waste material categories present in the MSW (household) and C&I (commercial) streams in Ireland (which is considered representative of the waste that the Dublin reference facility receives as feedstock).

Table 5.7 Comparison of waste material categories for WSERRC and Dublin

Waste materials expected at WSERRC (C&I and MSW)	C&I waste material categories from Ireland audit[53]	MSW waste material categories from Ireland audit[54]
Paper and card	Paper, cardboard	Paper, cardboard
Plastic film	Plastic	Plastic
Dense plastic		
Textiles	Textiles	Textiles excl. nappies
Glass	Glass	Glass
Inert material (concrete, rock, ceramics etc)	Unclassified incombustibles	Unclassified incombustibles
Food and kitchen waste	Organic waste, compostables	Organic waste (garden), organic waste (non-garden)
Garden waste		
Other organics		
Ferrous metal	Metal	Metal
Non-ferrous metal		
Electronic equipment, household chemicals and pharmaceuticals	Unclassified incombustibles, Haz municipal waste	Haz municipal waste (excl. WEEE & tubes), WEEE & Tubes
Fine material <10mm	Fines	Fines (<20mm)
Absorbent hygiene products	n/a	Nappies
Wood	Wood	Wood
n/a	Unclassified combustibles	Unclassified combustibles

It can be seen that the materials are comparable between WSERRC and Dublin, with the exception of 'unclassified combustibles' which was not reported on for the audits done to inform the WSERRC Proposal and would likely comprise materials such as composite packaging (primarily made from a combination of plastics and paper/card).

Furthermore, the Clean Technology Centre[53] state that in Ireland

'commercial waste is broadly similar in composition to household waste, consisting of a mixture of paper and cardboard, plastics, organics, metal and glass'.

[53] (Clean Technology Centre, 2018)
[54] (Clean Technology Centre, 2018)

Refer to the **Technical report C Waste and Resource Management Assessment** for further information on waste composition of the expected WSERRC feedstock.

5.10 Emissions to air

The facility will be designed, built and operated in compliance with the EU Industrial Emissions Directive (IED 2010/75/EU) and the 2019 reference document on best available techniques for Waste Incineration (BREF-WI).

As shown in **Table 5.6**, the reference facilities use the same flue gas treatment stages and process comparable waste streams to the WSERRC proposal. So, the air emissions data from the reference facilities affords a high level of confidence in the capability of the proposed technology to control air emissions.

Table 5.10 illustrates that emissions to air from the reference facilities are fully compliant with both the NSW emissions limits under the POEO Act and the EU emissions limits under the IED, and in most cases perform significantly below these limits, in line with latest best practice (BREF-WI 2019).

When comparing the emissions limit values and monitoring data between jurisdictions, it is vital to note differences in the environmental regulation frameworks for emissions to air. The framework created by the EU IED sets multiple emissions limit values for most pollutants, based on multiple averaging periods.

Emissions limit values for shorter averaging periods (typically hourly or half-hourly) are higher than emissions limit values for longer periods (typically daily), acknowledging that emissions fluctuate over time. This approach aims to control both total pollutant load and limit possible short-term spikes of high pollutant concentrations. The legislation also includes provisions for a small proportion of recorded values to exceed the emissions limits due to very short-term deterioration of performance, or brief malfunction of continuous monitoring equipment. For example, **Table 5.8** and **Table 5.9** show incidents, emissions monitoring malfunctions and exceedances of short-term ELVs recorded at the Filborna reference facility and the Dublin reference facility respectively in 2019. This level of performance reliability is acceptable under the IED framework. The WSERRC proposal will have a redundant CEMS system on each operating line, which means that an instrument failure of one unit does not affect the measurement ability for WSERRC.

In contrast, the NSW POEO Clean Air regulations specify a single averaging period for each pollutant and the limit value is a threshold which cannot be exceeded under any circumstances.

The reference conditions for measurement also differ between legislation: European air emissions monitoring results are standardised to 11% O_2, whereas under the NSW POEO Clean Air regulations, all air emissions monitoring results except dioxins and furans are standardised to 7% O_2 for facilities burning solid fuel. For dioxins and furans, measurements are standardised to 11% O_2.

These differences partly explain the significant difference in emissions limit values between jurisdictions. However, the data in **Table 5.10** clearly demonstrates that the flue gas treatment equipment is capable of achieving emissions values well below all legislative limits for all air pollutants, and in most cases also well within the best-practice range developed in BREF-WI 2019.

Further details of air quality modelling and impact assessment can be found in **Technical report A Air Quality and Odour Assessment**.

Table 5.8: Filborna exceedances of emission limit values in 2019[55]

Exceedance	Instances in 2019	% of reporting
CEMS problems (instrument failure): ½ hr measurement rejected	165	0.9%
CEMS problems (instrument failure): Daily average measurements rejected	5	1.4%
½ hr CO exceeded ELV	21	0.1%
½ hr TOC exceeded ELV	2	0.01%
½ hr NOx exceeded ELV	9	0.005%
½ hr SO_2 exceeded ELV	9	0.005%

Table 5.9: Dublin incidences and exceedances in 2019[56]

Incident	Instances in 2019[57]
Minor fire	1
Breach of ELV	2
Combustion temperature below 850°C	4
Monitoring equipment issues	1

[55] Information provided by Ramboll. Not publicly available.
[56] Covanta, 2019.
[57] Based on Q1 to Q3 reporting in 2019, Q4 not available at time of writing

Table 5.10: Comparison of emission limit values and facility performance

Parameter	Unit	NSW POEO[58]	IED[59]	2019 BREF range [60]	Dublin maximum value during independent stack testing	Dublin average value during independent stack testing[61]	Dublin daily values from operational monitoring[62]	Filborna annual mean emission 2017[63]	Filborna annual mean emissions 2018[64]
HCL	*mg/m³*	100	10	6–2	Not reported	Not reported	0.04–0.14	0.1	0.0
SO_2	*mg/m³*	No applicable standard	50	30–5	Not reported	Not reported	0.00–0.37	0.3	4.1
NOx as NO_2 equivalent	*mg/m³*	500	200	120–50	5.52	2.96625	107.68–134.57[65]	73	72
CO	*mg/m³*	125	50	50–10	Not reported	Not reported	2.93–14.71	2.9	2.7
Dioxins and furans	***ng/m³***	0.1	0.1	0.04 – < 0.01	0.0022	0.000955	Not reported	0.0015	0.0018
Mercury	*mg/m³*	0.2	0.05	0.035–0.015	0.00125	0.00061143	Not reported	0.0008	0.0002
Sum of cadmium, thallium and their compounds	*mg/m³*	0.2 (cadmium only)	0.05	0.02–0.005	0.00073	0.00065667	Not reported	0.0004	0.0022
HF	*mg/m³*	50	1	<1	0.5	0.258	Not reported	0.006	0.005

[58] (NSW legislature, 2010)
Schedule 3: Standards of concentration for scheduled premises: activities and plant used for specific purposes. Electricity generation facility. Group 6 facility (EPL granted after 2005).
[59] (European Parliament, 2010)
[60] (European Commission, 2019)
[61] (Covanta, 2020). Independent stack testing conducted quarterly and reported for 2018 and 2019.
[62] (Covanta, 2020) Considering data for the week of 30/3/20–5/4/20. Archival data not available.
[63] Information provided by Ramboll. Not publicly available.
[64] Information provided by Ramboll. Not publicly available.
[65] Note that the emissions limit values for the Dublin Reference facility pre-date the 2019 BREF update and are based on the IED. The daily emission limit value for NO_x in Dublin facility operating licence is 200mg/m³. The results from operational monitoring show that the facility is operating as designed and fully in compliance with its licence conditions.

Parameter	Unit	NSW POEO[58]	IED[59]	2019 BREF range [60]	Dublin maximum value during independent stack testing	Dublin average value during independent stack testing[61]	Dublin daily values from operational monitoring[62]	Filborna annual mean emission 2017[63]	Filborna annual mean emissions 2018[64]
Total solid particles (dust)	*mg/m³*	50	10	5–2	Not reported	Not reported	0.31–0.71	0.0	0.2
$PM_{2.5}$	*mg/m³*	50	No limit	No limit	0.37	0.15375	Not reported	Not reported	Not reported
TOC	*mg/m³*	No limit	10	No limit	Not reported	Not reported	0.10–0.35	0.3	0.6
Heavy metals	*mg/m³*	1[66]	0.5	0.3–0.01	0.037	0.0204625	Not reported	0.125	0.028

Key:

Below 2019 BREF Lower	Within 2019 BREF range	Below IED ELV	Below NSW POEO ELV	Exceeds NSW POEO ELV	No data

[66] Emissions limit value provided only for Type 1 and type 2 substances in aggregate. Type 1 substances are defined as Antimony, arsenic, cadmium, lead, mercury or any compound containing one or more of those elements. Type 2 substances are defined as beryllium, chromium, cobalt, manganese, nickel, selenium, tin, vanadium or any compound containing one or more of those elements.

5.11 Management of process residuals

While some residual materials are produced because of the EfW process, including incinerator bottom ash (IBA), boiler fly ash and flue gas treatment residues (FGTR), the EfW process typically leads to about 90% reduction in the volume, or 80% reduction in mass (tonnes), of waste that would otherwise go to landfill. If IBA is reused into construction products, this number increases further to about 95% reduction in volume and mass of waste that would otherwise go to landfill. The main residue streams from the energy recovery process that must be managed are:

- IBA – 65,800tpa dry weight, becoming 80,000tpa wet weight after quenching. These figures include boiler fly ash fraction from the radiant sections of the boiler that are deposited with IBA and form a combined stream for treatment and recovery.
- Flue gas treatment residue (FGTr) – 20,000tpa. This figure includes the remaining boiler fly ash fraction that are deposited in subsequent stages of the system.
- Boiler fly ash – incorporated into the IBA and FGTr tonnages above.

The expected classification of each residue stream has been determined by comparing residue characterisation data from the Dublin reference facility to the NSW Waste Classification Guidelines. The resulting classifications are broadly consistent with typical characterisation and classification benchmarks of EfW facilities processing similar waste streams throughout the UK and EU. However, standard testing procedures differ between jurisdictions and direct testing of residues using the procedures prescribed in the NSW Waste Classification Guidelines is recommended during the commissioning phase to confirm waste classifications.

Appropriate management approaches have been developed based on the expected classification of these process residues. Further details of residue composition data and expected classification under the NSW Waste Classification Guidelines can be found in the **Technical report C Waste and Resource Management Assessment**.

Table 5.11 presents the expected residues from the energy recovery process and management approach for the proposed WSERRC proposal.

Potential environmental and human health risks related to storage and handling of these solid residues are managed through best-practice design and operation, as reflected in the **Chapter 3 Proposal description** and **Technical report D Best Available Techniques Assessment**. These risks have been assessed in the preliminary hazard assessment, and mitigation measures have been developed where appropriate (see **Technical report J Preliminary hazard analysis**).

Table 5.11: Summary of solid residues and management approaches

Residue	Residue generation	Expected classification	Management approach
IBA	80,000tpa (wet weight)	General solid waste (non-putrescible)	Incinerator Bottom Ash (IBA) is produced as a waste by-product from the EfW combustion process. IBA is an inert by-product which contains ferrous and non-ferrous metals. IBA will be stored in a bunker with a minimum of 5 days storage capacity. The WSERRC will include a ferrous metal separator on site to recover large ferrous metals from the IBA for recycling and sale to market. The remaining IBA may be transported to a dedicated IBA processing, treatment, metal recovery and maturation facility where non-ferrous metals (or secondary metals) recovery may be carried out. Options to reuse the IBA in construction products are being explored by the applicant and would be subject to getting the necessary Resource Recovery Order and Exemption under the POEO (Waste) Regulation 2014. The EPA would be consulted with regarding any such IBA exemption. The IBA processing facility, if progressed, will be subject to a separate development application process, however, the site location for storage and/or treatment has not been finalised at this stage. The IBA processing and secondary metals recovery facility does not form part of this proposal and will be subject to a separate development application process which is discussed further in **Chapter 22 Related development**. If the resource recovery pathways have not been developed for the IBA before commissioning of the WSERRC, IBA will be disposed to a suitably licensed landfill as general solid waste (non-putrescible) until a suitable reuse is determined. Suitably licensed landfills in the surrounding area include: • Suez Elizabeth Drive landfill, Kemps Creek (EPL 4068) • Penrith Waste Services Mulgoa Road landfill, Mulgoa (EPL 3438) • Cleanaway Erskine Park Landfill, Erskine Park (EPL 4865) • Dial-a-Dump Genesis Landfill, Eastern Creek (EPL 13426) • Blacktown Waste Services Marsden Park Landfill, Blacktown (EPL 11497).

Residue	Residue generation	Expected classification	Management approach
Flue gas treatment residues (FGTR)	20,000tpa (dry weight)	Hazardous waste when produced. Restricted solid waste when disposed.	The WSERRC design will include a minimum of 6 days storage capacity for FGTr. Treatment will be needed to immobilise contaminants in line with the NSW EPA Environmental Guidance for Solid Waste Landfills (2nd edition, 2016). Treatment will reduce the leachable and total contaminant concentrations below the 'hazardous' threshold in the NSW Waste Classification Guidelines. The FGTR would be transported in sealed trucks to Cleanaway's Bulk Hazardous Solid Treatment facility in St Marys (42–46 Charles Street, Saint Marys 2760). The St Mary's facility has the processing capacity and is licenced to accept and treat FGTr material. There is no limit on the annual processing capacity at St Mary's as stipulated in the facility's EPL (EPL 20271). However, there is a limit on storage at the facility i.e. the quantity of waste, treated or otherwise, stored on the premises must not exceed 5000 tonnes at any one time. In the case that the St Mary's facility is not available, FGTr will be sent to another suitably licenced facility. The treated residues will be disposed to an appropriately licensed landfill for restricted solid waste.
Boiler fly ash	Incorporated into the IBA and FGTr tonnages above	Dependent on the ash stream it is collected with above	Part of the boiler fly ash stream is captured with the IBA and part of this ash stream is captured with the FGTr and will be transported for disposal according to the ash type it is collected with.

Chapter 6

Engagement

6 Engagement

One of the objectives of this proposal is to:

'Build trust with the community through ongoing engagement in the planning, design, construction and operation of the EfW facility.'

As a result, the development of the WSERRC proposal has been informed by a comprehensive approach to community and stakeholder engagement based on a commitment to building long-term and respectful relationships.

If the proposal is approved, engagement will continue throughout construction and the operational life of the proposal. The visitor and education centre will play a vital role in offering information on the role of EfW in managing waste as part of an integrated waste management strategy.

This chapter summarises the community and stakeholder engagement that has been conducted to date. The Community and Stakeholder Engagement Report is included as **Appendix F**.

This chapter includes:

- A summary of the community and stakeholder engagement strategy
- A description of the form of engagement activities conducted to date
- A summary of the issues raised in the engagement, and how and where in the EIS they have been discussed
- Details of the proposed approach to future community and stakeholder engagement.

6.1 Community and stakeholder engagement strategy

6.1.1 Engagement approach

The approach to community and stakeholder engagement included the following:

- Early community research and consultation to identify issues of interest to the community and stakeholders and preferences for how they wish to be engaged, including the types of information which they find credible and trustworthy
- Applying the International Association of Public Participation (IAP2) framework
- Developing clear objectives to underpin the community and stakeholder engagement strategy
- Decide on key stakeholder groups to engage with
- Mapping the communications and engagement process.

6.1.2 Community research and consultation

Both qualitative and quantitative research was undertaken to gauge the community's understanding and perception of waste management and EfW technology generally and more specifically an EfW facility in Western Sydney. This research also sought to understand the community's communication preferences which shaped the community and stakeholder engagement strategy used in the EIS process.

The qualitative research found that the community:

- Generally, has a low level of awareness and understanding about waste management processes and issues
- Had an initial positive response to the idea of EfW as a waste management solution. However, questions were raised about potential impacts to the community.
- Had concerns that EfW would cause negative impacts such as: health, emissions and odour, traffic congestion, affecting property values, impacting recycling habits, and increasing council rates. When given examples of well-designed EfW facilities in Europe, this softened the assumption that these facilities would have negative health and environment risks.
- Recognised the benefits of EfW, including local jobs, energy production, proven approach in other cities and countries, and an alternative to landfill.

- Found trustworthy sources of information to come from: testimonies of communities living near EfW facilities, scientific bodies (like CSIRO), universities, the EPA, international experts, those currently running similar EfW facilities, and health experts (NSW Department of Health and Westmead Hospital).

The quantitative research found that:

- The level of information offered to the community increased their acceptance of an EfW facility.
- There is a need to build education and awareness of EfW and its benefits in response to a low level of understanding among research participants.
- There is strong support for recycling.
- Credible communication about health and safety is critical.
- Images and videos help with communicating complex projects.
- There is a relatively high demand for engagement in relation to an EfW proposal.

In response to questions about engagement preferences, the research found that most respondents would like to be informed about plans for any local EfW facility and with a preference for engagement that offers:

- Representative community engagement with options for different engagement tools (in person, online surveys)
- Readily accessible, clear information without jargon
- Absolute transparency.

6.1.3 International Association of Public Participation

The International Association of Public Participation (IAP2) gives guidance on good practice for community and stakeholder engagement and public participation. The IAP2 is a generally accepted methodology and used by local and state government and Australian Government agencies. IAP2 conducts nationwide training for engagement, including Government staff, on a regular basis.

One of the tools used by practitioners is called the ‘public participation spectrum’, which is designed to help inform selection of the level of participation for any community engagement program (see **Table 6.1**). The different levels of participation categorised in the spectrum are inform, consult, collaborate, involve and empower.

The engagement level for this proposal is ‘consult’, which is defined in the spectrum as ‘to obtain public feedback on analysis, alternatives and/or decisions.’ This level of engagement involves meaningful and informed discussions with local residents, businesses and Government agencies. In a complex, highly engineered proposal, which relies on scientific and technical evidence to commit to global best practice, ‘consult’ is seen as an appropriate level of engagement.

INCREASING IMPACT ON THE DECISION

	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
PUBLIC PARTICIPATION GOAL	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.	To obtain public feedback on analysis, alternatives and/or decisions.	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision making in the hands of the public.
PROMISE TO THE PUBLIC	We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision.	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	We will look to you for advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.	We will implement what you decide.

Figure 6.1: IAP2s Public Participation Spectrum (IAP2, 2014)

6.1.4 Engagement objectives

The objectives of the community and stakeholder engagement strategy were developed through feedback from the early community research and to align with the IAP2 ‘consult’ level.

The objectives of the communication and stakeholder engagement strategy include:

- **Information**: offer information about the Western Sydney Energy and Resource Recovery Centre (WSERRC) that is comprehensive, accessible and trustworthy.
- **Feedback**: actively seek and respond to community and stakeholder views.
- **EIS process**: clearly explain the EIS process and opportunities for community and stakeholder engagement throughout the process.
- **Two-way consultation**: exchange detailed information from technical investigations through discussions with community and stakeholders.

6.1.5 Identifying key stakeholder groups

To help design the engagement strategy and the tools that should be used, it is important to broadly classify the different stakeholder groups who may need information in different formats or through different channels.

As a result, five key stakeholder groups were selected for engagement, including:

- **Group 1**: residents, businesses and community stakeholders closest to the proposal site
- **Group 2**: residents, businesses and community stakeholders within an 8km radius of the proposal site
- **Group 3**: residents, businesses and community stakeholders in the wider (Western Sydney) region
- **Group 4**: Australian Government agencies (local, State and Federal)
- **Group 5**: people who, following the proposal announcement, subsequently registered their interest.

6.2 Engagement activities and tools

Various engagement tools were used to give different mediums of engagement. Employing a wide range of engagement tools (that span different mediums for sharing information) maximises accessibility of this information and the ability of various stakeholders to engage with the proposal and enables genuine discussions with the community, businesses and government agencies.

The engagement tools used were chosen for the following purposes:

- To offer information to the community and stakeholders
- To receive information from the community and stakeholders
- To have two-way information exchange.

Table 6.1 outlines the engagement tools employed and provides a summary of how these tools were used in the engagement to date.

Table 6.2 indicates what tools were used for each stakeholder group. The engagement tools were considered to make sure that all identified stakeholder groups where responded to. The tools were designed so that different groups could engage over the proposal and different tools have a different focus. For example, whilst government agencies could use the 1800 line, it is unlikely they would use this tool.

Section 3.4.3 of the Community and Stakeholder Engagement Report (**Appendix F**) provides a detailed timeline of when these engagement tools were used.

Table 6.1: Engagement activities and tools

Engagement tool	Description
Community start-up workshop	On Saturday, 9 November 2019, a community workshop was held with community members and stakeholders in attendance. The aim of the start-up workshop was to consult with a diverse cross-section of the local Western Sydney community. The workshop was held in an interactive manner, with whole-group discussions and break-out group discussion sessions. The workshop objectives were to: • Understand the key issues from a recruited broad cross-section of the local community • Seek feedback on the best channels to communicate with the community and priority content • Further refine the community and stakeholder engagement strategy • Use the output to inform the EIS.
Door knocking	Door knocking is a simple yet effective way of contacting the community, understanding on-the-ground sentiment, and helping with raising awareness. If someone was not home when door knocking took place, a proposal brochure was left to encourage them to give feedback to the team by the proposal email address or toll-free phone number. Between October 2019 and February 2020, 3061 doors were knocked, resulting in 789 interactions with community members located in: Horsley Park, Erskine Park, St Clair, Wetherill Park and Minchinbury.
Postcard mailbox drop	Postcards were distributed to around 11,000 households in the Erskine Park, Minchinbury, Horsley Park, Bossley Park, Cecil Park, Mount Vernon, Prospect and Abbotsbury areas. The postcards have summary information about the proposal, with details of how to access further information.
Air and Health Citizens Panel	In consultation with the community, comments were received around the impact of the proposal on air quality and human health, including requests for additional information. This led to the establishment of an Air and Health Citizens Panel with four sessions held. The Air and Health Citizens Panel sessions created an opportunity to engage with the community on an issue that requires a lengthy and detailed conversation and studied the community's response to the air quality and health assessment methodology (did they feel it was enough?). Further details on the Air and Health Citizens Panel sessions can be found in Section 3.5.6 of **Appendix F Community and Stakeholder Engagement Report**.
Meetings	Extensive meetings and briefings took place with a range of stakeholders, including government agencies, businesses and residents and other various stakeholders within the community. Further information about the meetings that took place can be found in Section 3.5 of **Appendix F.**
Pop-up information stands at markets and shopping centres	Community information stands were located at local shopping centres and highly populated events in the Western Sydney area, to offer the community an informal two-way information exchange opportunity.
Proposal brochure	The proposal brochure was an 8-page colour brochure in plain English with images and infographics to help a wide range of readers. The brochure was handed to residents while doorknocking (if further information was requested, or if the resident was not home at the time), at shopping centre pop-up stalls, community workshops and stakeholder meetings.

Engagement tool	Description
Question and answer documents	Question and answer documents were used to provide the community with written responses to questions raised at meetings. A frequently asked questions and answer document was also prepared before the announcement of the proposal and can be accessed on the website.
Advertising in local newspapers	Advertisements were placed in the following local publications: Blacktown Advocate, Blacktown Advertiser and Fairfield Advance from 3 October 2019 to 31 March 2020. Each advertisement featured the website and phone number to help the community with the opportunity to ask a question or submit feedback. Print newspaper advertisements were used to reach and inform an audience that may not be digitally capable.
Proposal website	The proposal's website (www.energyandresourcecentre.com.au) was launched on 3 October 2019. It contains images and videos to help with communicating the proposal and some of the complex issues involved in designing an EfW facility. It has best practice usability and accessibility standards. The website includes content about proposal milestones, resources, the proposal's Scoping Report and the SEARs. The website was established to provide the largest possible audience (including those who avoid or are unable to attend face-to-face interactions) with information about the proposal, and how to submit their feedback. The website was promoted in the proposal brochure, media releases, local newspapers, doorknocking slips, newsletters and social media posts.
Media releases (radio, TV, and social media posts)	Media releases help with communicating information about the WSERRC to the largest possible audience. Social media posts (Facebook, LinkedIn, Twitter) were made to increase awareness among a broader audience and redirect traffic to the proposal website.
Videos	The website includes animated videos to help with explaining the proposal. Videos providing information from overseas experts (Herman Huisman virtual tour) was also presented at meetings as a source of information likely to be trusted by community and stakeholders.
Email updates to the proposal stakeholder database	Email updates aligned to proposal milestones as follows: • Scoping Report released: 247 emails sent on 25 November 2019 • SEARs released: 233 emails sent on 17 December 2019 • Call for information to be thought about in the preparation of the EIS and updated website: 233 emails sent on 9 March 2020.
Toll-free 1800 information line and proposal email address	The proposal email address is: energyandresourcecentre@cleanaway.com.au and the toll-free phone number is: **1800 97 37 72** The email and toll-free phone number enable accessible, two-way information exchange opportunities for everyone, including those who could not access the proposal sponsors in person or online. The proposal email and toll-free phone number are promoted on the proposal's website, brochure, media releases, advertising materials, doorknocking slips and the newsletter. Between October 2019 and March 2020, 13 emails and 20 phone calls were received. All queries needing a response were resolved.

Table 6.2: The engagement tools employed for each stakeholder group

Engagement tools	**Stakeholder Groups**				
	Group 1: Residents, businesses, community stakeholders closest to the proposal site	**Group 2:** Residents, businesses, community stakeholders within an 8km radius of the proposal site	**Group 3:** Residents, businesses, community stakeholders in the wider (Western Sydney) region	**Group 4:** Government agencies (local, state and Australian Government)	**Group 5:** People who, following the proposal announcement subsequently registered their interest
Community research		✓	✓		
Postcard mailbox drop	✓	✓			
Proposal brochure	✓	✓			
Videos	✓	✓	✓	✓	✓
Proposal website	✓	✓	✓	✓	✓
Question and answer documents	✓	✓	✓	✓	✓
Media releases (radio, print) and social media posts)	✓	✓	✓		
Advertising in local newspapers	✓	✓	✓		
Email updates to the stakeholder database				✓	✓
Air and Health Citizens Panel	✓	✓		✓	
Toll-free 1800 information line and proposal email address	✓	✓	✓		✓
Community start-up workshop	✓	✓		✓	
Pop-up information stands at markets and shopping centres	✓	✓	✓		
Door knocking	✓				
Meetings	✓	✓		✓	

6.2.1 Impact of COVID-19 on engagement activities

Because of the 2020 COVID-19 pandemic and associated government restrictions, the online engagement tools listed above became more needed to continue to meet the engagement objectives of the proposal. For example, the third and fourth Air and Health Citizens Panel sessions were changed from a face-to-face interaction to an online environment. Online and virtual interactions are currently being discussed to continue engagement with stakeholders following lodgement of the EIS.

6.3 Issues raised during consultation

The Community and Stakeholder Engagement Report (**Appendix F**) presents a detailed description of the key questions and issues raised throughout the engagement process to date. These questions have been responded to as part of ongoing communication between the engagement team and the stakeholders. Extensive written responses were made available on the proposal website, via email, in response to the community start-up workshop, by social media posts and as part of the Air and Health Citizens Panel.

The following sections summarise the key issues raised by government agencies, businesses, residents and other community stakeholders and an explanation of where these issues have been discussed in the EIS.

Specific Aboriginal community consultation has also been conducted and is summarised in **Chapter 19 Heritage** and **Technical report O Aboriginal Cultural Heritage Assessment Report**.

6.3.1 Stakeholder feedback

6.3.1.1 Stakeholders identified in the SEARs

In preparation of the EIS, engagement with the relevant local and state authorities or Australian Government, service providers, community groups and affected landowners has been conducted. A list of specific stakeholders the proposal must consult with was included in the SEARs and these are listed below in **Table 6.3** with a summary of the key issues raised and how and where the EIS responds to these issues. Several other stakeholders were engaged beyond the list mentioned in the SEARs and the table below, which are included in **Appendix F Community and Stakeholder Engagement Report**.

Table 6.3: Stakeholders identified in the SEARs

Issues raised	How and where this is addressed in the EIS
Blacktown City Council (BCC)	
Feedstock management Council emphasised the need for good waste management and recycling practices as well as protocols to prevent contaminated waste entering the combustion process.	EfW is complementary, rather than an alternative to other steps in waste hierarchy when thought of as part of an integrated waste management strategy. On the waste hierarchy, energy recovery of residual waste is preferable to landfill because it recovers some value from the waste, requires less land, lessens the legacy impacts of landfills such as soil and water contamination from leachate as well as reducing odour impacts. Before arriving at the EfW facility, waste will be either processed to recover valuable materials to be recycled and reused or collected as source-separated waste streams. Materials will be recovered through the EfW process onsite, including metals which will be sold to metal recyclers and IBA. It is the intention that IBA will be transferred offsite to a separate facility, subject to a separate planning approval process as described in **Chapter 22 Related development,** where further metals recovery will take place. Options for the reuse of IBA in construction products replacing virgin materials are being investigated, which would allow these materials to be returned to productive use in line with practice in other jurisdictions. The EfW facility will apply procedures for the inspection, quarantine and rejection of unacceptable waste. This is outlined in **Section 5.8** of **Chapter 5 EfW policy**. **Section 5.4** of **Chapter 5 EfW policy** describes the proposed feedstock strategy for the proposal. **Section 2.2** of **Chapter 2 Strategic context** describes the role of recycling and the EfW process in the waste hierarchy.
Good quality architecture and landscape design How has the proposal sought to achieve a good quality design in the approach to architecture and landscape design?	One of the objectives of this proposal is to '*Develop a facility which integrates the built form into the existing context, including adopting architecture which minimises visual bulk, and provides opportunities to enhance the appearance of the building'*. To make sure that high-quality architecture and landscape design is achieved, key design aspirations were used to underpin the approach. Some of these included: • Become a catalyst for high-quality design and innovation in Western Sydney • Create an exemplar facility • Shape the built form to mitigate visual impact • Select materials which complement and align with the local environment • Be honest and transparent about the purpose of the facility • Carefully think about the building's appearance from key public viewing points • Offer an excellent visitor experience to educate and inspire.

Issues raised	How and where this is addressed in the EIS
	The physical bulk of the building was broken down by using vertical blades. The use of the 'blades' interrupts the large façades, so they are more visually interesting and less bulky as well as breaking up the mass from main viewing corridors on the M7 in the north and south directions. To further soften the building's appearance from the road and connect it to the landscape, the northern and southern ends of the building will be covered in living green walls to help blend the proposal into the vegetated backdrop. The landscape design also included screening around the perimeter of the site to block direct views and increase density of roadside vegetation. The design tightly wraps the building, eliminating any wasted space. The areas in-between the blades are to be clad in materials which become increasingly transparent as you move along the building. Alternative architecture design options were considered for the proposal (see **Section 2.6.8** of **Chapter 2 Strategic context)**. The architecture design was influenced through engagement with stakeholders, such as architectural staff from Blacktown City Council. The approach to architecture and landscape design is described in **Section 3.3.1** of **Chapter 3 Proposal description** and **Appendix B Architecture and Landscape Design Strategy Report**.
Artwork Interested to know if there are opportunities for artwork to be incorporated into the design.	EIS has responded to this query raised by Council. The EIS has committed to selecting a local artist to contribute to specific design elements where appropriate. See **Appendix B Architecture and Landscape Design Strategy Report**.
Visual impacts Visual impacts of the proposal on viewpoints, including the M7 and visual impacts of the plume	The proposal includes large visual elements, such as the stack and plume, which would result in a noticeable change for several viewpoints. As above, the physical bulk of the building was broken down by using vertical blades. The use of the 'blades' interrupts the large façades, so they are more visually interesting and less bulky as well as breaking up the mass from main viewing corridors on the M7 in the north and south directions. To further soften the building's appearance from the road and connect it to the landscape, the northern and southern ends of the building will be covered in living green walls to help blend the proposal into the vegetated backdrop. The landscape design also included screening around the perimeter of the site to block direct views and increase density of roadside vegetation. The impacts on landscape character areas and specific viewpoints are covered in **Section 16.3** of **Chapter 16 Landscape and visual** and Section 5, 6 and 7 of **Technical report L Landscape and Visual Impact Assessment.**

Issues raised	How and where this is addressed in the EIS
Heavy vehicle impacts Heavy vehicle impacts on the surrounding residences and adjoining businesses	The proposal will generate additional heavy vehicle trips for feedstock and waste removal. The proposed routes comply with the requirements for heavy vehicle routes under the NSW Heavy Vehicle Access Policy Framework. See **Section 15.2** of **Chapter 14 Traffic and transport** and **Section 4.5** of **Technical report K Traffic and Transport Assessment**. The nearest residential area is around 1km to the south of the site in Horsley Park with the Minchinbury residential area is located around 3km to the north-west.
Community investment Describe the proposed approach to community investment.	A Community Reference Group (CRG) will be created in construction and function across the life of the proposal. The CRG will be responsible for administering a community funding package among other duties. Funding contributions would total $150,000 per year and, subject to consultation and a decision by the community reference group (CRG), could be made towards community-based initiatives, development of local sporting infrastructure, community facilities and environmental areas such as tree plantings. See **Section 6.6.3** of this chapter and Appendix C of the **Community and Stakeholder Engagement Report.**
Fairfield City Council	
Appropriate residual ash management The EIS should clearly outline how ash is managed.	The proposal will produce three types of ash: 1. Incinerator Bottom Ash (IBA) 2. Boiler Fly Ash 3. Flue Gas Treatment residues (FGTr). **Section 3.4.16** of **Chapter 3 Proposal description** explains how these ash residues are to be managed.
Waste feedstock and contaminated bins Describe the feedstock strategy for the proposal and how contamination of waste will be managed.	The EfW facility will apply procedures for the inspection, quarantine and rejection of unacceptable waste. This is outlined in **Section 3.4.6** of **Chapter 3 Proposal description**. **Section 5.4** of **Chapter 5 EfW policy** describes the feedstock strategy for the proposal. WSERRC and Cleanaway will actively support the transition to FOGO with Councils, including through the education of the community which is critical to a successful transition and achieving low contamination rates.
Circular economy Think about how local government can support a transition to a circular economy.	**Section 2.5** of **Chapter 2 Strategic context** assesses how the proposal will support Australia's transition to a circular economy in line with the NSW Circular Economy Policy Statement 2019. The proposal will actively support the transition to FOGO with Councils, including through the education of the community which is critical to a successful transition and achieving low contamination rates. This will support Councils on their journey to a circular economy.

Issues raised	How and where this is addressed in the EIS
Environment Protection Authority (EPA)	
Process water management Interested in understanding if process water is reused or if wastewater is generated.	The main objective regarding water use is to reuse as much water as possible in the EfW process. No wastewater generated onsite will need treatment offsite in normal operation. See **Section 3.4.17** of **Chapter 3 Proposal description**.
Flue gas treatment system Interested in understanding how the flue gas treatment system can deal with hazardous waste.	The EfW facility will apply procedures for the inspection, quarantine and rejection of unacceptable waste. This is outlined in **Section 5.8** of **Chapter 5 EfW policy**. The NSW EfW policy states that *'to ensure emissions are below levels that may pose a risk of harm to the community, facilities proposing to recover energy from waste will need to meet current international best practice techniques.'* This proposal will use advanced flue gas treatment technology as the means to manage air emissions and has been designed to meet the European Industrial Emissions Directive (IED) (directive 2010/75/EU of the European Parliament)[1] and the associated Best Available Techniques Reference[2] (BREF) document which sets the European Union environmental standards for waste incineration as published on 3 December 2019. The EU Commission Implementing Decision (2019/2010) on the 12 November 2019 states the best available techniques (BAT) conclusions as the key element of the BREF and prescribes them to be adopted by Member States. Additionally, the facility will comply with the technical criteria set out in the NSW Energy from Waste Policy Statement (refer to **Chapter 5 EfW policy**). A Continuous Emissions Monitoring System (CEMS) will also be employed to continually monitor flue gases to make sure the plant is compliant with statutory emissions limits as set out in this document.
Control of fuel rates Interested to understand how variable fuel rates are controlled.	The composition of waste feedstock is variable compared to traditional fuels such as coal and gas. Waste composition audits of MSW and C&I waste streams have been done to understand the calorific value, or energy content, of the waste feedstock and the variability over time. This has allowed a calorific value to be nominated as the design point for the facility with the thermal treatment technology capable of managing variation in the energy content either side of this design point. **Section 3.4.3 of Chapter 3 Proposal description** describes the feedstock throughput strategy for the proposal and how the feedstock is controlled.

[1] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32010L0075
[2] https://eippcb.jrc.ec.europa.eu/sites/default/files/2020-01/JRC118637_WI_Bref_2019_published_0.pdf

Issues raised	How and where this is addressed in the EIS
Department of Primary Industries (DPI)	
Biosecurity issues to do with the handling of incoming waste feedstock Address potential biosecurity risks (weed, pest and pathogen) and management measures arising from the import and handling of the residual waste feedstock for the facility.	Waste will be delivered to the site by enclosed waste delivery vehicles and will not be uncovered until the contents is tipped into the waste bunker. Because the standard operating procedures to be applied for the proposal and the nature of both the waste stream being processed and the way it is being processed (combustion in an enclosed facility), the BC Act is unlikely to apply to site operations. See **Section 4.4.2** of **Chapter 4 Statutory context**. **Section 5.8** of **Chapter 5 EfW policy** describes the waste inspection, quarantine and rejection process that will occur in the waste receival hall.
Salmonella contamination on site Presence of salmonella onsite was discussed with DPI to remediate the site.	The applicant worked closely with DPI to render the site safe and suitable and has since received a letter from the DPI which confirms that the Individual Biosecurity Direction has been revoked on the proposal site. See **Section 2.5** of **Chapter 2 Strategic context.**
Biosecurity issues to do with vegetation clearing The approach proposed to manage biosecurity issues associated with the clearing of vegetation on the site.	Appropriate weed control and weed disposal will be carried out in line with Biosecurity protocols. Biosecurity measures are listed in Section 8 of the Vegetation Management Plan included as Appendix G of **Technical report Q Biodiversity Development Assessment Report.**
Environment, Energy and Science (DPIE)	
Information requirements for the BDAR Requested that BDAR calculations and shapefiles are included in the EIS.	All shapefiles and calculations are included in **Technical report Q Biodiversity Development Assessment Report**.

Issues raised	How and where this is addressed in the EIS
Offset requirements for State Significant Developments The interpretation of section 7.14 (3) of the *Biodiversity Conservation Act 2016* (BC Act) was discussed and whether there is a mandatory offset requirement for State Significant Development.	The proposal doesn't need offsets as outlined in **Section 21.3.5** of **Chapter 21 Biodiversity** and **Section 8.1** of **Technical report Q Biodiversity Development Assessment Report**.
Transport for NSW (TfNSW)	
Swept path analysis Requested swept path analysis of the intersection movements.	The swept path analysis of the intersection movements is included in Appendix B of **Technical report K Traffic and Transport Assessment Report.**
Site access consultation Requested consultation with landowners regarding access to the site.	The site access carriageway is partially owned by TfNSW and partially owned by WaterNSW. Consultation is ongoing with WaterNSW and TfNSW in finalising site access arrangements. See **Section 22.7** of **Chapter 22 Related development**.
NSW Ministry of Health	
Potential human health impact receivers Describe the approach taken to assessing human health risks	There are three main exposure pathways by which a person may be exposed to a chemical substance emitted from the proposal: (1) inhalation, (2) ingestion, or (3) dermally (through the skin). The human health risk assessment looks at the possible exposure pathways for all pollutants likely to be emitted by the proposal and compared these to the relevant guidelines. The assessment concluded that there would be no unacceptable risks to human health. **Chapter 9 Human health risk** and **Technical report B Human Health Risk Assessment Report** outline the potential human health risk receivers. Note that the approach to the overall design of the WSERRC has been underpinned by the objective to mitigate impacts on the community.

Issues raised	How and where this is addressed in the EIS
Best Available Techniques Interested in understanding old vs. new EfW technologies.	Moving grate is a recognised and proven EfW technology that has been used globally for over 50 years. In that time the technology has been continually improved responding to regulatory, industry and public demands. Over 95% of facilities that thermally treat MSW and C&I waste to produce electricity worldwide use moving grate technology. A summary of the EfW technologies considered for this proposal is available in **Section 2.6.4 of Chapter 2 Strategic context**. **Chapter 5 EfW policy** and **Technical report D Best Available Techniques Assessment Report** outlines the BAT techniques and how they are adopted by the proposal.
Feedstock proposed, compared to other EfW proposals Interested in understanding the nature of the waste streams to be used as a fuel for this EfW proposal compared to issues raised for previous EfW proposals.	The proposal will be designed to thermally treat up to 500,000tpa of residual Municipal Solid Waste (MSW) and residual Commercial and Industrial (C&I) waste streams. **Section 5.4** of **Chapter 5 EfW policy** outlines the feedstock strategy. There are several other EfW facilities proposed to service the Sydney Basin and include the proposed Dial a Dump Industries (DADI) Next Generation facility in Eastern Creek and the proposed SUEZ Botany Cogeneration facility in Matraville. The Next Generation facility EIS states that it will process and thermally treat up to 552,000t of non-putrescible residual waste sourced from construction and demolition (C&D), commercial and industrial (C&I) sources as well as shredder floc. The Botany Cogeneration facility scoping report states that it will process and thermally treat up to 165,000t of feedstock made up of processed engineering fuel (PEF) and residuals from the Orora recycled paper mill. The WSERRC proposal will need to operate within emission limit values set in the EPL. These values set the limits on concentrations of pollutants in the stack before discharge and have been used in the air quality assessment to demonstrate that impacts at receptors are within criteria. The EfW process is designed to operate within these emission limit values (ELVs) while thinking about variations in the composition of waste feedstock. The CEMS will make sure that any exceedances of the ELVs will either be immediately corrected or will result in an automatic shutdown of the operating line.
Engagement conducted to date Interested in understanding the types of consultation that has been conducted by the proposal.	The engagement conducted to date is detailed in **Section 6.1** of this chapter and Section 3 and 4 of **Appendix F Community and Stakeholder Engagement Report**. In response to requests for more information on potential air quality and human health impacts, an Air and Health Citizens Panel was set up, with four sessions.

Issues raised	How and where this is addressed in the EIS
Western Sydney Local Health District	
Feedstock and health impacts Discussions focussed on the feedstock for the proposal, the reference facilities and the health impact assessment approach	The waste feedstock received at the facility will include residual waste that is left over from offsite recycling and resource recovery operations and waste from source-separated collections. The waste feedstock strategy and the reference facilities used in this proposal are detailed in **Chapter 5 EfW policy**. There are three main exposure pathways by which a person may be exposed to a chemical substance emitted from the proposal as a result of thermally treating waste: (1) inhalation, (2) ingestion, or (3) dermally (through the skin). The human health risk assessment looked at the possible exposure pathways for all pollutants likely to be emitted by the proposal and compared these to the relevant guidelines. The assessment concluded that there would be no unacceptable risks to human health. Note that the approach to the overall design of the WSERRC has been underpinned by the objective to mitigate impacts on the community. **Chapter 9 Human health risk** and **Technical report B Human Health Risk Assessment Report** look at the potential impacts of the proposal on human health.
Fire and Rescue NSW (FRNSW)	
No issues raised. FRNSW were satisfied that the information provided to them by email on 6 April 2020 was enough in answering agency thoughts at this time.	FRNSW may provide a submission following public exhibition of the EIS.
Natural Resources Access Regulator (NRAR) (DPIE)	
No response received.	Not applicable.
Sydney Water	
Water demand and capacity Consultation with SW took place to understand if the Sydney Water network could meet potable water demands for the proposal.	The consultation with Sydney Water confirmed there is enough capacity to cater for the proposal peak potable water demand and to supply all fire tanks within the site. Similarly, the proposed connection point on Roussell Road can take the sewer demand generated by the proposal. See **Section 20.3.2** of **Chapter 20 Utilities and services** and Section 4 of **Technical report P Utilities and Services.**

Issues raised	How and where this is addressed in the EIS
Water quality impacts on Prospect Reservoir Assessment needs to think about water quality impacts on Prospect Reservoir.	**Chapter 9 Human health risk** and **Technical report B Human Health Risk Assessment** conclude that there will be no unacceptable risks for rainwater tanks or Prospect Reservoir. There is no downgradient flow path from groundwater beneath the site to Prospect Reservoir. See Section 4.9 of **Technical report F Soils and Water.**
Recycled water Interested to know if the option of supplying the site with recycled water to service the process water demand has been thought about.	The possibility to supply the facility with recycled water to meet the water process demand was thought about in consultation with Sydney Water. The supply of recycled water to the site was not thought feasible because of the lack of existing recycled water infrastructure in the surrounding area. See Section 4 of **Technical report P Utilities and Services**.
Endeavour Energy	
Grid connection Ongoing discussions were had to understand the options for the proposal to connect to the electricity grid.	The WSERRC proposal will be designed to generate up to 58MW of base load electricity some of which would be used to power the facility itself with up to 55MW exported to the grid. To export energy to the grid, the proposal will need a new connection to the electricity grid. These connection works are related development (see **Chapter 22 Related development**). Different options for connection have been discussed with network operators. Three feasible route options to connect WSERRC to the grid have been presented by Endeavour Energy (see Appendix D of **Technical report P Utilities and Services**).
SafeWork NSW	
Dangerous goods stored on site SafeWork NSW was advised of the proposal and the dangerous goods and quantities to be stored onsite.	The types of dangerous goods and quantities to be stored on site are covered in **Section 14.3** of **Chapter 14 Hazard and risk** and Section 2.3 of **Technical report J Preliminary Hazard Analysis**.
Western Sydney Airport Corporation (WSA Co)	
Obstacle Limitation Surface (OLS) and Procedures for Air Navigation Services – Aircraft Operations (PAN-OPS)	The site was selected so that the stack and plume will not intrude into the protected airspace of Western Sydney Airport. See Section 3.2.14 and Appendix G of **Technical report J Preliminary Hazard Analysis.** WSACo has consulted about the OLS and PANS-OPS. WSACo noted that there is no PANS-OPS designed yet for WSA, and while WSACo thinks it is likely that that the PANS-OPS surface will be at or higher than the OLS levels, this won't be known until the detailed airspace design is completed by the Commonwealth. The currently declared protected airspace for WSA is the OLS.

Issues raised	How and where this is addressed in the EIS
Civil Aviation Safety Authority (CASA)	
Plume rise assessment As part of the EIS, a preliminary plume rise assessment needed to be completed which CASA developed. CASA recommended that the plume be modelled for environmental reasons.	CASA made a plume rise assessment which stated that there will not be an infringement of an OLS for Western Sydney Airport. See Section 3.2.14 of **Technical report J Preliminary Hazard Analysis**.
Lighting of the stack CASA noted that lighting and marking of the stack should be in line with Federal Aviation Administration's (FAA) AC 70/7460-1L.	Lighting and marking of the stack will be in line with Federal Aviation Administration's (FAA) AC 70/7460-1L. See Section 3.2.14 of **Technical report J Preliminary Hazard Analysis**.
Bird hazards to aircraft CASA noted that a Bird Hazard Assessment should be completed if the waste material is not contained within a building.	The waste is contained within a building, so no Bird Hazard Assessment is needed.
Department of Agriculture, water and environment (DAWE)	
Matters of national environmental significance (MNES) The EIS should detail all surveys and methods used in reaching conclusion for MNES.	An assessment of whether the proposal may have a significant impact on any MNES or on the environment of Commonwealth land was completed in the preparation of this EIS. This included a search using the Protected Matters Search Tool (PMST) and conclusions from various technical reports, including the findings from the Biodiversity Development Assessment Report (BDAR) (See **Technical report Q**). The assessment determined that the proposal is unlikely to impact any MNES, so a referral will not be made to the Commonwealth Minister for the Environment. Refer to **Technical report Q Biodiversity Development Assessment Report** for the MNES methodology and survey results.

Issues raised	How and where this is addressed in the EIS
NSW Department of Planning, Industry and Environment (DPIE)	
Community engagement during COVID-19 The Department was interested to understand how best to engage the community in COVID19.	Because of the 2020 COVID-19 pandemic and government restrictions, the approach to engagement was modified to rely more on online engagement tools to continue to meet the engagement objectives of the proposal. For example, the third and fourth Air and Health Citizens Panel sessions were changed from a face-to-face interaction to an online environment. Participants and panel members were invited to continue with a new format in an online space, and this move was willingly accepted. Online and virtual interactions are currently being discussed to make sure engagement with stakeholders continues following lodgement of the EIS. Engagement activities have and will take place online as necessary through COVID-19.
EfW in a circular economy Explain the role of EfW in the transition to a circular economy**.**	EfW has a role to play in the transition to a circular economy. As recycling rates increase over time in line with NSW WARR strategy targets, circular economy principles and through market development, EfW operations will need flexibility to accommodate changes in waste feedstock to continue to allow landfill diversion of residual waste. Modelling completed for the proposal indicates that even with the introduction of additional source separation and maximised resource recovery within the Sydney region, there would still be sufficient residual waste feedstock for the proposal. Cleanaway supports increased source separation for high-quality recovery and recycling. The WSERRC feedstock strategy and process design accommodates increased source separation over time, particularly of organics. In this way, the WSERRC proposal expects to accommodate improvements in both recycling and landfill diversion. Materials will be recovered through the EfW process onsite, including metals, which will be sold to metal recyclers, and IBA. IBA will be transferred offsite to a separate facility (to be developed) where further metals recovery is currently intended to take place. Options for the reuse of IBA in construction products replacing virgin materials are being investigated, which would allow these materials to be returned to productive use. In addition, the renewable component of the energy generated by the proposal will displace carbon emissions from fossil fuel sources. The proposal will include the construction of a visitor and education centre to help educate and inform the community on the principles of waste management, waste avoidance, the circular economy, recycling, resource recovery and EfW. **Section 2.5** of **Chapter 2 Strategic context** assesses how the proposal will support Australia's transition to a circular economy in line with the NSW Circular Economy Policy Statement 2019.
Management of the Western Sydney Parklands and planning for the proposal	The vision and future land use for the Western Sydney Parklands is described in the Western Sydney Parklands Plan of Management 2030 which includes plans for each of the 16 precincts. The proposal is consistent with the objectives and future land uses for the Wallgrove Precinct as described in the **Chapter 2 Strategic context**.

Issues raised	How and where this is addressed in the EIS
Nearby landowners, businesses and occupiers that may be affected by the proposal	
Western Sydney Parklands Trust (WSPT)	
Community engagement responses Interested in understanding the feedback from the community (both positive and negative).	For further details about engagement responses see Section 4 of **Appendix F Community and stakeholder engagement report**.
Community Funding Package and Community Reference Group Interested in understanding what the community funding package is, who could access it and what the Community Reference Group is.	A Community Reference Group (CRG) will be formed in construction and function across the life of the proposal. The CRG will be responsible for administering a community funding package, among other duties. If the proposal is approved, a community funding package for Western Sydney is proposed, with the purpose of giving back to the community. Funding contributions would total $150,000 per year and, subject to consultation and a decision by the community reference group (CRG), could be made towards community-based initiatives, development of local sporting infrastructure, community facilities and environmental areas such as tree plantings.
Land use zoning in the WSP and alignment with the WSP Plan of Management	All land in the Parklands is unzoned. All forms of private development other than residential or exempt development are permitted with consent. The vision and future land use for the Western Sydney Parklands is described in the Western Sydney Parklands Plan of Management 2030 which includes plans for each of the sixteen precincts. The proposal is consistent with the objectives and future land uses for the Wallgrove Precinct, including recycling and renewable energy as described in **Chapter 2 Strategic context**. The proposal would be consistent with the Plan of Management by utilising land of low environmental or recreational value for services infrastructure and by providing employment. Refer to **Table 2.3** in **Section 2.5 of Chapter 2 Strategic Context** for further details of how this proposal meets the objectives of the WSP Plan of Management.

Issues raised	How and where this is addressed in the EIS
WaterNSW	
Risks to the Warragamba pipelines corridor WaterNSW stated that the proposal must minimise risk to the Warragamba pipelines. WaterNSW need access to the Pipelines 24 hours a day, 7 days a week.	WaterNSW was consulted to demonstrate how the proposal aligns to the Guidelines for Development Adjacent to the Upper Canal and Warragamba Pipelines. Consultation with WaterNSW regarding access to the proposal site over the Warragamba pipelines is ongoing. A Risk Assessment of the Warragamba pipelines has been prepared and is included as Appendix A of **Technical report P Utilities and Services**.
Site access Site access crossing over the Warragamba pipelines corridor.	Consultation with WaterNSW regarding access to the proposal site over the Warragamba pipelines is ongoing.
Neutral or Beneficial Impact (NorBI) WaterNSW was consulted about the proposed approach to assessing NorBI at Prospect Reservoir.	The proposed approach to assessing NorBI involved the Human Health Risk Assessment (HHRA), including an assessment of deposition of particles from the air emissions of the facility onto the surface of Prospect Reservoir. WaterNSW stated via email dated 12 May 2020 that WaterNSW does not object to the approach but would expect to review the modelling when completed.
Gazcorp	
Planning Gazcorp sought information on the site zoning, if EfW fits within the zoning, who the relevant local government authority is and adjoining sites and land uses.	The State Environmental Planning Policy Western Sydney Parklands 2009 (WSP SEPP) is the principal environmental planning instrument (EPI) controlling development and land use planning in the Parklands. Its aim is to put in place development controls that would enable the Western Sydney Parklands Trust (WSPT) to develop a multi-use urban parkland for Western Sydney. All land in the Parklands is unzoned. All forms of private development other than residential or exempt development are permitted with consent. The provisions of specific Local Environmental Plans (LEPs), including the Blacktown LEP 2015, do not apply to the WSP as per Clause 6 (1) of the WSP SEPP. The WSERRC can be characterised as electricity generating works (EGW), defined in the dictionary to the Standard Instrument Principal Local Environmental Plan (SIPLEP) as '*a building or place used for…making or generating electricity*'. As above, the proposal is consistent with the objectives and future land uses for the Wallgrove Precinct as described in the **Chapter 2 Strategic context**.

Issues raised	How and where this is addressed in the EIS
	The site is bounded by the Westlink M7 Motorway to the west with the Eastern Creek industrial area located farther west. The SUEZ Eastern Creek Waste Management Centre, comprising the now-closed landfill site and operational organics recycling facility is located to the north and north-east, with the operational Global Renewables waste management facility located immediately to the east. To the south, the site is bounded by the Warragamba Pipeline Corridor, with the Austral Bricks facility located farther south**.**
Synergies with nearby industries Explain the opportuntieis for power and heat offtake from the proposal.	The sites location is favourable because of the industrial nature of the surrounding land uses, creating the potential for synergies with surrounding industry.
Wallgrove Road intersection Gazcorp advised that a detailed design is underway for an upgraded intersection on Wallgrove Road.	The traffic assessment modelled the proposed construction traffic against the Gazcorp Industrial Estate proposed intersection upgrades at Wallgrove Road and Austral Bricks Road intersection. The results showed that even with the proposal's construction traffic, the same level of service would be maintained for the intersection. All construction vehicles would be able to park onsite, so avoiding offsite parking impacts on the road network. Refer to **Technical report K Traffic and Transport Assessment Report**.
Austral Bricks	
Road upgrades Options to upgrade a section of Austral Bricks access road were discussed to connect to a new crossing location, further east of Wallgrove Road.	Alternative site access arrangements were thought about as part of the site layout, this is discussed in **Section 2.6.7 of Chapter 2 Strategic context**.
SUEZ	
Right of carriageway The strip of land dividing the site is owned by SUEZ and includes a right of carraigeway, benefitting the proposal site.	The 8.23ha site is divided by a small strip of land not part of the proposal site, resulting in a 2.04ha northern section and a 6.19ha southern section (**Figure 1.3** of **Chapter 1 Introduction**). This dividing strip is part of the adjacent lot owned by SUEZ and includes a right of carriageway, benefitting the proposal site, allowing vehicles to move between the two parts of the site.

Issues raised	How and where this is addressed in the EIS
Global Renewables Limited (GRL)	
Overland flow path A site walkover on the GRL site found the existing drainage regime.	The overland flow path is discussed in detail in **Chapter 12 Hydrology and flooding.**
Other stakeholders (not specifically mentioned in the SEARs)	
Airservices Australia	
Plume rise Airservices undertook an Airservices assessment and had no objections to the proposed plume rise and exhaust stack.	Airservices Australia has taken on an Airservices assessment and concluded that it has no objections to the proposed plume rise and exhaust stack. See **Section 14.3** of **Chapter 14 Hazard and risk** and Section 3 of **Technical report J Preliminary Hazard Analysis.**
NBN	
Fibre to the premises (FTTP) connection NBN confirmed that a FTTP connection is feasible.	Consultation with NBN has confirmed that an FTTP connection is feasible. See Section 4 **Technical report P Utilities and Services.**

6.3.2 Community stakeholder feedback

Engagement with the community discovered issues of interest and concern to the community. **Table 6.4** below summarises the key issues raised by the community stakeholders and how and where these issues have been discussed in the EIS.

Additional information about the proposal is available to the community and other interested stakeholders at www.energyandresourcecentre.com.au.

Table 6.4:Community stakeholder issues raised and where this is addressed in the EIS

Issue, concerns and questions raised	How and where this is addressed in the EIS
Project need and location	
The need for the proposal Explain the need for the proposal and how it compares to landfill.	The NSW Waste Avoidance and Resource Recovery Strategy 2014–2021 sets a target to increase waste diversion from landfill to 75% and to increase recycling of MSW and C&I waste by 70% by 2021–2022. It notes that reuse and recycling will remain the main avenues for diverting waste from landfill, supplemented by energy recovery. Actual recycling rates for MSW in the Sydney Metropolitan Levy Area (MLA) are currently short of this target, declining from 52% in 2010–2011 to 42% in 2017–2018. Initiatives to increase recycling in the long-term through better source separation of waste and embedding circular economy principles in the design of products and materials will increase diversion from landfill. EfW facilities such as WSERRC will play a main role in diverting waste from landfill in this transition. Even as recycling increases in response to the functioning of circular economy principles, EfW will need to manage the residual waste that remains. Energy recovery is a higher order use of resources on the waste hierarchy compared to landfilling, reflecting the environmental and amenity impacts of landfill. As landfill airspace declines and with limited opportunities to expand existing or develop new landfills, existing landfill airspace should be used for residual waste that cannot be used as a higher order use in the waste hierarchy. More information can be found in **Chapter 2 Strategic context**.
The need for the proposal If the Next Generation EfW proposal proceeds (currently before the NSW Land and Environment Court), will this remove the need for WSERRC?	An analysis of the waste tonnes currently disposed to landfill is given in **Chapter 2 Strategic context.** WSERRC is targeting about 15% of the available (or currently landfilled) waste tonnes, confirming that there are enough available tonnes for other EfW proposals, should they proceed.
Site selection Explain the site selection process and how this site was selected	A site screening analysis was done between July 2018 and October 2019. Main reasons in selecting an EfW site include proximity to waste sources, separation distances to existing and future residential areas, access to transport and power infrastructure and compatibility with surrounding land uses. The site is in a region that is expected to accommodate most of the population growth forecast for Sydney, driven in part by the development opportunities created by the Western Sydney Airport and Western Sydney Aerotropolis.

Issue, concerns and questions raised	How and where this is addressed in the EIS
	The location of the site in this growth region and close to existing waste management infrastructure such as the Erskine Park Waste Transfer Station will minimise the transport distances between the sources of waste, waste processing facilities and the proposal. Mainly, the location of the site avoids impacts on the protected airspace of the Western Sydney Airport. The proposal site is located around 1km from the nearest residential areas. The risk of future encroachment is reduced by its location in the Western Sydney Parklands and adjacent to the Western Sydney Employment Area, both of which prohibit residential development. The site is immediately adjacent to the M7 and close to power supply infrastructure and is in an area that has and continues to be used for waste management facilities. It is consistent with the Wallgrove Precinct Plan, part of the Western Sydney Plan of Management, which classifies recycling and renewable energy as future land use opportunities in the Precinct. More information is available in **Chapter 2 Strategic context**
Waste management	
Best practice in waste management How does the proposal fit within a context of best practice in waste management?	**Chapter 2 Strategic context** explains the role of EfW as part of an integrated waste management strategy, both internationally and within Australia. It describes how the proposal contributes to the objectives and targets of the NSW EPA's Waste Avoidance and Resource Recovery Strategy for landfill diversion and recycling by introducing a new technology that recovers valuable energy, while reducing landfill disposal. **Chapter 5 EfW policy** describes the EU framework for Best Available Techniques (BAT) and how the proposal aligns with this framework. It also describes the operating procedures to control the type of waste feedstock that enters the combustion process, including compliance with the resource recovery criteria of the NSW Energy from Waste Policy Statement which requires the waste feedstock to be residual from higher order resource recovery activities. The EfW technology was chosen because of its ability to deal with changes to feedstock. As recycling rates increase over time in response to greater source separation and functioning of circular economy principles in the design of products and materials, the proposal will continue to play a role in the management of residual waste. More information is available in **Chapter 2 Strategic context** and **Chapter 5 EfW policy**.
Recycling Will EfW remove the need for recycling?	**Section 2.2** of **Chapter 2 Strategic context** describes the role of recycling and the EfW processes in the waste hierarchy. The WSERRC proposal is not an alternative to recycling. Rather, it is part of an integrated waste management strategy for New South Wales, complementary to the other steps in the waste hierarchy and contributing to the *Waste Avoidance and Resource Recovery Act 2001* targets. For materials that are unsuitable for recycling, energy recovery is the preferred option.

Issue, concerns and questions raised	How and where this is addressed in the EIS
	Long-term moves to increase recycling through better source separation of waste and embedding circular economy principles in the design of products and materials will increase diversion from landfill. EfW facilities such as WSERRC will play a main role in diverting waste from landfill in this transition. Even as recycling increases in response to the functioning of circular economy principles, EfW will be needed to manage the residual waste that remains. Cleanaway is committed to increasing recycling and resource recovery. In 2018, it recycled more than 380,000t of paper and cardboard, 15,500t of plastic, and 25,000t of steel and aluminium. Cleanaway captured more than 115Mm^3 of landfill gas and generated over 135GWh of renewable energy, enough to power more than 27,000 homes. The proposal will include building a visitor and education centre, to help educate and inform the community on the principles of waste management, waste avoidance, the circular economy, recycling, resource recovery and EfW. More information is available in **Chapter 1 Introduction** and **Chapter 2 Strategic context**.
Resource recovery before combustion Describe the waste feedstock and what level of pre-sorting and recycling takes places before being sent to the facility? If materials are combusted that are not meant to be in the red bin, what happens to air quality?	Waste feedstock delivered to the facility will be residual from a waste processing facility that recovers material from the waste stream for recycling. Where waste streams are separated at source in line with the EfW Policy Statement, this waste may be sent directly to the facility without the need for further processing. **Section 3.4.6** of **Chapter 3 Proposal Description** describes the waste delivery process and **section 5.8** of **Chapter 5 EfW policy** outlines the process for inspection, quarantine and rejection procedures for unacceptable waste. All waste deliveries will come from suppliers approved by the proposal. This means that all suppliers will have to pre-qualify before they can enter the site. Pre-qualification will include steps so that the waste being delivered is suitable for combustion within the facility and complies with the NSW Energy from Waste Policy Statement and other licence and legislation conditions. **Section 5.4** of **Chapter 5 EfW policy** describes the feedstock strategy for the proposal. The proposal will use waste from residual Municipal Solid Waste (MSW) and residual Commercial and Industrial (C&I) waste streams that would otherwise be sent to landfill. The flue gas system has been designed to incorporate a wet scrubber and other measures, to achieve current international BAT. The flue gas treatment process is designed to manage instances where small quantities of unacceptable waste enter the process. With these systems in place, it is still unlikely that hazardous waste will enter the combustion process, and if they did, the EfW process can treat this waste while maintaining licensed emission limits.

Issue, concerns and questions raised	How and where this is addressed in the EIS
Reducing waste There should be a focus on reducing waste and encouraging recycling, not creating EfW.	The WSERRC proposal is not an alternative to recycling. Rather, it is part of an integrated waste management strategy for New South Wales, complementary to the other steps in the waste hierarchy and contributing to the *Waste Avoidance and Resource Recovery Act 2001* targets. Cleanaway is committed to increasing recycling and resource recovery through education on waste avoidance, reuse and best practice recycling. In 2018, it recycled more than 380,000t of paper and cardboard, 15,500t of plastic, and 25,000t of steel and aluminium. Cleanaway captured more than 115Mm^3 of landfill gas and generated over 135GWh of renewable energy, enough to power more than 27,000 homes. The visitor and education centres purpose is to help educate and inform the community on the principles of waste management, waste avoidance, the circular economy, recycling, resource recovery and EfW. For materials that are unsuitable for recycling, energy recovery is the preferred option. The EfW process typically leads to about a 90% reduction in the volume (or 80% reduction in mass (tonnes)) of waste that would otherwise go to landfill. If Incinerator Bottom Ash is reused into construction products, this number increases further to about 95% reduction in volume and mass of waste that would otherwise go to landfill. More information is available in **Chapter 2 Strategic context.**
Operational	
Electrical generation process What is the process of energy generation at the facility?	Electricity is generated by creating heat through the thermal treatment of waste feedstock. The heat is used to generate steam from a boiler which is used to drive a turbine. The turbine generates electricity, most of which is exported to the grid with a small amount used to power the facility. More information is available in **Chapter 3 Proposal description**
Heat Will the proposal emit heat and if so, will it impact surrounding communities?	As with all buildings, heat will be emitted into the air from the ventilation system. Additionally, the air-cooled condenser will emit heat. However, any heat added will be negligible, quickly dissipating and will not cause a temperature increase in the surrounding communities. More information is available in **Chapter 3 Proposal description**.
Heat and steam Can the heat and steam that is produced also be reused?	The facility has been designed to allow heat or steam to be exported directly to nearby industrial users, with further work underway to assess potential users.

Issue, concerns and questions raised	How and where this is addressed in the EIS
Residual ash management What are the by-products of the EfW process, how are they managed and can the by reused?	The thermal treatment of waste creates certain by-products, including: 1. Incinerator Bottom Ash (IBA) 2. Boiler Fly Ash 3. Flue Gas Treatment residues (FGTr). It is the intention that IBA will be transported offsite to an ash management facility which is not part of the scope of the WSERRC proposal and will be subject to a separate planning approval process as described in **Chapter 22 Related development**. Some metals recovery from the ash will be carried out onsite (at WSERRC), with additional metals recovery carried out at the offsite ash management facility. A portion of the boiler fly ash will be managed with the IBA. Options are also being investigated to reuse the IBA in construction products in line with practices in other countries. In the worst case, if a suitable reuse route cannot be found in Australia, IBA will be disposed of at a licensed landfill in New South Wales. FGTr and the remaining portion of the boiler fly ash will be treated at an existing offsite waste treatment facility before disposed to a licensed landfill. About 80,000tpa of IBA will be generated and about 20,000tpa of FGTr and boiler fly ash. More information is available in **Chapter 3 Proposal description** and **Chapter 22 Related development.**
Water use in the EfW facility What is the role of water in the EfW process and how it is managed to avoid any offsite impacts?	Water uses include boiler make up-water, flue gas conditioning pre-treatment and IBA quenching. The main objective regarding water use is to reuse as much water as possible. Water from the wet scrubber outlet will be captured and used within the flue gas conditioning stage. Rejected water from the make-up plant and from boiler blow-down will be used within the IBA quench. This means that no wastewater generated onsite will need treatment outside of the facility in normal operation. A small water treatment plant will be installed so that the water quality of feedwater is suitable for use within the boiler. More information is available in **Chapter 3 Proposal description**.
Timeframe for operations	The facility is intended to operate 24 hours a day, 7 days a week but will include downtime periods for maintenance as described in **Chapter 3 Proposal description**.

Issue, concerns and questions raised	How and where this is addressed in the EIS
Timeframe for construction What is the timeframe from approval to operation?	Pending approval, detailed design and construction activities are expected to take about 39 months, subject to any external unforeseen delays.
How long will the plant operate for? How long is the approval for the proposal, and what happens to the facility after that period?	EfW facilities have typical operational lives of about 30 years. Towards the end of the operational life of the proposal, the facility will be evaluated in terms of its need and ongoing role in the waste management industry.
Environmental	
Air quality assessment and compliance with international best practice/regulations in relation to air quality and health How does the proposal meet international standards for EfW technology, air quality and health? Explain the approach to and outcomes of the air quality assessment and how it performs against impact assessment criteria and international standards.	The proposal has been designed to meet the European Industrial Emissions Directive (IED) and the associated Best Available Techniques Reference (BREF) document which sets the European Union environmental standards for waste incineration as published on 3 December 2019. The EU Commission Implementing Decision (2019/2010) on the 12 November 2019 states the best available techniques (BAT) conclusions as the main element of the BREF and prescribes them to be adopted by Member States. Additionally, the facility will comply with the technical criteria set out in the NSW EfW policy – refer to **Chapter 5 EfW policy**. The emissions standards and the BAT that can achieve these standards, as described in the BREF, are recognised as current international best practice. The Air Quality and Odour Impact Assessment has analysed how the proposal performs against the BREF and *NSW Protection of the Environment Operations Act 1997* requirements and demonstrates that under every operating scenario, the facility complies with relevant criteria. The odour assessment indicates that odour levels because of the proposal will be at or below the applied odour assessment criteria at all assessed receptors. More information is available in **Chapter 5 EfW policy**, **Chapter 8 Air quality and odour** and **Chapter 9 Human health risk**.

Issue, concerns and questions raised	How and where this is addressed in the EIS
Carbon emissions and climate change What are the CO_2 reduction benefits?	It is estimated that the proposal would result in a net reduction in greenhouse gas emissions of around 390,000t CO_2-e in its first year of operation. This covers the greenhouse gas emissions generated by the facility and the greenhouse gas savings which result from the diversion of waste from landfill and the export of electricity, part of which is categorised as renewable, back to the grid. More information is available in **Chapter 18 Greenhouse gas and energy efficiency**.
Hazardous materials How are dangerous goods managed on site?	**Chapter 14 Hazard and risk** lists the dangerous goods to be used and stored onsite and the management measures proposed to mitigate and avoid any hazards and risks. This includes the separation of storage areas for hazardous and dangerous goods that should not be mixed, as well as bunding of storage areas to contain any leaks. The site managers will develop a response plan which includes coordination with local response organisations, such as Fire and Rescue NSW and NSW Ambulance services. **Section 3.4.6** of **Chapter 3 Proposal description** describes the waste delivery process and **section 5.8** of **Chapter 5 EfW policy** outlines the process for inspection, quarantine and rejection procedures for unapproved waste, including hazardous waste. All waste deliveries will come from suppliers approved by the proposal. This means that all suppliers will have to pre-qualify before they can enter the site. Pre-qualification will include steps to make sure that the waste being delivered is suitable for combustion within the facility and complies with the NSW Energy from Waste Policy Statement and other licence and legislation conditions. More information is available in **Chapter 14 Hazard and risk** and **Chapter 3 Proposal description**.
Fire How is fire risk managed onsite?	Fire risk will be managed through various fire and emergency measures, including thermal imaging cameras to detect hotspots in the waste bunker; strategically located fire suppression at key points around the facility, including fire hydrants, fire extinguishers, water cannons and sprinkler systems; facility-wide vacuum cleaning system to reduce the likelihood of dust build-up; sufficient ventilation of the IBA building and gas sensors and alarms; real-time monitoring to detect leaks, and fire detection systems throughout the facility. These measures will be further developed in the detailed design and in consultation with FRNSW. More information is available in **Chapter 3 Proposal description**.
Fire Is the facility at risk from a bush fire?	The site is not mapped as being at risk of bushfire – it is not mapped as Bush Fire Prone Land (BFPL).

Issue, concerns and questions raised	How and where this is addressed in the EIS
Cumulative impacts Has the proposal assessed potential cumulative impacts with other proposals?	A detailed and quantitative cumulative air quality impact assessment was done to assess the air quality impacts of the proposal with The Next Generation EfW facility, currently before the NSW Land and Environment Court. This was done by incorporating the expected emissions from The Next Generation proposal to the background air quality levels for the purposes of the air quality assessment of the proposal. Predicted maximum cumulative concentrations are below the relevant criteria, except for annual average PM2.5 concentrations and 24-hour average PM2.5 and PM10 concentrations. In these cases, the exceedance is because the existing background level is above the criteria already. The existing exceedances trigger the application of an alternative EPA assessment method referred to as 'Level 2 assessment – Contemporaneous impact and background' as explained further in **Technical report A Air Quality and Odour Impact Assessment**. This method thinks about the change in the number of days which experience an exceedance of criteria as a result of the proposal. The results of this assessment indicate that the proposal does not increase the number of days above the 24-hour average criterion at the assessed receptors for PM2.5 and PM10. The incremental results show that the maximum 24-hour average PM2.5 and 24-hour average PM10 concentrations are small. As such, the proposal is expected to have a small influence at the assessed receptor locations which in most cases would be difficult to notice beyond the expected background level. In addition, a qualitative cumulative impact assessment of the proposal with other confirmed projects within a 3km radius of the proposal was done. Impacts from other projects have been found that have the potential to overlap with impacts from the proposal, and where possible, measures to mitigate those impacts have been developed. More information is available in **Chapter 8 Air quality and odour** and **Chapter 22 Cumulative impacts.**
Potential interference with aviation How was potential impact on the protected airspace of Western Sydney Airport assessed?	Details of the proposal were provided to the Civil Aviation Safety Authority (CASA), to allow an assessment of the potential impact on the plume risk from the stack on aviation operations. A summary of the CASA Plume Rise Assessment was received on 28 April 2020 and can be found in Appendix D to **Technical report J Preliminary Hazard Analysis**. The summary states that '*based on the information presented and assumed, there will not be an infringement of an Obstacle Limitation Surface for Western Sydney Airport (WSA). CASA recommends that an Acceptable Level of Safety will be achieved'*. An assessment against the National Airport Safeguarding Framework (NASF) was also done and concluded that the proposal did not pose any unacceptable risks to aviation operations. More information is available in **Chapter 14 Hazards and risks**.

Issue, concerns and questions raised	How and where this is addressed in the EIS
Air quality impact in combination with WSA	Western Sydney Airport (WSA) is at least 15km away from the proposal, so potential cumulative impacts were not considered with this proposal. A review of the WSA impact assessment shows that it would not affect the background concentration levels for air quality near the proposal as noted in **Technical report A Air Quality and Odour Impact Assessment**.
Air quality during a bush fire? What impact does the proposal have on air quality in a bushfire?	The air quality and odour impact assessment has analysed the potential impact of the proposal on existing air quality and found the impacts to be within all applicable criteria. The main air quality impacts associated with a bushfire event is an increase in particulates. The contribution of the proposal to particulates would be negligible in the context of particulate emissions from a bushfire. So, the facility will continue to operate in a bushfire.
Impacts on biodiversity How will the flora and fauna be impacted by the proposal?	The proposal will involve clearing of around 0.45ha of native vegetation. An assessment of the proposal's impact on nearby flora and fauna was completed. The overall landscaping plans for the proposal site will see the replacement of poor-quality vegetation with new native planting, expanding the urban tree canopy and restoration of Cumberland Plains Woodland species. The proposal will also rehabilitate the overland flow path, with beneficial impacts on water quality discharging to Reedy Creek and Eastern Creek. More information is available in **Chapter 18 Biodiversity**.
Meteorology How is data on meteorological conditions used in the air quality assessment?	The air quality assessment uses meteorological data from the Horsley Park Equestrian Centre Automatic Weather Station, to understand how emissions from the facility would disperse in the Western Sydney air shed. More information is available in **Technical report A Air Quality and Odour Impact Assessment**.
Landfill emissions comparison What is the equivalent amount of emissions and pollutants compared to landfill?	The diversion of waste which would otherwise be disposed to landfill will result in the reduction of methane gases produced in the decomposition process of landfilled waste. Calculations have been made to determine the comparable emissions generated from disposal of the same volume of waste to landfill, these are presented in **Chapter 18 Greenhouse gas and energy efficiency** and **Technical report N Greenhouse Gas and Energy Efficiency.**

Issue, concerns and questions raised	How and where this is addressed in the EIS
Emissions monitoring and testing How will emissions from the facility be monitored?	Each line will be equipped with a Continuous Emissions Monitoring System (CEMS) for continuous monitoring of the flue gas. CEMS will feed real time data to the control systems which will automatically adjust the combustion system and the injection rates for the flue gas cleaning system process, keeping the proposal compliant with its licence emission limit values. Before starting operations, Proof of Performance trials will be done in line with an agreed plan, to test all major process components, including emission controls, and demonstrate compliance with approved criteria. More information is available in **Chapter 3 Proposal description**.
Flue Gas Treatment What is the emissions treatment process, including back-up procedures if any part of the process fails?	The EfW facility will be capable of managing the flue gases in line with the emissions limits as set out in the Industrial Emissions Directive (IED) and the associated BREF and the *Protection of the Environment Operations Act 1997*. Emission Limit Values (ELVs) can be found in **Technical report A Air Quality and Odour Assessment Report**. The flue gas treatment system as described in **Chapter 3 Proposal description** is made up of several discreet parts. The facility has been designed such that enough redundancy is in place for continuous flue gas monitoring and cleaning. In the extremely unlikely event of a failure that leads to the monitoring system recording a consistent increase in emissions towards the ELV, the facility will be shut down until the issue can be rectified.
Human health impact What community health data is available?	Community health data for the Western Sydney Local Health District is available from NSW Health and is presented in the **Technical report B Human health risk assessment**. The original data is available at http://www.healthstats.nsw.gov.au/ Regular (usually fortnightly) updates to the website occur, to add new indicators and to update data on existing indicators.
What is the human health impact of the proposal?	**Chapter 9 Human health risk** and **Technical report B Human Health Risk Assessment** assess the potential impacts of the proposal on human health. The impact assessment has concluded the following: • No unacceptable risks for criteria pollutants (NO_x, SO_x, CO, $PM_{2.5}$ and PM_{10}) – from the facility alone or in changing the background/existing levels • No unacceptable risks for short-term or long-term exposures from the proposed facility • No unacceptable risks for rainwater tanks or Prospect Reservoir • The transport of waste will have minimal changes to the existing situation along the proposed route, so no change in health impacts is expected.

Issue, concerns and questions raised	How and where this is addressed in the EIS
Noise impact What are the potential noise impacts from the proposal?	**Chapter 13 Noise and vibration** and **Technical report I Noise and Vibration Impact Assessment** evaluate the potential noise and vibration impacts from the proposal. The operational assessment showed that all plant and equipment can be designed to comply with recognised criteria. The construction assessment showed that while specific activities and work schedules are not yet known, noise management levels might be exceeded, and that mitigation and management measures are expected to be developed further in a Construction Noise and Vibration Management Plan, to be prepared before starting works.
Traffic impact What are the potential traffic impacts from the proposal?	Transport impacts are assessed in **Chapter 15 Traffic and transport** and **Technical report K Traffic and Transport Assessment Report**. While there will be additional traffic generated by the proposal, the assessment of the network, including the two nearest intersections to the proposal, indicates the same level of service that currently exists will be maintained.
Visual amenity What will the proposal look like and what are the potential visual impacts?	Details of the proposal, including visual representations, are included in **Appendix B Architecture and Landscape Design Strategy Report** and **Appendix C Drawings**. An assessment of landscape character and visual amenity impacts are included in **Chapter 16 Landscape and visual**. Most impacts are assessed as either negligible, low or moderate to low, with some assessed as high to moderate.
Impacts on Drinking Water What is the potential impact to Sydney's drinking water supply, Prospect Reservoir and domestic water supplies, such as rainwater tanks/dams?	**Technical report B Human Health Risk** covers the potential impact of the proposal on sources of drinking water, such as the Prospect Reservoir and household rainwater tanks. The assessment concluded that the estimated concentrations in Prospect Reservoir as a result of the proposal are at least 5000 times lower than the individual drinking water guidelines that apply to each pollutant. For rainwater tanks, the total risk related to using water from a rainwater tank is at least 2000-fold lower than the relevant guidelines.
Site licence, measuring and reporting Describe how the environmental performance of the site will be regulated and monitored.	**Chapter 4 Statutory context** outlines the licences needed for the proposal. *The Protection of the Environment Operations Act (POEO) 1997* is the main legislation regulating pollution control and management of waste. Persons carrying out scheduled activities must hold an Environment Protection Licence (EPL) which controls managing and reporting on the environmental performance of an activity.

Issue, concerns and questions raised	How and where this is addressed in the EIS
	The proposal will be a scheduled activity for the purposes of the Act and will need an EPL. The relevant activities in Schedule 1 of the POEO Act include: • Energy recovery from general waste (Clause 18) • Thermal treatment of general waste (Clause 40) • Waste storage (Clause 42) • Operational data from the CEMS will be recorded, stored, reported to the EPA and published in compliance with the facility EPL conditions. Periodic monitoring of additional pollutants not recorded in the CEMS will be conducted and reported in line with the facility EPL conditions. • The EPA completes audits to determine if facilities are publishing pollution monitoring data as set out in section 66(6) of the POEO Act.
Site auditing, breaches, incidents Describe the process for detecting and responding to potential exceedances of regulated criteria and how information on exceedances will be reported?	The conditions of consent and EPL will create a framework for auditing of the operations and environmental performance of the facility and reporting of incidents. The EPL will oblige the facility to report on the environmental performance of the facility, including through the CEMS. More information is available in **Chapter 3 Proposal description.**
Community and social issues	
Community impacts How have impacts on the community been avoided and what benefits will the community get from the proposal?	The site was carefully selected as the preferred site, following a detailed site selection study. The main aim was to avoid impacts on existing and planned residential areas and rural land uses through physical separation and internal best-practice emission control measures. The site is in a region that is expected to accommodate most of the population growth forecast for Sydney, driven in part by the development opportunities created by the Western Sydney Airport and Western Sydney Aerotropolis. The location of the site in this growth region and close to existing waste management infrastructure such as the Erskine Park Waste Transfer Station will minimise the transport distances between the sources of waste, waste processing facilities and the proposal. The need for EfW as part of an integrated waste management strategy and the associated environmental benefits are described in **Chapter 2 Strategic context.** Potential positive and negative social impacts of the proposal are described in **Chapter 17 Social impacts**.

Issue, concerns and questions raised	How and where this is addressed in the EIS
Community benefits What benefits will the community get from the proposal?	**Chapter 6 Community engagement** (this chapter) describes the approach to engagement, including formation of a community reference group (CRG) as the basis of long-term engagement with the community. The CRG will also be responsible for administering a community funding package. If the proposal is approved, a community funding package for Western Sydney is proposed, with the purpose of giving back to the community. Funding contributions would total $150,000 per year and, subject to consultation and a decision by the community reference group (CRG), could be made towards community-based initiatives, development of local sporting infrastructure, community facilities and environmental areas such as tree plantings. The applicant has included in the EIS (**Appendix G**) a letter of offer and draft terms for a Voluntary Planning Agreement (VPA) to be entered into with Blacktown City Council under clause 7.4 of the *Environment Planning and Assessment Act 1979*. Should Blacktown City Council wish to pursue the offer for a VPA, the VPA shall be publicly exhibited for 28 days, in line with the *Environment Planning and Assessment Act 1979,* before determination of the proposal.
Employment What number and type of jobs will be generated by the proposal?	It is estimated that the proposal will create 900 direct construction jobs over the 3-year construction period and additional 700-1200 indirect construction jobs. Further, 50 highly skilled jobs will be created locally in operation. The proposal will also need and create new skill sets and employment opportunities in Western Sydney not otherwise currently available in the region.
Community involvement Explain the community consultation process to date, issues raised, how these issues have been addressed, and plans for ongoing consultation.	The community engagement conducted to date is summarised in **Chapter 6 Community engagement** (this chapter) and **Appendix F Community and Stakeholder Engagement Report**. Future and ongoing engagement is discussed in **Section 6.4** of this chapter.

6.4 Ongoing and future consultation

The applicant will continue to seek feedback from businesses, residents, government agencies and other key community stakeholders as the design progresses.

6.4.1 Consultation following lodgement of the EIS

Engagement activities will be held in the public exhibition of the EIS. Following the exhibition period, the Department will collate submissions and pass them to the applicant.

A response to submissions report will then be prepared, setting out the proposal's response to the issues raised, including any changes to the design of the proposal. This report will be published, and the Department will notify those who made submissions.

If necessary, additional environmental assessment will be carried out, either to present more information or in response to design updates. Equally, if the environmental assessment discovers the need to modify the design, this will also be considered in the response to submissions report.

Because of COVID-19, information exchange and engagement with the community is likely to take place virtually. Other forms of digital communication, such as media releases, social media updates and WSERRC website updates will be used to help facilitate community participation.

6.4.2 Consultation during construction and operation

The following engagement tools will be used for ongoing consultation throughout the construction and operation of the proposal:

- A Community Reference Group will be established and will meet while the site is under construction and in the first two years of operation (see more details below)
- A regular email update will be distributed to the database of people interested in the proposal
- The WSERRC website will remain a current source of information
- The onsite visitor and education centre will help with educating and informing the community on the principles of waste management, waste avoidance, the circular economy, recycling, resource recovery and EfW.
- An annual open day at the WSERRC will be held
- Monitoring data from the proposal will be sent to the EPA. A summary of continuous monitoring data and compliance with emissions limits will be published on the WSERRC website.

6.4.3 Community reference group and funding package

A Community Reference Group (CRG) will be formed during construction and will function across the life of the proposal. The purpose of the CRG will be to help long-term relationships with the community and enable a forum for discussion of community concerns related to construction and operation of the facility, information requests, and local initiatives and partnerships. In addition to general CRG duties, it is anticipated that the CRG will also manage the allocation of the community funding package in line with an agreed governance framework. The CRG will be made up of community representatives, local stakeholders and council representatives, and meetings will be facilitated through an independent facilitator. It is likely that this group will be refreshed every two years to give a variety of community and other stakeholders the opportunity to participate.

If the proposal is approved, a community funding package for Western Sydney is proposed, with the intention of giving back to the community. Funding contributions would total $150,000 per year and, subject to consultation and a decision by the CRG, could be used towards community-based initiatives, such as development of local sporting infrastructure, community facilities and environmental areas such as tree plantings.

6.4.4 Voluntary Planning Agreement

The applicant has included in the EIS (**Appendix G**) a letter of offer and draft terms for a VPA to be entered into with Blacktown City Council (BCC) under clause 7.4 of the *Environment Planning and Assessment Act 1979*.

Should BCC wish to pursue the offer for a VPA, the VPA would be publicly exhibited for 28 days, in line with the *Environment Planning and Assessment Act 1979,* before determination of the proposal.

This is separate to the community funding package referred to above.

Chapter 7

Environmental assessment scope

7 Environmental assessment scope

7.1 Overview

The Scoping Report issued to the Department to support a request for SEARs included an environmental risk assessment of the likely environmental impacts of the proposal and the proposed approach to assessment in the EIS based on the available information about the site and the proposal at that time. This chapter updates the environmental risk assessment to confirm the scope of the assessment for the EIS, outlining 'key' and 'other' issues based on more detailed site analysis, environmental assessment and design information.

7.2 Existing environment

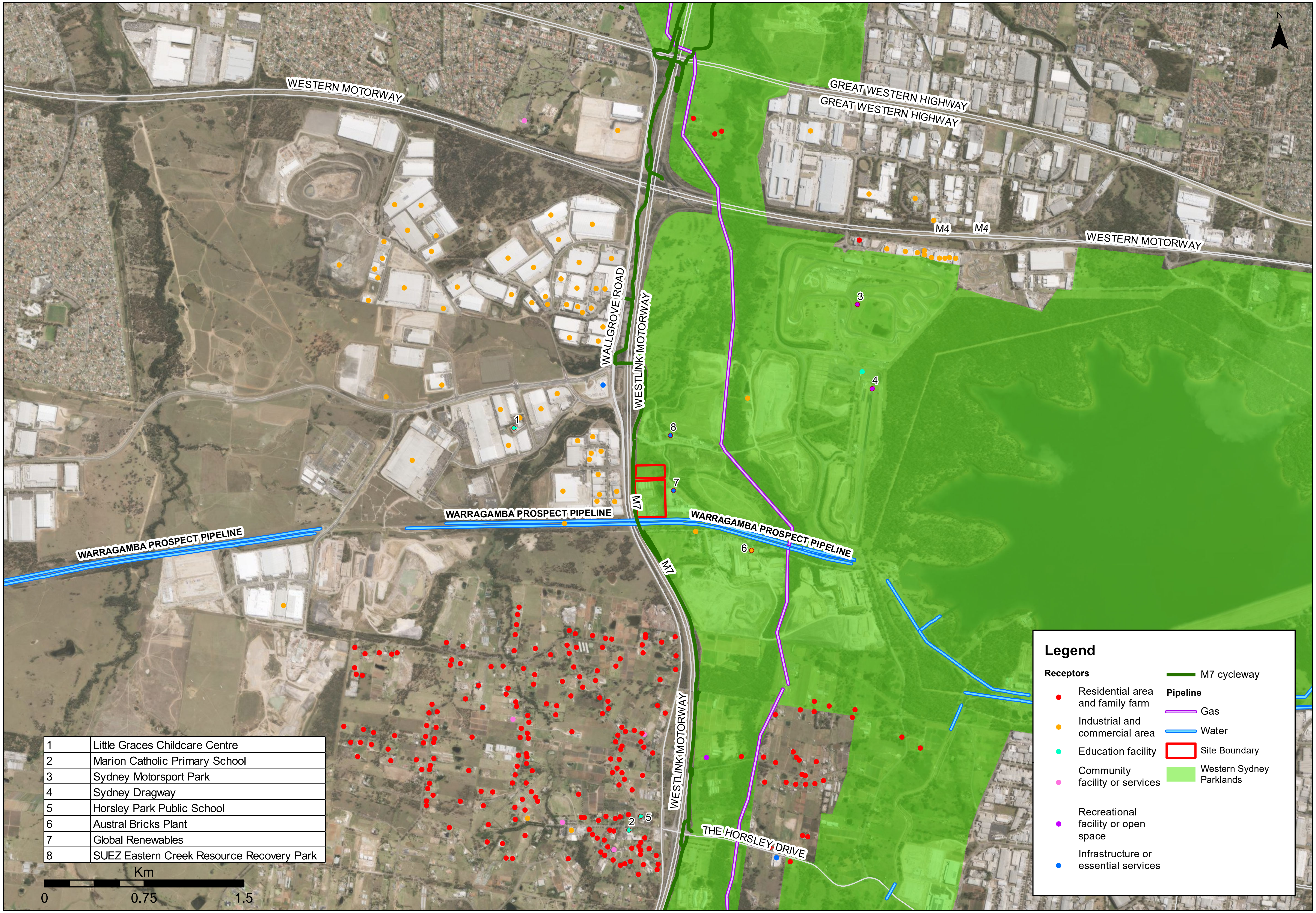
Section 1.2 of **Chapter 1 Introduction** provides the site description. In the same chapter, **Figure 1.2** shows the surrounding area and local context of the site. The nearest residential area is located around 1km to the south of the site in Horsley Park with the Minchinbury residential area located around 3km to the north-west. Horsley Park Public School is located over 2km south of the site and a childcare centre is located within the Eastern Creek industrial area about 1km to the west of the site.

The site is bounded by the Westlink M7 Motorway to the west with the Eastern Creek industrial area located farther west. The now-closed Eastern Creek landfill site, which still has an operational organics recycling facility component, is located to the north and north-east, with the operational Global Renewables waste management facility located immediately to the east. To the south, the site is bounded by the Warragamba Pipeline Corridor with the Austral Bricks facility located farther south.

Table 7.1 below summarises the nearest receivers within a 3km radius to the proposal that may be affected by the development. These are shown on **Figure 7.1**

Table 7.1: Environmental receivers

Receivers
Residential areas The nearest residential area is the Horsley Park rural residential area, located about 1km to the south of the site. The Erskine Park residential area is located about 3.5km to the west with Minchinbury located about 3km to the north.
Education facilities Horsley Park Public School and Marion Catholic Primary School are located more than 2km south of the site. A childcare centre is within the Eastern Creek industrial area about 1km to the west of the site. A driving school associated with the Sydney Dragway is 1km to the northeast of the site.
Community facilities or services The nearest community halls and churches are located more than 1km to the south of the proposal site within the Horsley Park rural residential area.
Industrial and commercial activities A variety of industrial and commercial businesses operate from the Eastern Creek Industrial area to the west of the M7 Motorway with other industrial operations located to the south of the site (Austral Bricks). Other industrial activities considered essential services are described below.
Infrastructure and essential services The site is bounded by the M7 Motorway and Wallgrove Road to the west and an unnamed road (referred to as Austral Bricks Road) to the south. The Warragamba Pipeline Corridor adjoins the proposal site's southern boundary. The now-closed Eastern Creek landfill site (which still has an operational organics recycling facility component) is located to the north and north-east, with the operational Global Renewables waste management facility located immediately to the east.
Recreational facilities and open space The site is located within the Western Sydney Parklands (WSP). The M7 cycleway is located adjacent to the proposal site's western boundary. This cycleway forms part of the Parklands Track – which connects other trails and tracks of the WSP. The Sydney Motorsport Park and Sydney Dragway are located about 1.5km to the northeast of the proposal site.



Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community © Department of Customer Service 2020 DFSI 2020

Figure 7.1: Sensitive receivers

7.3 Scoping process

The Scoping Report included an environmental risk assessment of the likely environmental impacts of the proposal and the proposed approach to assessment in the EIS based on the available information regarding the site and the proposal at that time. This involved the following steps:

- Describe the existing environment relevant to each issue. For example, for traffic and transport, describe the local transport network and its current performance.
- Identify the aspects of the proposal that may interact with the existing environment to find out potential impacts. For example, generation of additional traffic during operation of the proposal.
- Carry out a preliminary assessment of the impact to consider whether the impact is likely to happen and whether the consequences of the impact would be material. The concepts of likelihood and consequence are commonly used in risk assessments and were used in a simple form for the purpose of the environmental risk assessment.
- Assess the likelihood of impact (negative or positive) that would result, considering mitigation measures. This recognises that for many issues, mitigation is an integral part of the proposal description. For example, the air pollution controls which clean the air before its discharge are a key part of the proposal.
- Consider community perceptions of potential impacts based on the findings of the community engagement carried out before lodgement of the Scoping Report and community responses to similar projects.

  Use the above information to categorise the issue as either ‘key’ or ‘other’. Key issues are those where there is a likelihood of a material impact or where there is a high level of community concern about the issue. ‘Key’ issues must be assessed in detail in the EIS to better understand the impact or to develop proposal-specific mitigation measures. ‘Other’ issues are those where a material impact is not likely. A less detailed assessment may be needed, either because the impact is well understood or there are standard mitigation measures available to manage the impact.
- Note that most issues can be broken down into components. For example, construction dust and operational air emissions are part of Air Quality and Odour for the purposes of the environmental risk assessment. Where one component of the issue is categorised as a key issue and another component is categorised as ‘other’ issue, the overall issue – air quality and odour – is considered to be a ‘key’ issue.

- Identify issues that were considered during the Scoping Report but are not subject to any further assessment in the EIS as they are unlikely to have an impact on the receiving environment.
- Note that the concept of material impact or effect is similar to the concept of significance which is used throughout impact assessment practice. However, significance has a specific meaning within the *Environmental Planning and Assessment Act 1979,* therefore material is used to avoid any confusion. Material effect means that the impact will have an effect that is likely to require mitigation and/or technical assessment[1].

The use of the above assessment method follows the approach described in the Department of Planning Draft EIA Guidelines for State Significant Projects (Guidelines 3 and 4), exhibited in June 2017. The Draft Guidelines describes a process to decide which elements of the receiving environment (matters) are potentially impacted by a proposed development and the level of assessment needed to predict and understand the impact and mitigation measures.

The Draft Guidelines also consider cumulative impacts, where the elements of the receiving environment are affected from the combination of a proposal's impacts and the impacts of other committed and approved projects.

The Scoping Report was issued to the Department on 13 November 2019 after which it was submitted to Government agencies and key stakeholders. The report was discussed at the planning focus meeting (PFM) which helped define the final SEARs.

Table 7.2 summarises the key and other issues identified in the scoping report with an updated assessment of environmental risks based on current design and environmental impact assessment information in the EIS.

The updated environmental risk assessment has not changed the categorisation of assessment issues as key or other issues. However, it has clarified areas of uncertainty identified in the Scoping Report environmental risk assessment, so that the likelihood of impact and consequence can be further defined.

[1] DPIE, 2017

Table 7.2: Environmental assessment scope

<table>
<tr><th>Issue and categorisation</th><th>Likelihood of impact following mitigation: likely or unlikely
Consequences of impact: material or not material</th></tr>
<tr><td colspan="2">Waste management</td></tr>
<tr><td rowspan="3">Key issue</td><td>Waste Supply – Resource Recovery Criteria
Scoping Report:
• Likelihood: it is unlikely that waste received at the EfW facility will be non-compliant with the resource recovery criteria of the EfW Policy as waste supply arrangements would make sure waste is residual from resource recovery operations.
• Consequence: receival of non-compliant waste would be material as it would result in the use of a resource which has a higher order value in the waste hierarchy and non-compliance with the EfW Policy.
EIS: No change.</td></tr>
<tr><td>Waste Supply – Hazardous Waste
Scoping Report:
• Likelihood: it is unlikely that hazardous waste will enter the combustion process as the waste receival, and handling process requires in-bound vehicles to show documents on the source and type of waste. Loads can be inspected in the receival hall and arrangements made for unapproved waste to be transported off site.
• Consequence: combustion of hazardous waste in the EfW process would be material as it would generate additional contaminants in the flue gas. Ensuring hazardous waste does not enter the combustion process is an important issue for the community.
EIS: No change. The flue gas treatment system has been designed to incorporate a wet scrubber and other measures to achieve current international best practice techniques (BAT). The flue gas treatment process is designed to manage instances where small quantities of non-compliant waste enter the process. It is unlikely that hazardous waste will enter the combustion process, however, if they did, the consequence would not be material.</td></tr>
<tr><td>Residual waste management
Scoping Report:
• Likelihood: it is unlikely that residual waste from the EfW process (bottom ash, boiler ash and air pollution control residues) will be disposed at facilities that are not approved and licensed to receive this type of waste.
• Consequence: inappropriate management and disposal of residual waste would be material because of the potential impacts on land and water. Residual waste management is an important issue for the community.</td></tr>
</table>

<table>
<tr><th>Issue and categorisation</th><th>Likelihood of impact following mitigation: likely or unlikely
Consequences of impact: material or not material</th></tr>
<tr><td></td><td>EIS: No change. Incinerator Bottom Ash (IBA) is produced as a waste by-product from the EfW combustion process. The WSERRC will include a ferrous metal separator onsite to recover large ferrous metals from the IBA for recycling and sale to market. The remaining IBA may be transported to a dedicated IBA storage, treatment, metal recovery and maturation facility where non-ferrous metals (or secondary metals) recovery may be carried out.
The IBA facility, if progressed, will be subject to a separate development application process, however, the site location for storage and/or treatment has not been finalised at this stage.
Other ash by-products including Flue Gas Treatment residue (FGTr) and boiler fly ash will be managed offsite using existing infrastructure (described in Chapter 3 Proposal description and will not need any additional related development).</td></tr>
<tr><td colspan="2">Air quality and odour</td></tr>
<tr><td rowspan="2">Key issue</td><td>Air quality
Scoping Report:
Likelihood: it is unlikely that emissions from the stack will exceed air quality standards because of the air pollution controls incorporated into the EfW process and facility design. These controls are based on similar plants operating in the EU which demonstrate that actual emissions are consistently within best international practice standards.
Consequence: exceedance of air quality standards as a result of emissions from the stack would be material because of the potential impacts on air quality and human health. Air quality is an important issue for the community.
EIS: No change. An air quality assessment has been carried out and demonstrates that all emissions will meet required air quality standards as defined in the European Union BAT Conclusions 2019 and NSW Protection of the Environment Operations (POEO) Act 1997.</td></tr>
<tr><td>Odour
Scoping Report:
Likelihood: emissions of odour from the receival hall are unlikely as the building operates under negative pressure with fast acting roller shutter doors containing odour within the building. Air is drawn though the combustion chamber destroying odour in the air.
Consequence: odour emissions would be not material because of the distance to residential areas. Odour is an important issue for the community.
EIS: No change. Design development since the Scoping Report has also identified additional mitigation measures to manage odour including the use of a carbon filter in the waste receival hall to manage odour when the boiler is not operating.</td></tr>
</table>

Issue and categorisation	Likelihood of impact following mitigation: likely or unlikely Consequences of impact: material or not material
Other issue	Air quality – construction Scoping Report: • Likelihood: generation of dust offsite during construction is **unlikely** with the application of standard construction environmental management measures. • Consequence: offsite dust generation would be **not material** given the separation distance to residential areas and the industrial character of surrounding land use. EIS: No change. To minimise dust generation and the potential for offsite impacts during the construction activities, appropriate mitigation measures would be applied.
Human health	
Key issue	Human health – air quality Scoping Report: • Likelihood: exposure of people to unacceptable levels of air emissions from the stack is **unlikely** because of the air pollution controls incorporated into the EfW process. • Consequence: exposure of people to unacceptable levels of air emissions from the stack would be **material** because of the impact on human health. Air quality related human health risk is an important issue for the community. EIS: No change. The design of the flue gas treatment system has been developed since the Scoping Report and includes: • SNCR technology for the reduction of Oxides of Nitrogen (NOx) within the flue gases • Bag house filter • Wet scrubber acts as a final stage to further absorb acid gases, reduce ammonia and reduce volumes of particles and heavy metals. A wet scrubber has been chosen due to the significantly improved emissions performance when compared to a fully dry or semi-dry system. The proposed flue gas treatment system represents best practice and best available technology. WSERRC is the only proposed energy from waste facility in NSW, for which an EIS has been lodged, that commits to this combination of dry/wet flue gas treatment technology.

Issue and categorisation	Likelihood of impact following mitigation: likely or unlikely Consequences of impact: material or not material
	Human health – soil contamination Scoping Report: • Likelihood: exposure of workers to contaminants in soil disturbed and mobilised during construction is **unlikely** because of the construction environmental management and material management procedures that will be used during construction. • Consequence: exposure of workers to contaminants in soil is **material** because of the potential impacts on the health of workers. EIS: No change. Further site investigations have confirmed the presence of contamination in discrete areas of the site. A Remediation Action Plan (RAP) has been prepared which describes the approach to managing contamination onsite to reduce the risk of health and environmental impacts.
	Human health – potable water quality Scoping Report: • Likelihood: exposure of people to unacceptable levels of pollutants being deposited on potable water sources (such as Prospect Reservoir) from air emissions from the stack is **unlikely** because of the air pollution controls incorporated into the EfW process. • Consequence: exposure of people to unacceptable levels of pollutants in potable water sources would be **material** because of the impact on human health. Water quality related human health risk is an important issue for the community. EIS: No change. The air quality assessment has modelled the deposition of particulates on to Prospect Reservoir and concluded that the levels are very small and beyond the level of detection. The health risk assessment has concluded that there will be no unacceptable risks for rainwater tanks or Prospect Reservoir.
Other issue	Human health – disposal of contaminated soil Scoping Report: • Likelihood: exposure of the community from mobilisation of soil contaminants to offsite locations is **unlikely** because of the management procedures that will be used during construction. • Consequence: community exposure to mobilised contaminants is **material** because of the potential health impacts to the community. EIS: No change. All contaminated material will follow a Remediation Action Plan (RAP) ensuring there is no community exposure of contaminated soil.

Issue and categorisation	Likelihood of impact following mitigation: likely or unlikely Consequences of impact: material or not material
Noise and vibration	
Key issue	Noise – EfW operations Scoping Report: • Likelihood: increased noise in the area around the proposal is **likely** as a result of operation of the EfW facility. • Consequence: increased noise is **material** because of the potential impact on recreational users in the Parklands. However, the facility is located around 1km from the nearest residential area. EIS: No change. The noise assessment confirms that the proposal can be designed so that all noise criteria can be meet, therefore avoiding any unacceptable noise impacts during operation of the proposal.
	Noise – construction Scoping Report: • Likelihood: noise from construction activities is **likely**. • Consequence: noise impacts are **material** because of the potential impact on recreational users in the Parklands and occupants of neighbouring industrial facilities during the construction period. EIS: No change: A Construction Noise and Vibration Management Plan (CNVMP) will be prepared and carried out to manage and mitigate any noise and vibration impacts during construction.
Other issue	Noise – transport Scoping Report: • Likelihood: increased noise along transport routes as result of truck movements generated by the proposal is **likely**. • Consequence: while truck routes are not yet known, increased noise from truck movements is **not material** as the overall contribution to traffic on the road network is minor and will be primarily located in industrial areas. EIS: No change. The noise assessment concludes that the noise from additional vehicles on the road network as a result of the proposal would be negligible.

Issue and categorisation	Likelihood of impact following mitigation: likely or unlikely Consequences of impact: material or not material
Water – surface, groundwater and hydrology	
Key issue	Surface water – runoff Scoping Report: • Likelihood: increased surface water run-off as a result of a permanent increase in the impervious area of the site is **likely,** however, surface water management infrastructure will be incorporated into the site layout and design to minimise the risk. • Consequence: increased surface water run-off is **material** because of the potential impacts on Council surface water infrastructure, the Warragamba Pipeline Corridor and neighbouring properties. EIS: No change. Stormwater from hardstand areas and roofs will drain to two basins to control the flow of surface water through the site and manage its discharge offsite.
	Groundwater – flow Scoping Report: • Likelihood: depth to groundwater is unknown, however, the proposal involves below ground structures – waste receival bunker and bottom ash storage bunker (subject to design development). Impact on groundwater is assumed to be **likely**. • Consequence: potential groundwater retardation and change in flow due to the construction of below ground structures is **material** because of impacts on groundwater movement and character. EIS: No change. The bunker will be excavated to a depth of about 15m. The waste bunker excavations will only encounter shallow groundwater and the impacts will be localised and negligible.
	Groundwater – contaminants Scoping Report: • Likelihood: construction of below ground structures will **likely** impact groundwater and may mobilise or expose contaminants in the groundwater. • Consequence: potential mobilisation of contaminants in groundwater is **material** because of the risk of worker and community exposure to contaminants. EIS: No change. The low permeability of the underlying geology limits the potential for mobilisation of pollution, as a precaution, periodic monitoring of groundwater quality will occur throughout the dewatering period.

Issue and categorisation	Likelihood of impact following mitigation: likely or unlikely Consequences of impact: material or not material
Other issue	Water quality – construction Scoping Report: • Likelihood: erosion and sedimentation dispersion during construction is **unlikely** when standard construction environmental management measures are used. • Consequence: erosion and sedimentation dispersion during construction causing impacts on water quality is **not material** because of the distance to watercourses and the ability to manage erosion and sedimentation onsite with standard construction environmental management measures. EIS: No change.
Traffic and transport	
Key issue	Traffic – network performance (operation) Scoping Report: • Likelihood: the proposal is **likely** to generate an increase in car and truck movements on the road during operations. • Consequence: the impact of the increase in traffic on network performance is **not material** because traffic generated would be minor in the context of overall traffic volumes. EIS: No change. The proposal will increase traffic generation, however the impacts on the nearest intersections (Wallgrove Road / Austral Bricks Road and Austral Bricks Road / the site access) will not change the existing level of service at these intersections.
	Traffic – access Scoping Report: • Likelihood: the proposal is **likely** to generate an increase in car and truck movements and a change in vehicle types using the access to the site. • Consequence: the increase in car and truck movements and change in vehicle types is **material** as it will affect the ability of the existing access to accommodate site traffic, potentially requiring upgrade to the access. EIS: No change. The existing access will be upgraded to accommodate heavy goods vehicles required for the proposal. The upgrade will involve minor widening of the existing access road to minimise any new impacts on the Warragamba Pipeline. The access upgrade will be assessed and determined through a separate planning approval process and does not form part of the scope of the WSERRC proposal for the purposes of this EIS. Refer to **Chapter 22 Related Development** for further information.

Issue and categorisation	Likelihood of impact following mitigation: likely or unlikely Consequences of impact: material or not material
	Traffic – access upgrade/interface with Warragamba Pipeline Scoping Report: • Likelihood: any necessary upgrade to the access road will require construction works over the Warragamba Pipeline Corridor, owned by Water NSW. The minor nature of the works is **unlikely** to cause any damage to this infrastructure and associated ecology when standard construction environmental management measures are used. • Consequence: the potential impact of necessary upgrades on the Corridor is **material** as the Corridor contains critical water supply infrastructure. EIS: No change. The access upgrade will be assessed and determined through a separate planning approval process and does not form part of the scope of the WSERRC proposal for the purposes of this EIS. Refer to **Chapter 22 Related development** for further information on site access and **Chapter 6 Engagement** for consultation with WaterNSW. A Warragamba Pipeline Risk Assessment was prepared for this EIS and is included as Appendix A of **Technical report P Utilities and Services Assessment Report**.
Other issue	Traffic – network performance (construction) Scoping Report: • Likelihood: construction of the proposal is **likely** to generate a temporary increase in truck and vehicle movements on the local road network. • Consequence: the impact of construction traffic on the local road network is **not material** as the additional vehicle movements would be negligible compared to existing volumes. EIS: No change.
Hazard and risk	
Key issue	Hazard and risk – incidents related to dangerous goods Scoping Report: • Likelihood: the storage of dangerous goods onsite is **unlikely** to result in incidents which may pose a risk to employees and offsite properties as materials will be handled and stored in line with the relevant requirements of the Dangerous Goods Code. • Consequence: incidents resulting from the inappropriate handling and storage of dangerous goods are **material** because of the potential exposure of employees and offsite properties to hazards. EIS: No change.

Issue and categorisation	Likelihood of impact following mitigation: likely or unlikely Consequences of impact: material or not material
Other issue	Hazard and risk – construction incidents related to dangerous goods Scoping Report: • Likelihood: worker incidents, spills and leaks and exposure to contaminated soil during construction are **unlikely** as the construction contractor will apply site safety and material handling procedures. • Consequence: impacts from worker incidents, spills and leaks and exposure to contaminated soil during construction are **materia**l because of the potential exposure of workers and offsite properties to hazards. EIS: No change.
Flora and fauna	
Key issue	Flora and fauna – terrestrial Scoping Report: • Likelihood: the clearing of vegetation during construction is **likely**, however, vegetation communities with habitat value are located on the eastern portion of the site and will be avoided to the extent possible through the design and layout of the site. • Consequence: the impact of vegetation clearing is **material** because of the presence of vegetation communities with habitat value on part of the site. EIS: No change. Clearing of 0.45ha of Cumberland Woodland is required. A Vegetation Management Plan (Appendix G of **Technical report Q Biodiversity Development Assessment Report**) has been prepared and will be carried out to rehabilitate the site following construction.
	Flora and fauna – aquatic Scoping Report: • Likelihood: increased surface water run-off to the pond in the eastern part of the site will **likely** affect any aquatic ecology due to dirty surface water run-off into the pond however, this risk will be managed through construction environmental management measures and permanent surface water management measures used onsite. • Consequence: the impact of run-off on aquatic ecology is unknown and is assumed to be **material.** EIS: No change. The farm dam will be decommissioned as part of the proposal, with a dewatering management plan (as part of the Construction Management Plan) carried out to manage any environmental risks. The realigned overland flow path will improve aquatic habitats with new planting proposed.

Issue and categorisation	Likelihood of impact following mitigation: likely or unlikely Consequences of impact: material or not material
Other issue	Fauna – artificial light Scoping Report: • Likelihood: the proposal will introduce artificial light sources to the site which is **likely** to impact fauna and fauna habitat. • Consequence: the impact on fauna and fauna habitat from the introduction of an artificial light source is **not material** as the site is located between existing light sources such as the M7 motorway and the Global Renewables facility. EIS: No change. The proposal will include a recessive lighting design which seeks to light buildings from within, rather than lighting facades., minimising light spill to surrounding areas.
Landscape character and visual amenity	
Key issue	Landscape and visual Scoping Report: • Likelihood: the proposal will introduce a new built form at a different mass and scale to the surrounding built environment which will **likely** affect visual amenity, however architectural design of the facility will make sure this impact is minimised. • Consequence: the impact of the new built form on visual amenity would be **material** due to the scale of the stack and mass and scale of the main building compared to existing industrial built form in the surrounding area. EIS: No change. The proposal has been designed to mitigate bulk by integrating the stack and blade walls, incorporating green walls and using low-reflective materials.
Greenhouse gas emissions	
Key issue	GHG emissions Scoping Report: • Likelihood: the proposal is **likely** to result in a net reduction in GHG emissions due to avoidance of emissions from landfill gas and generation of renewable energy. • Consequence: the impact of the GHG emissions reduction is **material** as it will contribute to NSW and National policy objectives regarding climate change and renewable energy generation. EIS: No change. The proposal would result in a net reduction in GHG emissions of around 390,000 tonnes CO_2-e.

Issue and categorisation	Likelihood of impact following mitigation: likely or unlikely Consequences of impact: material or not material
Airspace operations	
Key issue	Airspace – intrusion Scoping Report: • Likelihood: the proposal is unlikely to intrude into the protected airspace of the new Western Sydney Airport (OLS and PAN-OPS) because of its distance from the Airport and the design of the facility. However, as the PAN-OPS for the Airport has not yet been defined, intrusion into the airspace is assumed to be **likely** for the purposes of the Scoping Report and until such time that the PAN-OPS is defined. • Consequence: the impact of intrusion into protected airspace is **material** as it would present a risk to aviation safety. EIS: No change. Consultation has been conducted with Western Sydney Airport, Airservices Australia and Civil Aviation Safety Authority, which has confirmed that the proposal will not cause a risk to aviation safety.
Contamination, geology and soils	
Key issue	Contamination Scoping Report: • Likelihood: disturbance and mobilisation of soil contaminants during construction is **likely** but risks will be managed through construction environmental management and material handling procedures. • Consequence: impacts of exposure to workers and offsite properties to soil contaminants is **material**. EIS: No change. The contamination assessments have identified asbestos material and lead on site. These will be managed by a Remediation Action Plan to minimise the risk of impacts to human health and environment.
Other issue	Soils Scoping Report: • Likelihood: erosion and sedimentation dispersion during construction is **unlikely** when standard construction environmental management measures are used. • Consequence: erosion and sedimentation dispersion during construction causing impacts on water quality is **not material** because of the distance to watercourses and the ability to manage erosion and sedimentation onsite with standard construction environmental management measures. EIS: No change.

Issue and categorisation	Likelihood of impact following mitigation: likely or unlikely Consequences of impact: material or not material
Services and utilities	
Key issue	Connection to electricity grid Scoping Report: • Likelihood: it is **likely** that the proposal will need a new connection to the electricity grid to allow the export of power from the EfW facility. • Consequence: the capacity of the existing electricity grid infrastructure to accommodate a new connection to the site is unknown, therefore the impact is assumed to be **material**. EIS: No change. Options to connect to the electricity grid have been identified. See **Chapter 22 Related development**.
	Connection to other services Scoping Report: • Likelihood: it is **likely** that the proposal will need new connections to utility services such as water supply, drainage and wastewater. • Consequence: the capacity of the existing services infrastructure to accommodate new connections to the site is unknown, therefore, the impact is assumed to be **material**. EIS: No change. The proposal will need new connections to utility services. However, the impacts will not be material as consultation has been conducted with utility providers to confirm capacity is available. See **Chapter 22 Related development**.
Social	
Key issue	Social Scoping Report: • Likelihood: the proposal is **likely** to have real and perceived impacts on people and communities through a combination of impact pathways described in the above sections. Impacts can be avoided, mitigated and managed. The proposal will carry out a comprehensive community and stakeholder engagement strategy during the preparation of the EIS to respond to community concerns – real and perceived – about the proposal. • Consequence: impacts on people and communities, through a variety of impact pathways, is **material**. EIS: No change. A comprehensive community and stakeholder engagement strategy has been employed in the preparation of the EIS (refer to **Chapter 6 Engagement** and **Appendix F Community and Stakeholder Engagement Report**). A community reference group will be created to represent the community during construction and operation of the proposal and among other responsibilities, will manage the community funding package.

Issue and categorisation	Likelihood of impact following mitigation: likely or unlikely Consequences of impact: material or not material
Heritage	
No further assessment required	Heritage Scoping Report: • The area is low-lying and next to a first order drainage line. It therefore within an area of low Aboriginal heritage sensitivity and potential. The lack of heritage and archaeological value can be further reinforced by the level of previous disturbance associated with extensive modern land use practices. • Desktop studies and a site assessment confirmed a low-level of archaeological sensitivity and potential across the site based on the distribution of registered recorded archaeological sites supported by a credible and detailed heritage investigation record in the area. Consistent with these studies, neither the desktop assessment nor site inspection identified any sites, objects or archaeological potential onsite or locally. The evidence collected is therefore considered enough to discount heritage impacts. • Based on the heritage assessment completed to date, heritage impacts are considered **unlikely**. EIS: The SEARs required an Aboriginal Cultural Heritage Assessment be prepared (**Technical Report O**). The report concludes that heritage impacts are unlikely, but if unexpected heritage was discovered during construction it could have a material impact.
Bushfire	
No further assessment required	Bush fire risk Scoping Report: The site is not mapped as Bush Fire Prone Land (BFPL), so no further assessment of bushfire risk is proposed. EIS: No change.

7.4 Environmental impact assessment: overview

Chapter 8 to Chapter 23 assess the proposal impacts. Each chapter is generally consistent in its presentation including:

- **Introduction:** briefly describing the overall assessment approach and guidelines followed.
- **Existing environment:** setting out the context, values and receivers that may be impacted by the proposal.

  The existing environment is not necessarily limited to the current baseline. It may account for changes in the future through natural events (such as climate change) or future committed development in an area. Importantly, the impact assessment was carried out to assess the worst-case scenario – for example, when the existing environment is most valued/sensitive to change.
- **Assessment***:* describes the predicted impacts likely to occur during construction and operation. Each assessment defines ratings (thresholds) appropriate to the nature of the environmental aspect and in line with accepted terminology where standardised methods are used.

  Impacts may be direct, like the loss of threatened ecological community to the proposal footprint, or indirect, like pollution downstream arising from sedimentation during earthworks.

  They may be short-term/temporary (dust associated with construction), medium-term (vegetation trimming and pruning that is allowed to regenerate after), or long-term/permanent (an improvement in local air quality).

  They may be positive (screening of an existing eyesore) or negative (loss of an attractive landscape component).

  The predictions were based on:

  - Known or likely presence and sensitivity of values and receivers as determined by their designated status along with qualitative criteria such as rarity, status and condition
  - Number and sensitivity of affected receivers
  - Extent, nature and duration of the physical changes from constructing, operating, maintaining and decommissioning the proposal
  - Ability of the value and/or receiver to accommodate the predicted changes introduced under the proposal and how they would respond to mitigation measures.
- **Mitigation measures:** analyses how impacts have been avoided, minimised, offset or managed.

Chapter 8

Air quality and odour

8 Air quality and odour

8.1 Introduction

This chapter summarises the air quality and odour impacts associated with the construction and operation of the proposal. An Air Quality and Odour Impact Assessment (AQOIA) has been prepared and is included as **Technical report A**.

The approach to preparing the AQOIA included:

- A review of climate data for the area surrounding the proposal site to understand how emissions disperse in the atmosphere
- A review of existing or background air quality surrounding the proposal site to understand how the proposal may change existing conditions. For the purposes of the AQOIA, predicted emissions from the Next Generation Energy from Waste facility (development application currently subject to NSW Land and Environment Court proceedings), were added to background air quality to understand the impacts of the proposal when potential future changes to the background are considered. Information on the Next Generation proposal is based on the stack parameters and emissions estimates in the Pacific Environment (2017) air quality assessment and a waste throughput of 552,500tpa.
- Determining receptors within a 3km radius of the proposal site that may be potentially impacted by emissions from the proposal (refer to **Figure 8.1**). This radius was chosen as a preliminary assessment indicated that impacts reduced beyond this area.
- Analysing the relevant air quality impact assessment criteria and emission limit values (ELVs) based on NSW EPA requirements and international standards. Impact assessment criteria refers to air quality criteria at receptor locations whereas ELVs refer to the emission limits in the stack before discharge to the atmosphere.
- The ELVs for the proposal are based on the values in the EU Industrial Emissions Directive 2010 and the Best Available Technology Reference document (BREF) 2019 and the *Protection of the Environment Operations (Clean Air) Regulation 2010.*
- The ELVs were compared to actual in-stack concentration of emissions from the operational Dublin EfW facility, one of two facilities selected as reference facilities for the purposes of the NSW Energy from Waste Policy Statement, based on its similarity to the proposal.

The actual in-stack concentration of emissions for the Dublin facility are below the ELVs specified in BREF 2019 with the exception of NO_x (nitrogen oxide, calculated as NO_2)[1].

- The ELVs for the proposal were inputted to an air quality dispersion model[2] to assess the potential air quality impacts at receptor locations by comparison to the impact assessment criteria.
- The assessment considered a range of scenarios considered to be representative of the possible conditions that may be experienced during operation of the proposal, including a worst-case operating scenario represented by Scenario 3 and a worst-case upset conditions scenario represented by Scenario 4.
- An assessment of potential odour impacts was carried out.
- As assessment of deposition of particulates on Prospect Reservoir was carried out.
- An assessment of construction related air quality impacts was carried out.
- Operational mitigation measures are largely embedded in the design and have been factored into the assessment with no additional mitigation necessary.

The AQOIA has been prepared in line with the NSW Environment Protection Authority (EPA) approved methods document[3] referred to in the *Protection of the Environment Operations (Clean Air) Regulation 2010*.

Assessment of odour impacts has been prepared in general compliance with Technical Notes – Assessment and Management of Odour from Stationary Sources in NSW (DEC 2006).

The proposal has been designed to meet the requirements of the European Industrial Emissions Directive (IED) (Directive 2010/75/EU of the European Parliament) and the associated Best Available Techniques Reference 2019 (BREF) document. The BREF describes techniques to reduce the environmental impacts of EfW facilities and the environmental performance standards that can be achieved by these techniques. The BREF was updated in 2019 with more stringent environmental performance standards reflecting improvements in environmental performance in operational EfW facilities in Europe.

---

[1] The Dublin EfW facility sampled NOx over a 30-minute period and thus the daily average NO_x BREF ELV does not apply to the presented value. However, the half-hour maximum emission limit of 400mg/Nm^3 (normal cubic metre) can be applied, with the maximum NO_x emissions from the Dublin facility close to half the limit.

[2] An air quality dispersion model characterises atmospheric processes that disperse a pollutant emitted from a source, allowing pollutant concentrations at selected downwind receptor locations to be predicted

[3] Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (NSW EPA, 2017)

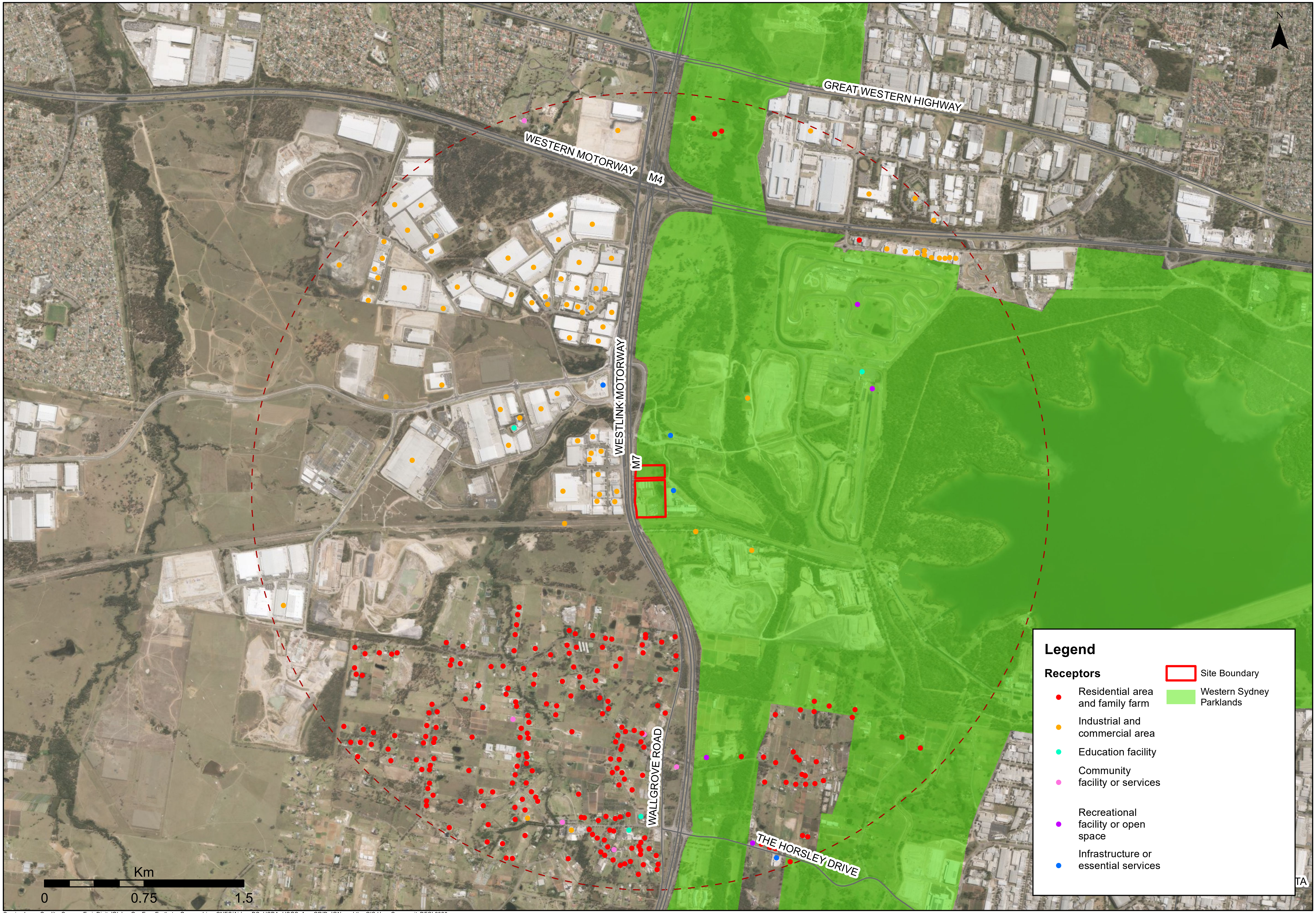
Modern EfW facilities such as the Dublin EfW facility, one of the references facilities selected for this proposal, are designed to meet the new BREF standards, whereas many older facilities need to invest in updated flue gas treatment technology to meet the new standards.

While the BREF standards must be installed in the permits of all European plants by 2023, the in-stack concentrations at the Dublin facility are already below the new standards except for NO_x. The standard for NO_x can be achieved through additional mitigation measures which will be applied when requited by the updated permit.

The EU BREF is widely recognised as representing current international best-practice techniques and it has been relied on to fulfil the purposes set out in the NSW EPA's Energy from Waste Policy Statement.

The EU Commission Implementing Decision (2019/2010) of the 12 November 2019 states the best available techniques (BAT) conclusions as the main element of the BREF and prescribes them to be adopted by Member States of the EU. The BAT conclusions (part of the BREF) include ELVs associated with the application of BAT that aim to apply continuous improvements to emissions from the EfW sector.

Cumulative air quality impacts with other approved projects have been discussed in **Chapter 23 Cumulative impact assessment**. This considered but did not include the Western Sydney Airport located about 15km away. A review of its impact assessment shows that it would not affect the background concentration levels near the proposal. As such the Western Sydney Airport has not been included in the cumulative assessment.



Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User CommunityDFSI 2020

Figure 8.1: Air quality and odour impact assessment receptors

8.2 Existing environment

8.2.1 Climate overview

Based on climate data from the Bureau of Meteorology (BoM) weather station at Horsley Park Equestrian Centre the main features of the local climate relevant to the AQOIA are:

- Wind speeds during the warmer months have a greater spread between 9am and 3pm, compared to the colder months.
- Wind direction varies over the year but is predominantly from the south-west.
- In summer, winds tend to occur from the south-west, east-north-east and south-east.
- Autumn wind distribution is similar to the annual distribution, with winds predominantly occurring from the south-west, and fewer winds from the north-east.
- In winter there are fewer winds originating from the east, with winds occurring predominantly from the south-west and west-south-west.
- During spring the winds are varied from all directions, with winds from the south-west most dominant.

Annual and seasonal wind roses are shown in **Figure 8.2.**

Climate change projects are described in **Chapter 18 Greenhouse gas and energy efficiency**. The AQOIA has considered the impact of climate change projects on the air quality assessment. It noted that although this may have an impact on the ambient air quality, for example more severe storms may occur, it is unlikely to have a material effect on the emissions or the predicted impact from the proposal.

8.2.2 Ambient air quality

The main sources of air emissions in the area surrounding the proposal site include emissions from industrial and commercial sources, motor vehicle exhaust, wood heater emissions and various agricultural activities.

The following section summarises ambient air quality in the area surrounding the proposal site based on data from 2014–2019 from the Liverpool, Bringelly, Prospect and St Marys monitoring stations managed by the Department.

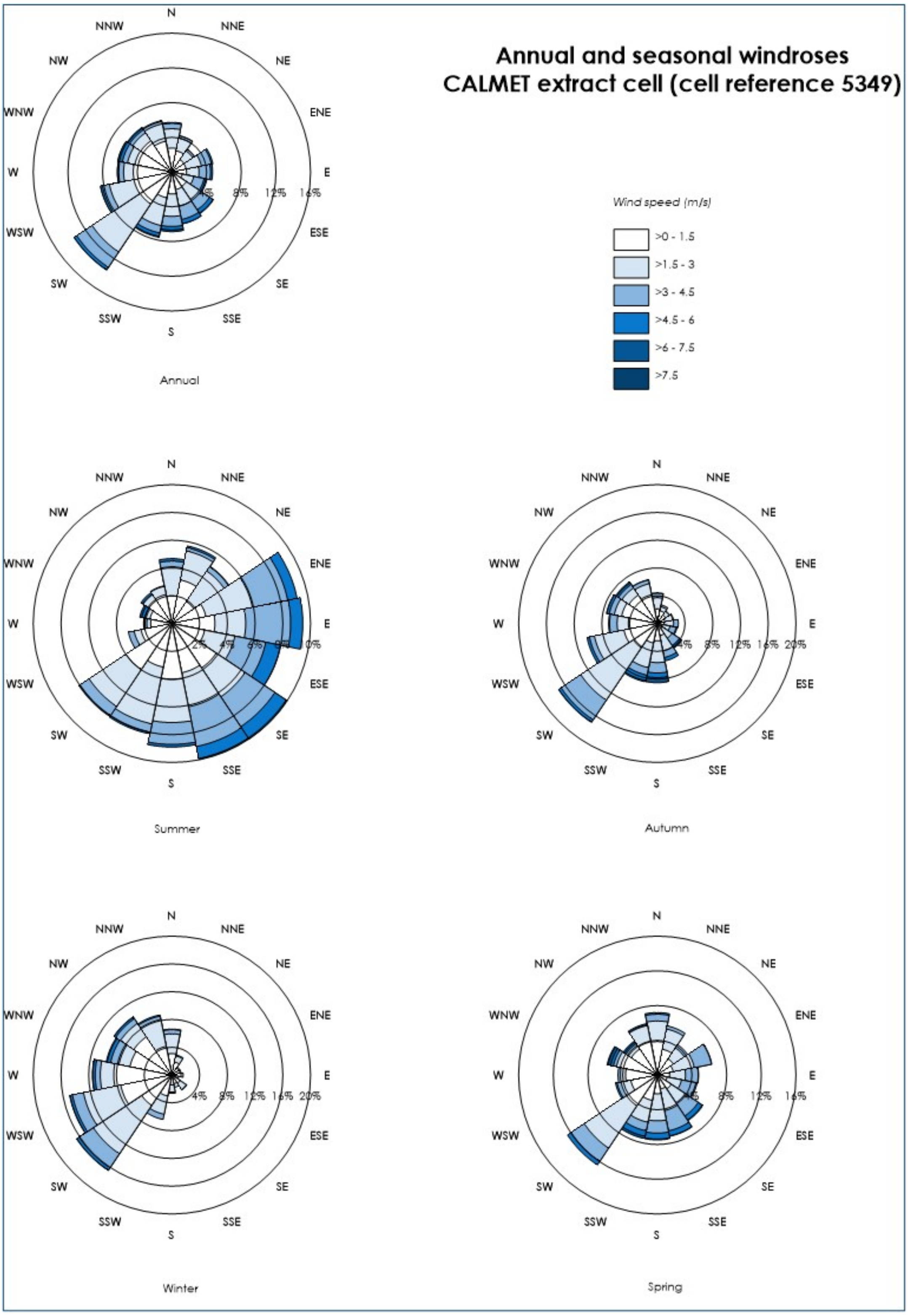


Figure 8.2: Annual and seasonal wind roses from CALMET (Cell Ref 5349)

8.2.2.1 PM_{10}

Table 8.1 summarises background PM_{10} levels based on data from the monitoring stations, presented as annul average and maximum 24-hour average. PM_{10} refers to particulate matter 10 micrometres (a micrometre is one millionth of a metre) or fewer in diameter.

Table 8.1: Summary of PM_{10} levels from NSW DPIE monitoring (µg/m³)

Year	Liverpool	Bringelly	St Mary	Prospect	Criterion
Annual Average					
2014	19	16.6	16.7	17.6	25
2015	18.4	15.8	15	17.6	25
2016	19.5	16.9	16.1	18.9	25
2017	20.6	19.8	16.2	18.9	25
2018	24.2	21.3	-	21.9	25
2019	**27.7**	23.6	24.6	**26**	25
Maximum 24-hour Average					
2014	40.8	42.6	45	44.3	50
2015	**68.6**	**57**	**53**	**68.7**	50
2016	**68.7**	**61.6**	**100.2**	**110.1**	50
2017	**74**	**83.7**	49.8	**61.1**	50
2018	**101.5**	**-**	**-**	**113.3**	50
2019	**178.9**	**134**	**159.8**	**182.8**	50

Note: exceedances of criteria are highlighted as red bold text

The annual average PM_{10} concentrations were below the relevant criterion of 25µg/m³ (micrograms per cubic metre) each year except in 2019, where exceedances were recorded at Liverpool and Prospect monitoring stations. This was due to the regional dust storms and bushfires in that year

Consistent with most other stations in NSW, the maximum 24-hour average PM_{10} concentrations exceeded the relevant criterion of 50µg/m³ on occasion during the review period, typically corresponding with regional dust events and bushfires. At other times, potential dust sources such as local agricultural and industrial activity may have contributed to periods of elevated PM_{10} levels.

8.2.2.2 $PM_{2.5}$

Table 8.2 summarises background $PM_{2.5}$ levels based on data from the monitoring stations, presented as annul average and maximum 24-hour average ($PM_{2.5}$ refers to particulate matter 2.5 micrometres or fewer in diameter).

Table 8.2: Summary of $PM_{2.5}$ levels from NSW DPIE monitoring (µg/m³)

Year	Liverpool	Bringelly	St Mary	Prospect	Criterion
Annual Average					
2014	**8.6**	-	-	-	8
2015	**8.5**	-	-	**8.2**	8
2016	**8.7**	-	-	**8.7**	8
2017	**8.9**	7.5	7	7.7	8
2018	**10.1**	**8**	**7.8**	**8.5**	8
2019	**12.8**	**11.3**	**9.8**	**11.9**	8
Maximum 24-hour Average					
2014	24.3	-	-	-	25
2015	**32.2**	-	-	**29.6**	25
2016	**50.8**	-	**93.2**	**84.9**	25
2017	**56.4**	**52.5**	**38.2**	**30.1**	25
2018	**45.4**	**55.6**	**80.5**	**47.5**	25
2019	**156**	**178**	**88.3**	**134.1**	25

Note: exceedances of criteria are highlighted as red bold text

The annual average $PM_{2.5}$ concentrations were generally above the relevant criterion of 8µg/m³, except for Bringelly, St Mary and Prospect in 2017 which were below the criterion.

The maximum 24-hour average $PM_{2.5}$ concentrations generally exceeded the relevant criterion of 25µg/m³, except for Liverpool in 2014. Exceedances of the maximum 24-hour average criterion typically correspond with regional dust events and bushfires.

8.2.2.3 Other emissions

The main observations for ambient air quality for other emissions are:

- SO_2 (sulfur dioxide):

  Annual, 1-hour and 24-hour average SO2 concentrations at the monitoring stations were below the relevant criterion of 60µg/m³, 570µg/m³ and 228µg/m³ respectively.

- NO_2 (nitrogen dioxide):

  The annual and 1-hour average NO_2 concentrations at the monitoring stations were below the relevant criterion of 62µg/m³ and 246µg/m³, respectively.

- CO (carbon monoxide):

  1-hour average CO concentrations at the monitoring stations were below the relevant criterion of 30,000µg/m³.

Ambient air quality monitoring located near the proposal site was commissioned for around three months from October 2018 to January 2019. The two monitoring stations were located on residential properties surrounded by a mix of residential and agricultural land to the south, south-west and south-east of the site, considered to be representative of the most relevant residential areas for assessing the potential air quality impacts from the proposal.

Data was compared to air quality monitoring data from the St. Marys and Prospect stations and found to be generally consistent, suggesting that these locations are predominantly influenced by regional air quality levels rather than a specific local source.

Monitoring data from the NSW DPIE Prospect site are considered representative of the ambient air quality in the area surrounding the proposal and have been used to represent the background levels for the purposes of air quality modelling for the proposal. The predicted emissions from the Next Generation Energy from Waste Facility have also been added to account for potential future changes to air quality emissions, should this proposal proceed.

8.3 Assessment

8.3.1 Construction

The construction activities associated with the proposal have the potential to generate dust emissions mainly from the excavation and handling of material, vehicle movements, exhaust emissions from diesel-powered equipment and windblown dust generated from exposed areas. The potential impact due to these activities is difficult to accurately quantify on any given day due to the temporary and sporadic nature of these activities and the short-term and variable location of any one activity during the construction phase.

The significant dust generating activities associated with building of the proposal will occur in Phase 1 Demolition and Phase 2 Site Establishment and Enabling Works of the construction phases. The other construction phases of the proposal would occur after these two phases and have a lower propensity to generate dust emissions overall through the nature of the proposed activities.

The potential dust emissions have been assessed using two different methods: a qualitative approach and a quantitative approach using dispersion modelling.

The qualitative assessment is based on the Institute of Air Quality Management (IAQM) Guidance on the assessment of dust from demolition and construction. This document determines the activities that pose the greatest risk of air quality impacts during the construction phase, which can be used to recognise the main activities and to focus controls to manage the risk appropriately, and where necessary reduce the impact through proactive management.

The qualitative assessment confirms a potential high risk based on the scale of dust emissions, but finds an overall low risk based on the distance to sensitive receptors.

The impact of potential construction dust emissions was tested further through a quantitative dispersion modelling approach. Meteorological conditions associated with dust generation (such as wind speed) and levels of dust generating activity were considered in calculating the hourly varying emission rate for each source.

The results show minimal incremental effects would arise at the nearest receptor locations due to the construction activity. The low incremental predictions at the receptors, when considered with the potential background air quality levels shown, indicate that any potentially significant cumulative dust impacts associated with the construction activity are unlikely to occur at any receptor locations.

To make sure that activities associated with the construction phase have a minimal effect on the surrounding environment, a Dust Management Plan will be developed. The Dust Management Plan would form part of the overall Construction Environmental Management Plan which is described in **Chapter 24 Summary of management and mitigation measures**.

8.3.2 Operation

8.3.2.1 Air quality model

Modelling was carried out using a combination of the CALPUFF Modelling System and The Air Pollution Model (TAPM). The models used available meteorological data for January 2015 to December 2015 from nearby meteorological monitoring stations. The 2015 calendar year was selected as the meteorological year for the dispersion modelling based on analysis of long-term data trends in meteorological data recorded for the area.

The air quality model assumes a stack height of 75m (+/- 5 m).

8.3.2.2 Air quality criteria

Air quality criteria are benchmarks set to protect the general health and amenity of the community regarding air quality. They include impact assessment criteria for air quality at receptor locations and in-stack pollutant concentration limits (or emission limit values) for emissions in the stack before discharge to the atmosphere.

The criteria are derived from the NSW EPA's Approved methods for the modelling and assessment of air pollutants in New South Wales, the NSW EfW Policy Statement and the BREF.

The 2019 BREF includes emission limits as a range (referred to as BAT-Associated Emissions Limits (AELs), where various emission limits may be achieved depending on the associated waste streams in the proposal and the included pollution control technologies. For conservatism, this assessment has focused on making sure the proposal can achieve impact assessment criteria if operating at the upper range of the BAT-AELs.

The proposal will be required to operate within emission limit values determined in the EPL (see section on proposed licence limits below). These values set the limits on concentrations of pollutants in the stack before discharge. They have been used in the air quality assessment to model impacts at receptors, confirming they are within criteria. The EfW process is designed to operate within these emission limit values, considering variations in the composition of waste feedstock.

To demonstrate compliance with the NSW EfW policy, the proposal has considered two reference facilities, one in Dublin, Ireland and the other in Filborna, Sweden, both of which are described in **Chapter 5 EfW policy**. The facilities were chosen because of their similarities in waste feedstock, combustion process and flue gas treatment technology.

However, the total annual capacity of the Dublin facility is more consistent with the proposal and has a significant volume of stack monitoring data available, so Dublin has been used as the basis for emissions comparison.

The assessment is based on the waste feedstock described in **Chapter 3 Proposal description**. Note that any hazardous waste is explicitly excluded from the incoming waste stream. The proposal has developed protocols to manage and mitigate any potential unacceptable waste, such as inspection regimes and scanning for radioactive material. It is evident from the Dublin reference facility that incoming waste is appropriately managed and demonstrated to operate within their approved emission limits.

8.3.2.3 Assessment scenarios

The facility has been designed to operate in several modes. Normal operation is defined by operation of the facility within the limits of the firing diagram shown in **Chapter 3 Proposal description**. This shows a range of different Load Points (LPs) that vary according to the input tonnes per hour (tph) of waste, varying calorific value (or energy content) in Megajoules per kilogram (MJ/kg) of the waste and a varying thermal load in Megawatts (MW) for the boiler.

The proposed plant is designed to operate close to the design point (LP1) at 31.3tph at a calorific value of 11.0GJ/t, which is equivalent to 344.3 GJ/hr or 95.5MW).

In addition to normal operations, the facility will operate in start-up and shutdown modes, abnormal operations (for example, component failure) and steam turbine outage as described in **Chapter 3 Proposal description**.

The proposal has been designed so that in all cases that the facility can be brought to a safe, controlled stop that adheres to environmental requirements.

For the purposes of the air quality assessment, the following scenarios have been defined that are representative of these operating modes:

- **Scenario 1**– Represents the maximum annual average regulatory limit emissions to be released from the stack (comprising two flues) at nominal load point operating conditions. This scenario evaluates annual average impacts.
- **Scenario 2** – Represents the maximum 24-hour average regulatory limit emissions to be released from the stack (comprising two flues) at nominal load point operating conditions, and at the most impacting load point operational condition at any location, in any hour of the year. The scenario evaluates the expected maximum 24-hour average impacts and is consistent with the upper range of the BAT-AELs emissions limits.
- **Scenario 3** – Represents the maximum 1-hour average regulatory limit emissions to be released from the stack (comprising two flues) at nominal load point operating conditions, and at the most impacting load point condition at any location, in any hour of the year. The scenario models the maximum 1-hour emissions under the worst-case operating load and air dispersion conditions to quantify the maximum short term 1-hour and 24-hr average impacts.
- **Scenario 4** – The scenario evaluates worst-case upset conditions and the upper range of potential impacts at the proposed licence limits, at the most impacting load point condition at any location, in any hour of the year. The scenario conservatively assumes maximum hourly emissions are generated for 24 hours.

An additional scenario – the EPA limit scenario – representing a hypothetical worst-case scenario was assessed. This scenario conservatively assumes maximum regulatory limit hourly emissions at all hours of the year at normal load point operating conditions. It is noted that this scenario cannot actually occur, and it has been modelled to conservatively estimate hypothetical maximum impacts for a regulatory limit scenario.

In addition to modelling emissions at the flow conditions for each LP, the modelling applies conservative estimates for the plant emissions, consistent with the maximum potential levels that might be emitted, thus accounting for any potential variability in the feed waste material affecting the post treatment emissions that may be released. This is evident from the Dublin reference facility where the measured emissions are much lower than the levels modelled in every assessed scenario for the proposal, as described in the Air Quality and Odour Impact Assessment (AQOIA) presented as **Technical report A**.

Please note, that due to normal variability in the composition of the waste fuel, the system tends to keep the thermal load as constant as possible by varying the material throughput. The mixing of waste in the waste bunker to make it homogeneous will result in maintaining operations as close as possible to the selected thermal load of the facility hence any large short-term fluctuations are avoided as much as possible.

8.3.2.4 Emissions assessment

In line with EPA requirements, impacts are presented as either incremental (the proposal considered in isolation from other emission sources) or total cumulative (the proposal considered with other emission sources in the existing environment), depending on the emission being assessed. Note that only a few of the pollutants have incremental impact assessment criteria.

The assessment of incremental impacts is shown in **Table 8.3.**

Table 8.3: Incremental dispersion modelling results, maximum predicted concentrations

Pollutant	Averaging period	Predicted concentrations					Criteria
		SC1	SC2 - LP1(Max LP)	SC3 - LP1(Max LP)	SC4	EPA Limit Scenario	
$PM_{2.5}$ (1)	24-hour	-	0.59(0.64)	-(-)	3.83	3.56	-
	Annual	0.02	-(-)	-(-)	-	0.30	-
PM_{10} (1)	24-hour	-	0.61(0.66)	-(-)	3.95	3.68	-
	Annual	0.02	-(-)	-(-)	-	0.30	-
TSP(1)	Annual	0.02	-(-)	-(-)	-	0.30	-
Deposition(1)	Annual*	0.001	-(-)	-(-)	-	0.02	**2**
HF(1)	24-hour	-	0.13(0.13)	-(-)	0.54	0.50	-
	7 days	-	0.08(0.09)	-(-)	0.36	0.34	-
	30 days	-	0.06(0.07)	-(-)	0.27	0.25	-
	90 days	-	0.05(0.05)	-(-)	0.22	0.20	-
SO_2 (1)	10-min	-	-(-)	296(315)	315	296	-
	1-hour	-	-(-)	224(239)	239	224	-
	24-hour	-	3.75(4.03)	-(-)	26.9	25.0	-
	Annual	0.04	-(-)	-(-)	-	1.60	-
NO_2 (1)	1-hour	-	-(-)	130(174)	174	130	-
	Annual	0.33	-(-)	-(-)	-	1.47	-
TOC(2)	1-hour	-	-(-)	9.66(10.5)	10.5	9.66	**29**
HCl(2)	1-hour	-	-(-)	29.0(31.4)	31.4	29.0	**140**
NH_3 (2)	1-hour	-	-(-)	14.5(15.7)	15.7	14.5	**330**
Hg(2)	1-hour	-	-(-)	0.017(0.018)	0.0183	0.02	**1.8**
Cd+Tl	1-hour	-	-(-)	0.010(0.011)	0.0105	0.01	**0.018**
Metals(2),(3)	1-hour	-	-(-)	0.145(0.157)	0.157	0.15	-
Dioxins (2)	1-hour	-	-(-)	2.90x10^-8(3.14x10^-8)	3.14x10^-8	2.90x10^-8	**2.00x10^-6**

Pollutant	Averaging period	Predicted concentrations					Criteria
		SC1	SC2 - LP1(Max LP)	SC3 - LP1(Max LP)	SC4	EPA Limit Scenario	
$Cd^{(2)}$	1-hour	-	-(-)	0.005(0.006)	0.006	0.005	**0.018**
$Tl^{(2)}$	1-hour	-	-(-)	0.005(0.005)	0.005	0.005	**-**
$As^{(2)}$	1-hour	-	-(-)	0.004(0.004)	0.004	0.004	**0.09**
$Co^{(2)}$	1-hour	-	-(-)	0.003(0.003)	0.003	0.003	**-**
$Cr^{(2)}$	1-hour	-	-(-)	0.030(0.033)	0.033	0.030	**0.09**
$Cu^{(2)}$	1-hour	-	-(-)	0.032(0.034)	0.034	0.032	**18**
$Mn^{(2)}$	1-hour	-	-(-)	0.009(0.01)	0.010	0.009	**18**
$Ni^{(2)}$	1-hour	-	-(-)	0.052(0.057)	0.057	0.052	**0.18**
$Pb^{(1)}$	Annual	-	-(-)	0.0001(0.0001)	0.0001	0.0001	**0.5**
$Sb^{(2)}$	1-hour	-	-(-)	0.003(0.003)	0.003	0.003	**9**
$V^{(2)}$	1-hour	-	-(-)	0.002(0.002)	0.002	0.002	**-**
$Be^{(2)}$	1-hour	-	-(-)	0.0004(0.0004)	0.0004	0.0004	**0.004**
$Se^{(2)}$	1-hour	-	-(-)	0.011(0.012)	0.012	0.011	**-**
$Sn^{(2)}$	1-hour	-	-(-)	0.01(0.011)	0.011	0.010	**-**

(1) Assessed at receptors
(2) Assessed at and beyond the boundary of the facility
(3) Metals include the sum of Sb + As + Pb + Cr + Co + Cu + Mn + Ni + V
* g/m²/month
SC1 / SC2 / SC3 / SC4 = Scenario 1 / Scenario 2 / Scenario 3 / Scenario 4
MAX LP = the most impacting load point
Note: exceedances of criteria are highlighted as red bold text

Predicted incremental impacts are low, with the maximum predicted air quality levels below the relevant criteria for all assessed air pollutants.

The assessment of cumulative impacts, without the addition of the predicted emissions from the Next Generation, is shown in **Table 8.4.** Note that this displays results for pollutants for which a cumulative impact criterion applies.

Table 8.4: Cumulative dispersion modelling results, maximum predicted concentrations – with background levels (without the addition of predicted emissions from the Next Generation)

Pollutant	Averaging period	Predicted concentrations					Criteria
		SC1	SC2 - LP1(Max LP)	SC3 - LP1(Max LP)	SC4	EPA Limit Scenario	
$PM_{2.5}$ (1)	24-hour	-	**30.2(30.2)**	-(-)	**33.4**	33.2	**25**
	Annual	**8.22**	-(-)	-(-)	-	**8.50**	**8**
PM_{10} (1)	24-hour	-	**69.3(69.4)**	-(-)	**72.7**	**72.4**	**50**
	Annual	17.6	-(-)	-(-)	-	17.9	**25**
TSP(1)	Annual	63.4	-(-)	-(-)	-	63.7	**90**
Deposition(1)	Annual*	2.80	-(-)	-(-)	-	2.81	**4**
HF(1)	24-hour	-	0.13(0.13)	-(-)	0.54	0.50	**2.9**
	7 days	-	0.08(0.09)	-(-)	0.36	0.34	**1.7**
	30 days	-	0.06(0.07)	-(-)	0.27	0.25	**0.84**
	90 days	-	0.05(0.05)	-(-)	0.22	0.20	**0.5**
SO_2 (1)	10-min	-	-(-)	397(416)	416	397	**712**
	1-hour	-	-(-)	301(316)	316	301	**570**
	24-hour	-	12.4(12.6)	-(-)	35.5	33.6	**228**
	Annual	1.54	-(-)	-(-)	-	3.10	**60**
NO_2 (1)	1-hour	-	-(-)	156(201)	201	156	**246**
	Annual	22.0	-(-)	-(-)	-	23.2	**62**
TOC(2)	1-hour	-	-(-)	9.66(10.5)	10.5	9.66	**29**
HCl(2)	1-hour	-	-(-)	29.0(31.4)	31.4	29.0	**140**
NH_3 (2)	1-hour	-	-(-)	14.5(15.7)	15.7	14.5	**330**
Hg(2)	1-hour	-	-(-)	0.017(0.018)	0.0183	0.02	**1.8**
Cd+Tl	1-hour	-	-(-)	0.010(0.011)	0.0105	0.01	**0.018**
Metals(2),(3)	1-hour	-	-(-)	0.145(0.157)	0.157	0.15	-

Pollutant	Averaging period	Predicted concentrations					Criteria
		SC1	SC2 - LP1(Max LP)	SC3 - LP1(Max LP)	SC4	EPA Limit Scenario	
Dioxins (2)	1-hour	-	-(-)	2.90x10^-8(3.14x10^-8)	3.14x10^-8	2.90x10^-8	**2.00x10^-6**
Cd(2)	1-hour	-	-(-)	0.005(0.006)	0.006	0.005	**0.018**
Tl(2)	1-hour	-	-(-)	0.005(0.005)	0.005	0.005	**-**
As(2)	1-hour	-	-(-)	0.004(0.004)	0.004	0.004	**0.09**
Co(2)	1-hour	-	-(-)	0.003(0.003)	0.003	0.003	**-**
Cr(2)	1-hour	-	-(-)	0.030(0.033)	0.033	0.030	**0.09**
Cu(2)	1-hour	-	-(-)	0.032(0.034)	0.034	0.032	**18**
Mn(2)	1-hour	-	-(-)	0.009(0.01)	0.010	0.009	**18**
Ni(2)	1-hour	-	-(-)	0.052(0.057)	0.057	0.052	**0.18**
Pb(1)	Annual	-	-(-)	0.0001(0.0001)	0.0001	0.0001	**0.5**
Sb(2)	1-hour	-	-(-)	0.003(0.003)	0.003	0.003	**9**
V(2)	1-hour	-	-(-)	0.002(0.002)	0.002	0.002	**-**
Be(2)	1-hour	-	-(-)	0.0004(0.0004)	0.0004	0.0004	**0.004**
Se(2)	1-hour	-	-(-)	0.011(0.012)	0.012	0.011	**-**
Sn(2)	1-hour	-	-(-)	0.01(0.011)	0.011	0.010	**-**

(1) Assessed at receptors
(2) Assessed at and beyond the boundary of the facility
(3) Metals include the sum of Sb + As + Pb + Cr + Co + Cu + Mn + Ni + V
* g/m²/month
SC1 / SC2 / SC3 / SC4 = Scenario 1 / Scenario 2 / Scenario 3 / Scenario 4
MAX LP = the most impacting load point
Note: exceedances of criteria are highlighted as red bold text

Table 8.5 also presents cumulative impacts but with the Next Generation Energy from Waste Facility (currently subject to proceedings in the NSW Land and Environment Court) added to the ambient background level to represent a conservative or worst-case scenario.

Table 8.5: Cumulative dispersion modelling results, maximum predicted concentrations – with background levels and Next Generation Energy from Waste Facility

Pollutant	Averaging period	Predicted concentrations					Criteria
		SC1	SC2 - LP1(Max LP)	SC3 - LP1(Max LP)	SC4	EPA Limit Scenario	
$PM_{2.5}$(1)	24-hour	-	**30.2(30.3)**	-(-)	**33.5**	**33.2**	**25**
	Annual	**8.22**	-(-)	-(-)	-	**8.50**	**8**
PM_{10}(1)	24-hour	-	**69.3(69.4)**	-(-)	**72.7**	**72.4**	**50**
	Annual	17.6	-(-)	-(-)	-	17.9	**25**
TSP(1)	Annual	63.4	-(-)	-(-)	-	63.7	**90**
Deposition(1)	Annual*	2.80	-(-)	-(-)	-	2.81	**4**
HF(1)	24-hour	-	0.13(0.14)	-(-)	0.54	0.51	**2.9**
	7 days	-	0.09(0.1)	-(-)	0.37	0.34	**1.7**
	30 days	-	0.07(0.07)	-(-)	0.28	0.26	**0.84**
	90 days	-	0.05(0.06)	-(-)	0.22	0.21	**0.5**
SO_2(1)	10-min	-	-(-)	402(421)	421	402	**712**
	1-hour	-	-(-)	305(319)	319	305	**570**
	24-hour	-	12.7(13)	-(-)	35.8	34.3	**228**
	Annual	1.6	-(-)	-(-)	-	3.16	**60**
NO_2(1)	1-hour	-	-(-)	156(201)	201	156	**246**
	Annual	22.0	-(-)	-(-)	-	23.2	**62**
TOC(2)	1-hour	-	-(-)	9.75(10.5)	10.5	9.75	**29**
HCl(2)	1-hour	-	-(-)	29.7(32.1)	32.1	29.7	**140**
NH_3(2)	1-hour	-	-(-)	14.6(15.8)	15.8	14.6	**330**
Hg(2)	1-hour	-	-(-)	0.017(0.019)	0.0186076	0.02	**1.8**
Cd+Tl	1-hour	-	-(-)	0.01(0.011)	0.0111388	0.01	**0.018**
Metals(2),(3)	1-hour	-	-(-)	0.202(0.214)	0.213775	0.20	-

Pollutant	Averaging period	Predicted concentrations					Criteria
		SC1	SC2 - LP1(Max LP)	SC3 - LP1(Max LP)	SC4	EPA Limit Scenario	
Dioxins (2)	1-hour	-	-(-)	3.02x10^-8(3.26x10^-8)	3.26x10^-8	3.02x10^-8	**2.00x10^-6**
Cd(2)	1-hour	-	-(-)	0.006(0.006)	0.006	0.006	**0.018**
Tl(2)	1-hour	-	-(-)	0.005(0.005)	0.005	0.005	**-**
As(2)	1-hour	-	-(-)	0.006(0.006)	0.006	0.006	**0.09**
Co(2)	1-hour	-	-(-)	0.003(0.003)	0.003	0.003	**-**
Cr(2)	1-hour	-	-(-)	0.03(0.033)	0.033	0.030	**0.09**
Cu(2)	1-hour	-	-(-)	0.033(0.036)	0.036	0.033	**18**
Mn(2)	1-hour	-	-(-)	0.014(0.015)	0.015	0.014	**18**
Ni(2)	1-hour	-	-(-)	0.071(0.075)	0.075	0.071	**0.18**
Pb(1)	Annual	-	-(-)	0.0007(0.0007)	0.0007	0.0007	**0.5**
Sb(2)	1-hour	-	-(-)	0.004(0.005)	0.005	0.004	**9**
V(2)	1-hour	-	-(-)	0.002(0.002)	0.002	0.002	**-**
Be(2)	1-hour	-	-(-)	0.0004(0.0004)	0.0004	0.0004	**0.004**
Se(2)	1-hour	-	-(-)	0.011(0.012)	0.012	0.011	**-**
Sn(2)	1-hour	-	-(-)	0.01(0.011)	0.011	0.010	**-**

(1) Assessed at receptors
(2) Assessed at and beyond the boundary of the facility
(3) Metals include the sum of Sb + As + Pb + Cr + Co + Cu + Mn + Ni + V
* g/m^2/month
SC1 / SC2 / SC3 / SC4 = Scenario 1 / Scenario 2 / Scenario 3 / Scenario 4
MAX LP = the most impacting load point
Note: exceedances of criteria are highlighted as red bold text

Predicted maximum cumulative concentrations are below the relevant criteria, except for:

- Annual average $PM_{2.5}$ concentrations
- 24-hour average $PM_{2.5}$ and PM_{10} concentrations.

In these cases, the exceedance is due to the existing background level being above the criteria already.

Overall, the results show that the predicted cumulative impacts associated with the proposal at the receptor locations for all assessed pollutants are below criteria or are unlikely to result in any adverse additional cumulative impacts. For $PM_{2.5}$, the background levels are above the criteria, however the predicted incremental annual average contribution from the proposal alone is small and is not predicted to result in any noticeable impact relative to existing levels.

For 24-hour concentrations of $PM_{2.5}$ and PM_{10}, the existing exceedances triggers the application of an alternative EPA assessment method referred to as 'Level 2 assessment – Contemporaneous impact and background' as explained further in the Air Quality and Odour Impact Assessment attached as **Technical report A**. This method considers the change in the number of days which experience an exceedance of criteria as a result of the proposal. The results of this assessment indicate that the proposal does not increase the number of days above the 24-hour average criterion at the assessed receptors for $PM_{2.5}$ and PM_{10}.

The incremental results show that the maximum 24-hour average $PM_{2.5}$ and 24-hour average PM_{10} concentrations are small. As such, the proposal is expected to have a small influence at the assessed receptor locations which in most cases would be difficult to notice beyond the expected background level.

8.3.2.5 Ozone

An ozone assessment was undertaken in accordance with the NSW EPA's Tiered Procedure for Estimating Ground Level Ozone Impacts from Stationary Sources (NSW EPA, 2011).

The predicted incremental increase in 1-hour and 4-hour average ambient ozone concentrations is evaluated against a Screening Impact Level (SIL) of 0.5 parts per billion (ppb) and against the maximum allowable increment of 1ppb. If the maximum ozone increment is below the SIL and/or below the maximum allowable increment, an ozone Level 2 Refined Assessment is not required.

The results show that the predicted incremental increase in 1-hour and 4-hour average ambient ozone concentrations is below the SIL of 0.5 ppb, thus, no further ozone assessment is required.

8.3.2.6 Emissions from start-up and shutdown conditions

The EfW facility will be required to go through a start-up and shutdown process for inspection, maintenance or any unplanned stops. This process is automated with built in controls, monitoring and safeguarding to avoid the potential for significant emissions.

Auxiliary burners, fuelled by diesel, will be used during start-up conditions to reach operational combustion temperatures before any waste feedstock is added. An emergency diesel generator will also be available for safe shut-down of the proposal. The flue gas cleaning systems will be operational and will mitigate the release of air pollutants in the flue gas during start-up and shutdown procedures.

Additionally, the proposal will be equipped with an emergency feed water pump and induced draft fans connected to the emergency power systems for a safe shutdown, even if an electricity blackout occurs.

Other essential components such as the boiler, flue gas treatment and turbine will also be connected to this emergency power system that enables a safe shutdown of the boiler by allowing it to cool before the air flows through the facility and flue gas treatment system is fully shut off.

Any emissions from the auxiliary burners and emergency diesel generator during start-up/ shutdown procedures are exempt from regulation as they occur too infrequently and can’t be reasonably quantified. However, as a means to approximately estimate emissions likely to occur from start-up/shut-down procedures, emission factors for combustion of distillate (diesel) oil in boilers were obtained from the National Pollutant Inventory emission estimation technique manual.

Considering the relatively infrequent occurrence of start-up and shut-down procedures, the control systems in place, and that emissions from the combustion of diesel fuel would generally burn significantly more cleanly than solid waste fuels, emissions during start-up/shut-down conditions are not considered likely to result in any adverse impacts.

8.3.2.7 Emissions for upset conditions

Consideration of upset conditions (such as emergency shutdown and trip scenarios) have been represented in Scenario 4 by modelling the most elevated short-term emissions per the most impacting operational load point in each hour of the year, and also assuming this continues each hour for up to 24-hours before any shutdown is initiated.

Should the waste calorific value vary from the design point conditions, the combustion control system will adjust to reach the desired conditions to reach design point operation. In the case of a malfunction the facility will apply shutdown operations until design point operational processes can be restored. The proposal has installed some operational control measures processes to mitigate upset conditions and keep the plant operating within the design limits.

The shutdown process involves operating the pollution control equipment and maintaining sufficient air flows though the plant, making sure no adversely impacting emissions are released.

8.3.2.8 Worst-case assessment of deposited matter on Prospect Reservoir

Deposited dust at Prospect Reservoir as a result of the proposal is roughly between 0.00001 and 0.00003 g/m^2/month and is too low to be measurable or detectable. More detailed information is included in the AQOIA.

8.3.2.9 Odour

NSW legislation (*Protection of the Environment Operations Act, 1997)* prohibits emissions which cause offensive odour to occur at any offsite receptor.

The odour assessment indicates that odour levels due to the proposal will be at or below the applied odour assessment criterion of 2 Odour Units (OU) at all assessed receptors.

Odour emissions will be controlled during start-up and shutdown conditions by using induced draft fans (connected to the emergency power systems) to maintain airflows and make sure negative pressure is maintained in the building and also proper combustion conditions. Other essential systems will also be connected to this emergency power system that will enable a safe shutdown of the boiler by allowing it to cool before the air flows through the facility and flue gas treatment system is fully shut off. During a shutdown, building doors will also be closed to prevent odour impacts.

The waste bunker and tipping hall will also have an exhaust system equipped with an active carbon filter for odour control during standstill of the facility to mitigate odour escaping from the waste bunker and tipping hall if the boilers are not operating.

8.3.2.10 Transport

Traffic movements associated with the proposal have the potential to generate emissions primarily from hot exhaust emissions from diesel vehicles. Overall traffic numbers to and from the site are low in the context of traffic numbers on the surrounding road network, including the M7. In addition, the site would receive waste that is sourced in the general area and would otherwise have been transported to landfill. The actual number of vehicles on the roads near to residential receptors is not expected to change in any discernible way.

The proposal would result in a slight overall increase in road emissions. The fraction of emissions generated with or without the proposal is negligible compared to the total road emissions generated in each post code assessed. Thus, the changes in emissions from the transportation of materials on public roads are not expected to result in any adverse air quality impacts. and would be unlikely to be discernible from existing levels.

8.3.2.11 Ash management

Incinerator Bottom Ash (IBA) remaining after the combustion process is discharged into a water bath and quenched. The wet IBA is deposited onto a conveying system with bulky items or ferrous metal materials recovered. Following metals recovery, the residual bottom ash is securely stored before being transported offsite for recycling or disposal at a licensed facility.

Boiler Fly Ash is controlled via the flue gas cleaning system and the Flue Gas Treatment residues (FGTr) which comprises of the residual ash and spent reagents from the flue gas cleaning system is collected in the bag house filter.

FGTr will be handled in sealed conditions within the facility, and IBA will be handled in enclosed areas only. Due to the mitigation measures in place there is minimal risk of any dust from the handling and storage of ash entering the environment.

8.3.2.12 Commissioning

On completion of installation, testing of all major process components including emission control systems will be carried out. During commission the proposal will operate as though in full operation for limited periods.

Commissioning will include a proof of performance trial to demonstrate compliance with air quality standards. This is a normal and necessary part of commissioning to make sure the facility is operating to the appropriate standards.

Emissions during the commissioning period will be within relevant criteria.

8.3.2.13 Licence limits

The proposed in-stack emission limit concentrations for the proposal are outlined in **Table 8.6**. The limits are consistent with best-practice design limits for such plant.

Based on the predicted incremental and cumulative impacts, the facility can meet these in-stack concentrations without any adverse air quality impacts predicted to occur.

Table 8.6: Proposed in-stack emission limit concentrations for licence limits

Pollutant	Units	Modelled concentrations	
		Max 1/2-hour average[4]	Max 24-hour average[(4)]
CO	mg/Nm^3	100	50
TOC	mg/Nm^3	20	10
$PM_{2.5}$	mg/Nm^3	28.5	4.8
PM_{10}	mg/Nm^3	29.4	4.9
TSP	mg/Nm^3	30	5
HCl	mg/Nm^3	60	6
HF	mg/Nm^3	4	1
$SO_2 + SO_3$	mg/Nm^3	200	30
NO_x (calculated as NO_2)	mg/Nm^3	400	120
NH3	mg/Nm^3	30	10
Hg	mg/Nm^3	0.035	0.02
Cd+Tl	mg/Nm^3	0.02	-
Sb + As + Pb + Cr + Co + Cu + Mn + Ni +V	mg/Nm^3	0.3	-
Dioxins	ng/Nm^3	0.06	0.06

8.3.3 AQOIA conclusions

All predicted impacts associated with all emissions from the proposal are within the applicable emission limit values and impact assessment criteria, apart from cumulative ground level $PM_{2.5}$ and PM_{10} concentrations, due to the existing background levels which already exceed the criteria (as occurs across much of New South Wales). However, the predicted contribution by the proposal to ambient $PM_{2.5}$ and PM_{10} concentrations is small and would not result in any discernible or measurable impact.

[4] Dioxins, HF and some metals are normally measured over 4 to 8 hours (or longer periods) in order to collect sufficient material to enable detection.

The assessment covered a range of scenarios and included a cumulative impact assessment with the predicted emissions from the Next Generation Proposal which confirm impacts are within criteria.

The assessment applies conservative estimates for the plant emissions, consistent with the maximum potential levels that might be emitted, thus accounting for any potential variability in the feed waste material affecting the post-treatment emissions that may be released.

The proposal uses proven best-practice technology for the thermal treatment of waste. It is the only proposed energy EfW facility in New South Wales for which an EIS has been lodged and that commits to a combination of dry/wet flue gas treatment technology, resulting in significantly lower emissions than possible with only a dry/semi dry systems.

The air quality assessment indicates the proposal would not result in any significant affect to the surrounding environment or sensitive receptors.

8.4 Mitigation

Mitigation measures for operational air quality and odour impacts are embedded in the design of the proposal as discussed in **Chapter 3 Proposal description** and represent best available techniques as demonstrated in the BAT Report (**Technical report D**). The proposal has been designed to meet the European Industrial Emissions Directive (IED) (directive 2010/75/EU of the European Parliament) and fulfils the best available techniques (BAT) criteria as defined by the 37 BAT-conclusions in the *Commission Implementing Decision (EU) 2019/2010 Of 12 November 2019 Establishing The Best Available Techniques (BAT) Conclusions, Under Directive 2010/75/Eu Of The European Parliament And Of The Council, For Waste Incineration.*

The main design features related to air quality and odour mitigation impacts are described in **Table 8.7** along with measures to manage construction related dust.

Table 8.7: Air quality and odour impact mitigation measures

ID	Potential impact	Proposed mitigation
Design embedded		
AQ1	Variation in emissions due to variation in the waste feed stock	Overhead cranes are used to mix waste in the waste bunker, extract any obvious items that are out of specification, and load the process lines via the feed hopper into the boiler. The active mixing of the waste is designed to increase the waste homogeneity, which helps to minimise operation fluctuations and variation in emissions. The combustion system and boiler has been designed to operate at a range of operating conditions.
AQ2	Emissions from stack beyond predicted emissions	The proposal flue gas treatment system will include: • A Selective Non-Catalytic Reduction (SNCR) with ammonia injection system for the removal of NO_x • Combined dry/wet system comprising of bag filters, activated carbon injection and hydrated lime injection • Post-flue-gas polishing scrubber designed to allow emission limit values to be achieved under a range of operating scenarios. The proposed flue gas treatment system represents best practice and best available technology. WSERRC is the only proposed EfW facility in New South Wales for which an EIS has been lodged and that commits to a combination of dry/wet flue gas treatment technology.
AQ3	Higher than expected emissions due to incomplete combustion of waste feedstock	The boiler will include an advanced moving grate mass burn technology with the main combustion air supplied from below the moving grate, heated to a level designed to achieve complete combustion of feedstock. Movement of the grate floor components will also agitate the waste to optimise complete combustion.
AQ4	Emissions from stack beyond predicted emissions	Each grate line will be equipped with a Continuous Emissions Monitoring System (CEMS) (including redundant back up) to allow for continuous monitoring of the flue gas so the proposal is compliant with the licence limits. This also helps in providing real-time feedback to the control systems to make automatic adjustments to the combustion system and the injection rates for the flue gas cleaning system process.
Construction		
AQ5	Dust associated with materials handling such as earthworks impacting on workers onsite and receptors offsite	Construction dust will be managed through a Dust Management Plan integrated with the CEMP which will include water application for dust suppression, wheel washing of construction vehicles to prevent tracking of dirt/dust offsite and management of stockpiles to limit wind-blown dust.
AQ6	Dust/particulates associated with diesel engines impacts on workers onsite and receptors offsite	Construction particulates from diesel engines will be managed through measures in the CEMP which will include minimising engine idling and operating and maintaining equipment correctly.

ID	Potential impact	Proposed mitigation
Operation		
AQ7	Fugitive odour emissions from the EfW facility	Waste will be transported to the facility in enclosed trucks and unloaded in the waste receiving hall which will be fully enclosed, with fast-acting roller shutter doors, operating under negative pressure to contain odours from the waste tipping process and the bunker. The air from the waste hall passes into the boiler and is destroyed in the combustion process.
AQ8	Fugitive odour emissions from the EfW facility when boilers not operating	The waste bunker and tipping hall will also have an exhaust system equipped with an active carbon filter for odour control during standstill of the facility, to mitigate odour escaping from the waste bunker and tipping hall if the boilers are not operating.
AQ9	Combustion of unacceptable waste	Hazardous waste is explicitly excluded from the incoming waste stream. The proposal has developed protocols to manage and mitigate any potential unacceptable waste, such as inspection regimes and scanning for radioactive materials.
AQ10	Odour from transport of waste	Waste will be transported to the facility in enclosed vehicles, which will minimise the potential for fugitive odour emissions.
AQ11	Proof of Performance Trials	Before beginning of operations, a Proof of Performance trial will be carried out in line with an agreed plan, to test all major process components including emission controls and demonstrate compliance with approved criteria.
AQ12	Dust from ash handling and storage	All ash handling takes place inside the facility. FGTr are stored in sealed silos and transported in sealed trucks. IBA is quenched (wet) and stored in an enclosed bunker and building.

Chapter 9

Human health risk

9 Human health risk

9.1 Introduction

This chapter summarises the potential human health impacts from the proposal. A Human Health Risk Assessment (HHRA) has been carried out for the proposal and is in **Technical report B.**

The approach to preparing the HHRA involved:

- Determining the location and characteristics of the population surrounding the site
- Assessing potential health impacts as a result of the proposal from all exposure pathways including inhalation, ingestion and dermal
- Assessing the potential impacts on drinking water sources such as Prospect Reservoir and rainwater tanks, including potential impacts on water quality and human health
- Carrying out an uncertainty assessment of the findings
- Developing mitigation measures to manage impacts on human health.

The HHRA was carried out in line with the following guidelines:

- Environmental Health Risk Assessment Guidelines for Assessing Human Health Risks from Environmental Hazards (enHealth, 2012)
- Australian Exposure Factors Guide (enHealth, 2012)
- National Environment Protection (Ambient Air Quality) Measures (National Environment Protection Council (NEPC), 2016)
- National Environment Protection (Air Toxic) Measures (NEPC, 2004)
- Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (NSW, Environment Protection Authority (EPA), 2016).

9.2 Existing environment

9.2.1 Land use

The nearest residential area is about 1km to the south of the site in Horsley Park with the Minchinbury residential area located about 3km to the north-west. Horsley Park Public School is over 2km south of the site and a childcare centre is within the Eastern Creek industrial area about 1km to the west of the site.

The site is bounded by the Westlink M7 Motorway to the west with the Eastern Creek industrial area located farther west. The SUEZ Eastern Creek Waste Management Centre, comprising the now-closed landfill site and operational organics recycling facility is located to the north and north-east, with the operational Global Renewables waste management facility located immediately to the east. To the south, the site is bounded by the Warragamba Pipeline Corridor with the Austral Bricks facility located farther south. Prospect Reservoir is located about 1.5km to the east of the proposal site.

9.2.2 Salmonella on site

The proposal site has been used for mixed-use commercial and industrial activities, including a poultry factory farm. A Biosecurity Direction was issued to the previous site owner dated 24 January 2019 from the Department of Primary Industries (DPI) about the presence of Salmonella on site. The current site owners worked with DPI to resolve the Salmonella issue in line with current procedures. The applicant has since received a letter from DPI dated 26 May 2020 which confirmed the site is now considered a 'resolved premise' and the Biosecurity Direction has been revoked.

9.2.3 Contamination on site

A Detailed Site Contamination Investigation (DSI) was carried out and is in **Technical report G**, which concluded that the proposal site is considered to have a low water and vapour contamination risk. However, it found a low to moderate risk for soil contamination, primarily from asbestos. Asbestos containing material (ACM) was found near surface soils and within existing buildings on site.

9.2.4 Community profile

This section provides an overview of the community who would be potentially affected by the proposal. The site is located near the southern boundary of Blacktown Local Government Area (LGA) where it meets the northern boundary of Fairfield LGA. Health statistics have been obtained for these LGAs and the Western Sydney Local Health District and are compared to the NSW statistics. The data has been sourced from the 2016 Census and 2016 Socio-Economic data from the Australian Bureau of Statistics (ABS) and NSW Health data. A detailed community profile is provided in Section 3 of the HHRA.

9.2.4.1 Population

In comparison to New South Wales overall, the Blacktown LGA and Fairfield LGA community has a:

- Lower proportion of people over 65
- Lower median age (for Blacktown LGA), and similar median age (Fairfield LGA)
- Higher proportion of people under 19
- Similar proportion of First Australians (Blacktown LGA), higher proportion of First Australians (Fairfield LGA)
- Higher unemployment
- Higher proportion of people born overseas
- Higher household size
- Similar proportion of people with tertiary education.

9.2.4.2 Health

The health of the community is influenced by a complex range of interactive factors including:

- Age
- Socio-economic status
- Social capital
- Behaviours
- Beliefs and lifestyle
- Life experiences
- Country of origin
- Genetic predisposition
- Access to health and social care.

The health indicators available and reviewed in the HHRA report generally reflect a wide range of these factors and include health-related behaviours and indicators for the burden of disease within the community.

Table 9.1: Summary of health indicators

Health indicator/data	Blacktown LGA	Fairfield LGA	Western Sydney Local Health District	NSW
Health behaviours				
Adults – compliance with fruit consumption guidelines (2019)[1]	Not available	Not available	36.7% (32.1–41.3%)	40.6% (39.0– 42.1%)
Adults – compliance with vegetable consumption guidelines (2019)[1]	Not available	Not available	4.7% (2.3–7.1%)	6.3% (5.5–7.1%)
Adults – alcohol consumption at rates posing increased long-term risk to health (2018)[1]	Not available	Not available	23.9% (20.2–27.6%)	31.5% (30.2–32.9%)
Adults – body weight (overweight or obese) (2018)[1]	Not available	Not available	55% (50.8–59.2%)	54.2 % (52.8–55.7%)
Adults – insufficient physical activity (2019)[1]	Not available	Not available	44.7% (39.7–49.7%)	38.5% (37.0–40.1%)
Current smoker (2018)[1]	Not available	Not available	8.5% (6.1–10.8%)	10.3% (9.4–11.2%)
Burden of disease				
Morbidity - cardiovascular disease hospitalisations (2018/19)[1]	1830* (1814.7–1845.7)	1395.4* (1374–1417.2)	1587.2* (1562.1–1612.6)	1672.4* (1664.1–1680.7)
Morbidity – respiratory disease hospitalisations (2018/19)[1]	Not available	Not available	1647* (1622–1672.3)	1675.2* (1666.4–1684)
Mortality – all causes (2017)[1]	570.8* (551–591.2) (2016/17)	489.8* (469.6–510.7) (2016/17)	483.7 (469.3–498.5)	508.8* (504.4–513.3)
Prevalence of asthma (adult) (2019)[1]	Not available	Not available	11.7% (8.7–14.8)	11.5% (10.5–12.5)
Prescriptions for asthma medication (adult) rate per 100,000 adults across 2013/14	22193	23171	Not available	Not available
Prevalence of asthma (child) (2017–19)[1] (current asthma data)	Not available	Not available	10.4% (6.8–14.1)	13.1% (11.8–14.4)
Prescriptions for asthma medication (child) Rate per 100,000 children across 2013/14	36086	51259	Not available	Not available

[1] Data form Health NSW Health Stats
*Rate per 100,000 population (age-standardised)

Shading relates to comparison against New South Wales:

- Pink: statistic/data suggestive of a potential higher vulnerability within the population to health stressors
- Blue: statistic/data suggestive of a potential lower vulnerability within the population to health stressors.

When considering the data for the Western Sydney Local Health District in comparison to New South Wales, Western Sydney has:

- Lower rates of consumption of fresh fruit and vegetables
- Lower rates of harmful alcohol consumption
- Similar levels of higher body weights, hospitalisations due to respiratory disease, mortality (all-causes) and prevalence of asthma in adults
- Higher rates of poor physical activity
- Lower rates of smoking
- Lower rate of hospitalisation due to cardiovascular diseases
- Lower rate of asthma in children.

In comparison to New South Wales, Blacktown LGA has:

- Higher rates of hospitalisation due to cardiovascular diseases (including chronic obstructive pulmonary disease (COPD))
- Higher mortality rate (all causes).

In comparison to New South Wales, Fairfield LGA has:

- Lower rates of hospitalisation due to cardiovascular diseases (including COPD)
- Similar mortality rate (all causes).

In general, the main indicators of health for the community around the proposal are somewhat similar to those for New South Wales. There are some characteristics which suggest a population that is potentially more vulnerable to health stressors and some characteristics which suggest a population that is less vulnerable to health stressors.

9.3 Assessment

9.3.1 Construction impacts

Construction activities will involve demolition of existing buildings, vegetation clearing and earthworks, all of which can cause the mobilisation of dust, and cause impacts to human health if not managed appropriately.

These activities and dust emissions will be temporary throughout the construction period. As part of the Air Quality and Odour Impact Assessment (AQIOA) (**Technical report A**) a qualitative and quantitative analysis of dust emissions has been completed and it concluded that the potential for dust emission was elevated due to the size of the site and construction vehicles needed. However, the potential for risks to health is low due to the distance to sensitive receivers.

Several mitigation measures will be employed to manage dust during construction, these are outlined in **Chapter 8 Air quality and odour.**

The DSI results showed elevated levels of asbestos in soil and buildings which could cause adverse impacts to human health if not managed correctly. A draft Remediation Action Plan (RAP) has been prepared and will be updated and applied to manage contaminated material ensuring safety for construction workers and remediation of the site to render the site suitable for the proposed land use. With the use of this RAP, any impacts to human health are considered negligible.

9.3.2 Operation impacts

9.3.2.1 Exposure pathways

There are three main exposure pathways by which a person may be exposed to a chemical substance emitted from the proposal:

- Inhalation (breathing it in)
- Ingestion (eating or drinking it – directly or indirectly)
- Dermally (absorbing it through the skin).

Certain substances can only be exposed to people via certain pathways.
A summary of the substances that will be emitted from the proposal and the likely exposure pathways is shown below.

Table 9.2: Substances that will be emitted from the proposal and route of exposure

Substance	Route of exposure
Nitrogen dioxide (NO_2) Sulfur dioxide (SO_2) Hydrogen chloride Hydrogen fluoride Carbon monoxide (CO) Total organic compounds Ammonia	Inhalation only as these are gases.
Particulate Matter (PM) - PM_{10} $PM_{2.5}$	Inhalation (assuming no deposition occurs) as these particulates are very small and will remain suspended in the air. Ingestion and dermal contact from other exposure pathways have also been assessed for the individual chemical substances bound to these particles. These other pathways relate to the individual chemical substances, rather than the physical size of the particulates and assume these particles settle to the ground.
Antimony Arsenic Beryllium Cadmium Chromium Cobalt Copper Lead Manganese Mercury Nickel Selenium Thallium Tin Vanadium Dioxins and furans	Inhalation of these pollutants which have adhered to fine particulates. Ingestion and dermal contact with these pollutants deposited to soil. Ingestion of produce grown in soil potentially impacted by these pollutants (for example homegrown fruit and vegetables and eggs – where the pollutants can be taken up/bioaccumulated into plants and animals). As the area surrounding the site includes some rural land use, the raising of livestock for meat or milk has been assessed.

9.3.2.2 Approach to assessment

The HHRA relies on the air quality modelling produced in the Air Quality and Odour Impact Assessment (AQOIA) (**Technical report A**). The proposal will need to operate within emission limit values set by the Environment Protection Licence (EPL). These values set the limits on concentrations of pollutants in the stack before discharge and have been used in the AQOIA to demonstrate that impacts at receptors are within criteria. The EfW process is designed to operate within these emission limit values (ELVs) considering variations in the composition of waste feedstock. The continuous emissions monitoring system (CEMS) will make sure that any exceedances of the ELVs will either be immediately corrected or will result in an automatic shutdown of the operating line.

The HHRA has considered the location where maximum impacts from the proposal may occur across a defined study area known as a grid (which was used in **Technical report A Air quality and Odour Impact Assessment**). The HHRA assessed the estimated ground level concentrations of pollutants at the following locations across the grid:

- Maximum offsite location (anywhere beyond the site)
- Maximum residential location
- Maximum commercial/industrial location
- Maximum other places (such as childcare or community centre)
- Maximum onsite (for visitors to the facility).

These grid locations are different for each pollutant.

Using the maximum value in each of these categories results in an estimate of risks for the worst-case scenario. All other locations in each of these categories will have lower risks than these and so demonstrating that the risks for these locations are acceptable confirms that the risks at all locations are acceptable.

9.3.2.3 Criteria pollutants

Criteria air pollutants are those that are targeted by the National Environment Protection Measures (Air Quality) (NEPC, 2016). They are common air pollutants that need to be managed to maintain acceptable air quality. The criteria pollutants are PM_{10}, $PM_{2.5}$, NO_2, SO_2 and CO. These pollutants can result in respiratory impacts and CO in particular can also prevent oxygen from being transported around the body.

The HHRA uses information from the AQOIA which compares the existing concentrations of criteria pollutants with the proposal emissions and the relevant Australian guidelines for these pollutants (NEPC, 2016).

The results for the maximum offsite locations are shown in **Table 9.3.** Further detail of each criteria pollutant is provided in Section 5.3 of the HHRA.

Table 9.3: Criteria pollutants (maximum offsite location)

Scenario	SO_2 (µg/m³)	NO_2 (µg/m³)	CO (µg/m³)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)
Guideline	**60**	**62**	**10000**	**8**	**30**
Averaging period	Annual average	Annual average	8-hour average	Annual average	Annual average
Contribution from proposal	0.006	1.47	94	0.02	0.02
% contribution from proposal (compared to NEPM guideline value)	0.3%	2.3%	0.9%	4.3%	1.2%
Proposal plus background	1.6	22	1655	8	18
Proposal plus background and Next Generation facility	1.6	22	1657	8	18

For SO_2, NO_2 and CO criteria pollutants, the levels contributed by the proposal are low and the cumulative concentrations (including background and the Next Generation facility) are well below the relevant guidelines.

For PM, levels contributed by the proposal are low, but the overall cumulative concentrations are similar to the National guidelines. The AQIA provides further assessment of these criteria pollutants which confirm that background concentrations of PM are already high and the small contribution from the proposal does not change the number of days per year for which particles might be at or above the National guidelines. Section 5.3.4 provides a detailed assessment of risk due to exposure, which confirms the change in health impacts will be negligible.

9.3.2.4 Other pollutants

For all other pollutants which are not criteria pollutants, various exposure pathways have been considered. For inhalation exposures, this includes both acute exposures (short-term) and chronic exposures (long-term). For all other exposure pathways, long-term exposures are considered.

Details of the method and calculations of this assessment are in Appendix B of the HHRA. All assessments considered two of the scenarios outlined in the AQOIA. The first scenario (referred to as Scenario 1 in the AQOIA) represents the maximum annual average regulatory limit emissions to be released from the stack. The scenario evaluates annual average impacts.

The second scenario (referred to as the EPA limit modelling scenario in the AQOIA) conservatively assumes maximum regulatory limit hourly emissions at all hours of the year to be released from the stack. It is noted that this scenario cannot actually occur, and it has been modelled to conservatively estimate hypothetical maximum impacts for a regulatory limit scenario.

Inhalation short-term exposure

The assessment of short-term exposures used the maximum one-hour average ground level concentration at the worst case location (maximum offsite location) and compared that value to public health based guidelines for exposure over one hour. The ratio of the maximum predicted concentration of pollutant to the short-term guideline is called a risk quotient (RQ). When the maximum predicted concentration for an individual pollutant is less than the guideline value, the RQ is less than one. To assess the exposure to a mix of pollutants, all RQs are summed to give a risk index (RI).

Table 9.4: Short-term exposure and risks (maximum offsite –one hour average)

Pollutants	Acute air guideline (1-hour average) (mg/m^3)	Modelled air concentration		Calculated RQ Maximum – Regulatory
		(µg/m3)	(mg/m3)	
Hydrogen chloride (HCl)	0.662	80	0.08	0.12
Hydrogen fluoride (HF)	0.062	5.3	0.0053	0.089
Ammonia	0.182	40	0.04	0.22
Cadmium	0.00542	0.014	0.000014	0.0026
Thallium	0.0012	0.012	0.000012	0.012
Beryllium	0.00234	0.0011	1.1x10-06	0.00049
Mercury	0.00063	0.046	0..000046	0.077
Antimony	1.54	0.0083	8.3x10-06	5.5 x 10-06
Arsenic	0.0032	0.01	0.000010	0.0034
Lead	0.154	0.028	0.000028	0.00019
Chromium (VI)	0.00132	0.083	0.000083	0.064
Cobalt	0.00022	0.0088	8.8x10-06	0.044
Copper	0.13	0.087	0.000087	0.00087
Manganese	0.00912	0.024	0.000024	0.0027
Nickel	0.00112	0.14	0.00014	0.13
Selenium	0.0022	0.028	0.000028	0.014
Vanadium	0.022	0.0048	4.8x10-06	0.00024
Tin	0.022	0.029	0.000029	0.0015
Dioxins & furans (PCDD/PCDF WHO TEQ)[2]	1.34 x 10-06	1.1x10-07	1.1x10-10	0.000085
Benzene#	0.172	27	0.027	0.16
Total RI				**0.94**
Target (acceptable RI)				**<1**

Risks associated with short-term inhalation exposure are compliant with relevant guidelines when all individual risk quotients and the total risk index are less than or equal to one. Based on the results, the individual risk quotients are between 5 and 100,000 times lower than the relevant guidelines. The total risk index (sum of all the risk quotients for each pollutant) is also below one.

Short-term exposures at the most affected location (maximum offsite location) do not pose an unacceptable risk based on the Australia health authority guidelines. There are no short-term exposure inhalation risks for the proposal.

[2] Polychlorinated dibenzo-p-dioxins/dibenzofurans World Health Organisation total toxicity equivalent

Long-term exposure pathways

In additional to inhalation, other exposure pathways can have long-term impacts. Where pollutants may be bound to particles or are persistent in the environment and have the potential to bioaccumulate in plants or animals, it is relevant to also assess potential exposures that may occur as a result of particles depositing onto soil where a range of other exposures may then occur.

These exposure pathways include:

- Incidental ingestion and dermal contact with soil
  (and dust indoors that is derived from outdoor soil or deposited particles)
- Ingestion of homegrown fruit and vegetables where particles may deposit onto the plants and is also present in the soil where the plants are grown, and where pollutants bound to these particles are taken up into these plants
- Ingestion of eggs where particles may deposit onto the ground and be present in soil (which the pasture/feed grows in and animals also ingest when feeding), and the pollutants bound to these particles are taken up into the eggs
- Ingestion of milk where particles may deposit onto the ground and be present in soil (which the pasture/feed grows in and animals also ingest when feeding), and the pollutants bound to these particles are taken up into milk (consumed on farm)
- Ingestion of meat where particles may deposit onto the ground and be present in soil (which the pasture/feed grows in and animals also ingest when feeding), and the pollutants bound to these particles are taken up into meat (consumed on farm)
- Dermal contact or ingestion from water in rainwater tanks.

A summary of the long-term exposure pathways is shown in **Table 9.5.**

Table 9.5: Receptors and possible exposure pathways

Receptor	Media	Exposure pathway				
		Inhalation	**Ingesting of soil**	**Dermal contact with soil**	**Ingestion of eggs/fruit/ milk/meat/rainwater tank water**	**Dermal contact of water from rainwater tank**
Maximum offsite	Gases	✓	✕	✕	✕	✕
	Particles	✓	✓	✓	✕	✕
Maximum residential	Gases	✓	✕	✕	✕	✕
	Particles	✓	✓	✓	✓	✓
Maximum commercial/ industrial	Gases	✓	✕	✕	✕	✕
	Particles	✓	✓	✓	✓	✓
Maximum other places	Gases	✓	✕	✕	✕	✕
	Particles	✓	✓	✓	✓	✓
Maximum onsite	Gases	✓	✕	✕	✕	✕
	Particles	✓	✕	✕	✕	✕

Sections 5.4.3.2 to 5.4.3.6 and Section 5.4.4 assess the risks for each exposure pathway. A summary of these results is provided in **Table 9.6** and **Table 9.7.** These tables show the total risks for all exposure pathways for Scenario 1 and the EPA limit modelling scenario which are calculated by adding the risk quotients for all pollutants.

Table 9.6: Calculated risks – Scenario 1

Location	Risk			
	Inhalation	Deposition[3]	Rainwater tank[4]	Total
Guideline	**<1**	**<1**	**<1**	**<1**
Maximum offsite	0.01	0.04	NA	0.05
Maximum residential	0.009	0.007	0.0005	0.02
Maximum commercial	0.003	0.01	0.002	0.02
Maximum other places	0.004	0.003	0.0004	0.007
Maximum farm	0.005	0.02	0.0002	0.03
Maximum onsite	0.002	0.003	N/A	0.005
Maximum commercial (as residential)	0.01	0.03	0.002	0.04
Maximum other places (as residential)	0.01	0.003	0.0004	0.0.1
Prospect Reservoir	N/A	0.0008	N/A	0.0008
Maximum offsite with the Next Generation facility (cumulative impacts)	0.03	0.06–0.2	N/A	0.09–0.2

Table 9.7: Calculated risks – EPA limit modelling scenario

Location	Risk			
	Inhalation	Deposition[3]	Rainwater tank[4]	Total
Guideline	**<1**	**<1**	**<1**	**<1**
Maximum offsite	0.09	0.1	N/A	0.2
Maximum residential	0.06	0.02	0.001	0.08
Maximum commercial	0.02	0.04	0.004	0.06
Maximum other places	0.02	0.01	0.0009	0.03
Maximum farm	0.07	0.1	0.0005	0.2
Maximum onsite	0.009	0.01	N/A	0.02
Maximum commercial (as residential)	0.06	0.1	0.004	0.2
Maximum other places (as residential)	0.06	0.02	0.0009	0.08
Prospect Reservoir	N/A	0.003	N/A	0.003

[3] Deposition pathway includes ingesting soil, dermal contact with soil, ingestion of eggs/fruit/milk/meat.
[4] Rainwater tank pathway includes dermal contact with and ingestion of water from rainwater tank.

The HHRA concludes that for all possible exposure pathways, the total risk will be lower than the relevant guidelines issued by health authorities. The proposal does not cause any unacceptable human health risks for these exposure pathways.

Rainwater tanks

The impacts on rainwater tanks have been estimated using the maximum deposition rate for each pollutant at the worst-case location for residential and commercial/industrial land uses. The estimated concentrations of pollutants in a rainwater tank have been assessed considering both ingestion and direct contact exposure pathways.

The estimated concentrations in rainwater tanks are at least 250 times lower than the Australian Drinking Water Guidelines from NHMRC (2018) (see Section 5.4.6 of the HHRA). The total risk for Scenario 1 and the EPA limit modelling are shown in **Table 9.6** and **Table 9.7.**

Prospect Reservoir

The impacts on Prospect Reservoir have been assessed by comparing the estimated proposal pollutant concentrations at Prospect Reservoir with the Australian Drinking Water Guidelines (NHMRC) (updated 2018).

The estimated concentrations in Prospect Reservoir are at least 5000 times lower than the individual drinking water guidelines that apply for each pollutant. When the risks for each individual pollutant are summed, the overall risk is 1000 times lower than the guidance issued by health authorities as acceptable (See Section 5.4.4.7 of the HHRA). The total risk for Scenario 1 and the EPA limit modelling scenario are shown in **Table 9.6** and **Table 9.7.**

The State Environmental Planning Policy (Western Sydney Parklands) 2009 provides that development consent must not be granted to any development on land in the Western Parklands unless the consent authority is satisfied that the development will have a neutral or beneficial impact on the quality of the water in the bulk water supply infrastructure shown on the Bulk Water Supply Infrastructure Map.

The bulk water supply infrastructure includes the pipelines supply water to Prospect Reservoir and Prospect Reservoir itself.

The operation of the proposed facility will have a neutral impact on the quality of water within enclosed pipes as there is no mechanism for exposure to any emissions from the facility.

There is potential for the deposition of pollutants through air emissions onto the surface water of Prospect Reservoir and for runoff from the Prospect Reservoir catchment. The HHRA concludes that the proposal will cause an immeasurably small change to concentrations of chemicals which are naturally occurring and already present in most waterways and will have a neutral impact on Prospect Reservoir.

9.3.2.5 Impacts from the storage and transportation of waste material and dangerous goods

The construction and operation of the proposal will result in additional traffic generation of both heavy goods vehicles and smaller vehicles. Compared to the existing transport environment surrounding the proposal site (such as the M7), the additional construction vehicle movements are low and would not cause a noticeable difference in air quality. To assess the potential air quality impacts from additional truck movements during operation of the proposal, the AQIA has modelled the change in expected emissions from truck movements within 10km of the proposal. The assessment considered the proposed truck movements for transporting waste to the proposal, compared to existing truck movements for transporting waste to landfill. The change in emissions (expressed as a fraction of total road emissions) are: 0.01% for NO, 0.07% for PM and 0.02% for volatile organic compounds. These changes in emissions will be negligible relative to the current emissions and any health impacts from the increase in vehicles as a result of the proposal are expected to be negligible.

The EfW process will create three types of ash material: Incinerator bottom ash (IBA), boiler fly ash and flue gas treatment residues (FGTr). Other dangerous goods will also be stored on site as outlined in **Chapter 14 Hazards and risk**. If not managed appropriately, these dangerous goods could leach into soil and groundwater, creating another pathway for human health risk.

Measures to contain and safely handle these materials are outlined in **Chapter 3 Proposal description** and assessed in **Chapter 14 Hazards and risk**.
The management measures make sure that there is very low potential for any leaching of dangerous goods from the proposal which could cause human health impacts.

9.3.3 Assessment summary

The HHRA draws the following conclusions:

- No unacceptable risks for criteria pollutants including NO_2, SO_2, CO, $PM_{2.5}$, PM_{10}.
- No unacceptable risks for short-term exposures from the proposal at the maximum offsite location. All other locations will have lower concentrations, so risks will be lower.
- No unacceptable risks for relevant exposure scenarios considering long-term exposures at all locations.
- No unacceptable risks for relevant exposure scenarios for rainwater tanks or Prospect Reservoir.
- The transport of waste to the site has shown minimal changes to the existing situation along the proposed route, so no change in health impacts is expected.

9.4 Mitigation

Based on this assessment there are no unacceptable human health impacts expected for the proposal as a result of the mitigation measures already embedded in the design and operational best-practice measures such as:

- Control of incoming waste feedstock
- Unloading of waste within the building
- Control of the combustion process
- Best Available Technology including the flue gas treatment system
- Continuous monitoring of emissions
- Proper operation and maintenance of the facility
- Enclosed storage of ash
- Transportation of waste using enclosed trucks.

Chapter 10

Waste management

10 Waste management

10.1 Introduction

As described in **Chapter 3 Proposal description**, the proposal involves the construction and operation of an EfW facility which will divert residual Municipal Solid Waste (MSW) and residual Commercial and Industrial (C&I) waste from landfill to recover energy.

The proposal will generate waste from construction activities and operational site use arising from maintenance, staff amenity spaces and the visitor and education centre. This chapter summarises the type and classification of waste generated and waste management approaches during construction and operation of the proposal. This chapter also outlines Cleanaway's commitments to support resource recovery by planning for separation of recoverable materials for high-value recycling on site. During the operational phase, source separation systems will be arranged for all relevant waste streams generated by onsite activities, including paper and card, comingled recyclables and food waste. This will enable residual waste from the site offices and visitor and education centre to be directed to energy recovery.

At this stage, detailed design has not been carried out. High-level estimates of waste generation rates have been developed for main waste streams during construction and operation, which supports the identification of potential impacts and mitigation measures. More refined waste estimation and management provisions will be detailed in the Construction Environmental Management Plan (CEMP) and Remediation Action Plan (RAP) as the proposal progresses. Detailed waste management provisions for site operation will be documented in the Waste Management Plan (WMP).

This chapter does not address waste inputs (feedstock) and outputs (ash residues from energy recovery) because they are core business for the facility. Details relating to these materials, including transport, handling and processing, are considered in **Chapter 3 Proposal description** and **Chapter 5 EfW policy**.

10.2 Existing environment

The site is currently inactive, with various disused buildings associated with a previous poultry facility. As such, the proposal site does not currently generate waste.

10.3 Assessment

Construction waste has been determined based on typical construction activities of this scale and site inspections, to detect potential land contamination and hazardous materials. Operational waste has been outlined based on typical waste generation in commercial and industrial activities similar to the site office and visitor and education centre.

10.3.1 Construction waste generation and management

Waste will be generated at the site during the construction and demolition (C&D) phase of the proposal. C&D waste will be managed in line with standard industry practice, to prevent environmental damage and, where possible, recover materials for reuse and recycling.

C&D waste management for the proposal is routine and adequately managed through standard industry practice. It will be documented in the CEMP and RAP before starting onsite works. The Waste Management Plan within the CEMP will outline:

- Types and volumes of waste likely to be generated
- The procedure for assessing, classifying and storing waste in line with the NSW EPA Waste Classification Guidelines[1]
- Storage and treatment of waste on the site, including stockpiles
- Methods of transport and disposal of wastes, including waste that possesses hazardous characteristics, so that any waste leaving the site is transported and disposed of lawfully and does not pose a risk to human health or the environment
- Opportunities for reducing waste, reusing materials and increasing recycling
- Requirements for compliance with the Waste Avoidance and Resource Recovery Act 2001
- The Resource Recovery Orders and Exemptions requirements applicable to the waste on site.

The largest waste streams likely to be generated during the construction phase will be demolition materials from the existing buildings on the site and removal of potentially contaminated soil across the site before the main works starting.

[1] NSW Environment Protection Agency, 2014. Available from: https://www.epa.nsw.gov.au/~/media/EPA/Corporate%20Site/resources/wasteregulation/140796-classify-waste.ashx

The existing site includes buildings associated with a disused poultry facility, which will be removed from the site before starting construction. A site audit was performed to detect hazardous materials and a draft Remediation Action Plan (RAP) has been prepared, suggesting appropriate management and remediation approaches. The main sources of hazardous material are:

- Existing buildings contaminated with asbestos containing material (ACM), lead paint and potential legacy chemical spills
- Non-friable ACM identified in site fill at some locations.

Approaches to safely remove this material and remediate the site are outlined in **Technical report G1 Remediation Action Plan**. This includes inspection and removal of ACM from buildings by appropriately licensed contractors before demolition and inspection and testing of building footprints for soils contamination before excavation works. A CEMP will be developed before construction for the appropriate management of waste on the site, having regard for the RAP for hazardous waste. All waste for disposal will be classified, transported from site and disposed of in line with the Waste Classification Guidelines.[2].

Preliminary earthworks design indicates a small net import of fill to the site, as outlined in **Table 10.1**. The construction works will aim to minimise disposal of waste soil by:

- Reusing clean excavated material onsite
- Minimising excavation of contaminated material and considering onsite capping and immobilisation where appropriate.

Table 10.1: Preliminary earthworks estimates

Earthworks material	Approximate volume
Reuse of in-situ materials (includes clean excavated material and ACM-contaminated material which is remediated according to the RAP)	50,000m^3
Imported fill material	11,000m^3
Unsuitable material removed from site	4,000m^3

At least seven species of high-threat weeds were identified during site biodiversity surveys. A weed management plan will be developed, specifying appropriate control and disposal measures to minimise impacts associated with the spread of weeds and plant pathogens. The CEMP will reflect these measures.

[2] NSW Environment Protection Agency, 2014. Available from: https://www.epa.nsw.gov.au/~/media/EPA/Corporate%20Site/resources/wasteregulation/140796-classify-waste.ashx

10.3.2 Operational waste generation and management

The site will generate small amounts of operational waste from the site office, visitor and education centre, delivery of consumables and maintenance works. These waste streams will comprise typical commercial and industrial waste. Cleanaway is committed to demonstrating best practice in waste management and resource recovery by ensuring that source separation systems are in place for all relevant operational waste streams. This includes paper and card, comingled recyclables and food organics. Operational waste streams are documented in **Table 10.3** and are expected to include:

- General solid waste from site office spaces and the visitor and education centre
- Source-separated food organics from office lunchrooms and visitor and education centre canteen
- Comingled recycling from site office spaces and the visitor and education centre
- E-waste from end-of-life office equipment
- Pallets associated with deliveries and returned for reuse if possible
- Packaging associated with deliveries, potentially contaminated with chemical residues
- Minor waste streams of paints, solvents and other chemicals using in maintenance works, and related packaging
- Liquid effluent from site amenities, connected to the Sydney Water sewerage main via an onsite rising main and pump station.

An operational Waste Management Plan (WMP) will be developed during detailed design and will include:

- Types and volumes of waste expected to be generated
- Bin provision and sizing to support source separation of recyclable materials and hygienic storage of waste
- Bin storage locations and collection scheduling to preserve amenity
- Requirements for compliance with the Waste Avoidance and Resource Recovery Act 2001.

Preliminary waste generation has been estimated by applying the typical waste generation rates for offices, published in the City of Sydney Guidelines for Waste Management in New Developments 2018. The facility layout includes about 2,500m^2 of floorspace in the visitor and education centre and site offices which will generate operational waste similar to a commercial office.

The expected waste generation for major waste streams is:

- General residual waste: 2,600L/week
- Comingled recyclables: 4,400L/week
- Source-separated food waste: 900L/week.

Waste and recyclable materials will be removed from the site by appropriately licensed contractors and reused, recycled or disposed of at appropriately licensed facilities, in line with the NSW Waste Classification Guidelines. Minor waste streams, such as e-waste or waste arising from maintenance works, will be established in the WMP and serviced on an as-needed basis.

Cleanaway offers collection services for commercial and industrial waste as part of its core business and is likely to service the site during operation. Various other private service providers are also available.

Given that source separation systems will be in place to support high-value recovery of all relevant waste stream, the residual waste generated by the facility is 100% eligible for energy recovery under the NSW EfW policy. However, it will be transported over the property boundary and enter the facility via the weighbridge, before being deposited in the tipping hall. Residual waste from onsite operations will be subject to the same waste acceptance criteria as waste from external sources.

10.3.3 Summary of waste generation and management

Table 10.2 outlines the expected waste materials, expected classification and management pathways.

Table 10.2: Waste generation and management summary

Waste stream	Source	Phase	Estimated quantity	Expected waste classification under NSW Waste Classification Guidelines	Expected management pathway
Excavated soil Topsoil, subsoil, rock, gravel and silt	Excavation of the waste bunker and other site works	Construction	50,000m^3 reused onsite	General solid waste (non-putrescible) – pre-classified	Temporarily stockpiled for collection and offsite reuse, in line with the CEMP. The soil will be either virgin excavated natural material (VENM) or excavated natural material, covered by a current Resource Recovery Order and Exemption and suitable for reuse onsite or recovery on other construction projects.
Contaminated excavated soil Asbestos impacted soils, topsoil or fill material contaminated with ACM, hydrocarbons or other chemicals (for example, lead)	Excavation of contaminated fill or soils with surface contamination from previous land use.	Construction	4,000m^3 disposed offsite	Soil contaminated with ACM would initially be classified as special waste and need remediation in line with the RAP. Soil contaminated with hydrocarbons, lead paint or other chemicals could be classified as restricted or hazardous waste, depending on contaminant concentration and leachability, potentially requiring offsite remediation and/or disposal. Testing of building footprints will be carried out in line with the RAP.	The final RAP will define the preferred approach to fill contaminated with ACM. Proposed pathways in the draft RAP include: • Systematic excavation, inspection, manual removal of ACM and reuse of remediated fill • Capping and isolation within onsite landform • Offsite disposal (most expensive option, appropriate if material not needed on site).

Waste stream	Source	Phase	Estimated quantity	Expected waste classification under NSW Waste Classification Guidelines	Expected management pathway
Demolition waste Timber (painted/treated), metals, concrete, electrical and plumbing components	Existing buildings to be removed from site	Construction	19,000 tonnes[3]	General solid waste (non-putrescible) – pre-classified Some materials may be identified and classified as special waste (ACM) or restricted solid waste.	As per the draft RAP: • Inspection, removal of hazardous material by licensed contractors and demolition of remaining structures and disposal at appropriately licence facilities • Inspection and testing of building footprints to determine whether soil contamination has occurred • Segregation of materials, to support resource recovery where appropriate.
Green waste Trees, shrubs and weeds	Vegetation removed from cleared land	Construction and operation	Included within demolition waste estimate.	General solid waste (non-putrescible) – pre-classified	Temporary stockpiling onsite and removal for composting or disposal at licensed facilities. A site weed management plan will be developed, specifying measures to manage high-threat weeds identified on the site.
General construction waste Concrete, metal, timber, plastic wrapping and strapping, packaging, electrical and plumbing components	Offcuts, excess material, packaging	Construction	2,600m^3	General solid waste (non-putrescible) – pre-classified	Stored in onsite skip bins and transported offsite for disposal or recycling.

[3] Assuming exiting structures are steel framed and a demolition generation rate of 0.47t/m3 (WRAP Net Waste Tool – Demolition bill of quantities estimator. Available at: http://nwtool.wrap.org.uk/ToolHome.aspx)

Waste stream	Source	Phase	Estimated quantity	Expected waste classification under NSW Waste Classification Guidelines	Expected management pathway
Septic waste	Toilets for site workers	Construction	7,000L/week at peak construction	Liquid waste	Portable toilets provided and serviced by an appropriately licensed contractor. All liquid waste managed offsite at an appropriately licensed facility.
Scrap metal	Offcuts, damaged items	Construction	Included within total general construction waste estimate.	General solid waste (non-putrescible) – pre-classified	Stored in dedicated recycling bins for offsite transport to metal recycling facilities.
Wooden pallets	Materials delivery	Construction and operation	Not quantified, as generation will be linked to ad hoc site deliveries rather than regular generation.	General solid waste (non-putrescible) – pre-classified	Stored for reuse or returned to the supplier for reuse where possible.
General residual waste	Site offices and visitor and education centre	Operation	2,600L/week	General solid waste (non-putrescible) – pre-classified	Suitable for energy recovery without pre-sorting as source separations systems will be in place for all recyclable material streams. Stored in dedicated residual waste bins and transported across the weighbridge for reporting and inspection before energy recovery. Regular scheduled collection.
Food waste	Site office, workers lunch area, visitor and education centre	Operation	900L/week	General solid waste (putrescible) – pre-classified	Construction: Stored in residual waste bins and transported offsite for disposal. Operations: Stored in dedicated organics bins and transported offsite for composting. Regular scheduled collection.

Waste stream	Source	Phase	Estimated quantity	Expected waste classification under NSW Waste Classification Guidelines	Expected management pathway
Recyclable containers, paper and packaging	Site office, workers lunch area, visitor and education centre	Operation	4,400L/week	General solid waste (non-putrescible) – pre-classified	Stored in comingled recycling bins and transported offsite for recycling. Regular scheduled collection.
E-waste	Site office	Operation	Not quantified, as generation will be linked to occasional office upgrades rather than regular generation.	No classification within the NSW Waste Classification Guidelines as this waste should not be disposed to landfill.	Stored separated and collected for recycling. Collection arranged as necessary.
Paints, solvents, waste oils, chemicals and related packaging, defective mechanical and electrical components	Building fit-out and ongoing maintenance during operations	Construction and operation	Not quantified, as generation will be linked to ad hoc site activities and maintenance rather than regular procedures. Provisions in the WMP will prevent environmental risk.	Liquid waste Empty containers which held these products: general solid waste (non-putrescible) – pre-classified. General solid waste (non-putrescible) – pre-classified	Stored separately onsite in line with the WMP and transported off site for disposal or recycling. Collection arranged as necessary.
Green waste	Maintenance of the green roof and green walls	Operation	Not quantified, as generation will be linked to the flora species chosen during detailed design.	General solid waste (non-putrescible) – pre-classified	Removal by maintenance personnel for composting or disposal at licensed facilities.

10.4 Mitigation

Table 10.3 describes the measures that would be applied to avoid, minimise or mitigate the potential impacts associated with the waste generated as a result of the proposal. More detailed provisions for waste management and resource recovery will be covered in the CEMP and WMP.

Table 10.3: Summary of potential impacts and proposed mitigations for construction and operational waste

ID	Potential impact	Proposed mitigation
Construction mitigation measures		
W1	Health risks arising from handling or contact with ACM.	ACM contaminated soil will be identified and remediated in line with the RAP.
W2	Health risks arising from handling or contact with contaminated soil and hazardous waste materials.	Existing buildings and potentially contaminated soil within building footprints will be assessed and remediated as per the RAP.
W3	Waste of recyclable resources through unnecessary disposal to landfill.	Waste will be managed in line with the waste hierarchy. The CEMP will include provisions for segregation and separate collection of recoverable materials, including green waste, excavated natural materials and metals.
W4	Pollution of land or waterways including groundwater through accidental escape of waste or runoff.	The CEMP will include measures for containment of waste during storage and transport, such as covering, fencing and bunding.
W5	Spread of weeds, pests or pathogens within recovered waste materials.	A weed management plan will be developed, outlining appropriate control and disposal options of high threat weeds identified on site.
W6	Pollution of land or waterways through disposal of waste to an inappropriate site.	The CEMP will include a requirement that all waste be delivered to an appropriately licensed facility for recovery or disposal.
Operation mitigation measures		
W7	Waste of recyclable resources through unnecessary disposal to landfill or energy recovery	Waste will be managed in line with the waste hierarchy. A WMP will be developed and will include provision for source separation systems for recyclable materials, including food waste, paper and card and comingled recyclables. No operational waste will be disposed directly to the tipping hall for energy recovery.
W8	Loss of amenity for workers, visitors or neighbours due to odour and vermin	A WMP will be developed during detailed design for the adequate provision for storage and collection of waste.
	Escape of litter causing • Pollution of land and waterways • Harm to wildlife • Loss of amenity to neighbouring properties.	
W9	Pollution of land or waterways through disposal of waste to an inappropriate site.	The WMP will include a requirement that all waste be delivered to an appropriately licensed facility for recovery or disposal.

Chapter 11

Soils and water

11 Soils and water

11.1 Introduction

This chapter summarises the potential impacts to soils and groundwater, including potential contamination impacts, associated with the construction and operation of the proposal. This chapter does not assess surface water (other than the interactions between groundwater and surface water) and flooding impacts, which are summarised in **Chapter 12 Hydrology and flooding.** Nor does it assess aquatic biodiversity impacts – they are summarised in **Chapter 21 Biodiversity**.

A Soils and Water Assessment Report has been prepared and included as **Technical report F**. Geotechnical and contamination investigations have also been carried out, including:

- Detailed site (contamination) investigation (Technical report G)
- Factual Geotechnical Investigation Report (Technical report G1)
- Remediation Action Plan (RAP) (Technical report G2).

The methodology for the soils and water assessment involved:

- A review from public sources of information and spatial data sets to determine the existing conditions for soil, geology, topography, groundwater and contamination
- A review of the onsite geotechnical and contamination investigations to assess contamination on the site
- An assessment of the proposal's impacts on groundwater and development of mitigation measures.

The methodology for the DSI involved:

- A desktop review of readily available site history information
- Intrusive investigations, including boreholes, test pits and the installation of groundwater and gas wells
- Laboratory analysis of contaminants
- An assessment of potential contamination pathways using a conceptual site model.

11.2 Existing environment

The existing environment conditions relevant to the soils and water assessment were determined by reviewing publicly available sources of information and completing site investigations.

11.2.1 Land use

The site has an industrial and agricultural history, having previously been used for poultry production. Site features include large poultry sheds, multiple workshops and storage buildings, and an at-grade car park at the south-eastern boundary. There is an overland flow path channel along the eastern boundary of the site, which flows towards a farm dam near the eastern boundary. The site has been subject to a history of cut and fill and has different ground levels across the site.

The nearest residential area is about 1km to the south of the site in Horsley Park, with the Minchinbury residential area located around 3km to the north-west. Horsley Park Public School is over 2km south of the site and a childcare centre is within the Eastern Creek industrial area, about 1km to the west of the site.

The site is bounded by the Westlink M7 Motorway to the west, with the Eastern Creek industrial area located farther west. The SUEZ Eastern Creek Waste Management Centre comprising the now-closed landfill site and operational organics recycling facility is located to the north and north-east, with the operational Global Renewables waste management facility located immediately to the east. To the south, the site is bounded by the Warragamba Pipeline Corridor, with the Austral Bricks facility located farther south.

11.2.2 Topography

The site is moderately sloping from about 62m above height datum (AHD) at the south-western corner to 52m AHD along the north-eastern boundary.

11.2.3 Soils and geology

The site is underlain by Bringelly Shale of the Wianamatta Group. The Bringelly Shale is anticipated to be over 100m thick in this area and is overlain locally by Quaternary Deposits of various types and artificial fill.

Site investigations carried out have confirmed the following site conditions:

- The fill on the site is likely to consist predominantly of silty clay and clay. The presence of debris in the fill mix indicates that it is likely to have been placed in an uncontrolled manner. Reviewing historic imagery, it is likely that the fill was placed between 1986 and 2004.

  Although fill is present across much of the site, there are two main fill zones on the site that contain plastic, brick, concrete fragments and charcoal. These areas are located in the south-east portion of the proposal site and adjacent to the farm dam in the central east portion of the proposal site. The fill depth varies from 1.2m up to 5.7m.
- The proposal site has deposits of quaternary floodplain alluvium of soft consistency. These deposits, predominantly clay, are overlaying the residual soils in the north-east corner of the site with red-brown colouration.
- Residual soils with depths up to 2m below ground level are observed over most of the proposal site, particularly in the locations where fill and alluvial soils are present. The residual soil is typically grey mottled orange in colouration and is predominantly formed by a clay material with a firm to stiff consistency and medium plasticity.
- The bedrock level in the area is 3 to 6m deep. Igneous rock bodies occur in the vicinity of the proposal site, the largest being Prospect Picrite. Although not being mapped, it is possible that basaltic sheet-like rock bodies formed in the fracture of the existing igneous bodies, known as dykes, may be present beneath the site area.
- There are no mapped geological structural features or lineaments affecting the site. The only adjacent geological structure is 1km to the west of the site, which seems to be isolated. The Penrith Basin Syncline runs north west to south east and is mapped 2.8km to the north of the proposal site.
  This confirms that the bedrock dips to the north east.

A review of the NSW Acid Sulfate Soil Risk Map shows that the site is not mapped in an area likely to have ASS. However, testing has shown that there could be potential ASS.

11.2.4 Groundwater and groundwater users

Onsite investigations showed that groundwater depth across the site ranges from 0.1m below ground level at the eastern boundary to 5.7m below ground level at the southern boundary, 47.5m above height datum (AHD) to 55.3m AHD.

Permeability tests indicate very low permeabilities onsite, with limited potential for groundwater flow to be transmitted through the rock mass.

A search of registered groundwater bores confirmed that there are no known groundwater users within the proposal site. There are eight registered groundwater bores recognised within 3km of the proposal site. These bores are used as monitoring wells, and none are known as drinking water sources.

The nearest surface water receptors to groundwater are Reedy Creek, located 450m to the north west of the site, and Eastern Creek, located around 800m to the east of the site. Prospect Reservoir is located 2km to the east of the proposal site.

Although the National Groundwater Dependent Ecosystem (GDE) Atlas (BAP 2016) shows potential GDE mapped on the site, field surveys indicated that these features comprise exotic grassland only and that there are no GDEs on the proposal site (refer to **Technical report Q Biodiversity Development Assessment Report**).

11.2.5 Existing contamination at the proposal site

11.2.5.1 Desk top review

A desktop review of the proposal site history and site investigations in 2015, 2019 and 2020 has been carried out. This is reported in the due diligence investigations **(Technical report G3)** and a DSI **(Technical report G).**

The 2015 and 2019 investigations comprised drilling of 40 boreholes, 7 of which were converted into combined soil, gas and groundwater monitoring wells. An additional 17 surface samples targeting locations near and within buildings and 6 surface water samples from standing water bodies at the site were taken.

Additional testing as a part of the DSI in 2020 comprised the drilling of four additional boreholes, which were converted into groundwater wells and the excavation of 15 test pits.

The testing locations are shown on **Figure 11.1** below.

Figure 11.1: Testing locations

11.2.5.2 Soil testing results

Section 8.1 of the DSI (**Technical report G**) explains the site assessment criteria (SAC) for assessing the contamination of soils. The health investigation levels (HIL) and health screening levels (HSL) are scientifically based, generic assessment criteria designed to be used to assess the potential human health risk from chronic exposure to contaminants. Ecological investigation levels (EIL) and ecological screening limits (ESL) have been derived for selected metals and organic compounds and are applicable for assessing risk to terrestrial ecosystems.

The soil testing indicated no results above the adopted health-based investigation criteria, except for lead at one location and asbestos in soil within an elevated fill platform in the south east of the site.

Lead levels of 3,700mg/kg were found in a 2019 sample (S12) (**Figure 11.2**). This represents an exceedance of 2,200mg/kg above the NEPC (2013) standard of 1,500mg/kg. This exceedance was associated with high levels of lead contained in paint samples from the nearby buildings and is not considered to be representative of the soils across the site.

The soil testing also indicated exceedances of ecological based criteria for copper, zinc, benzo(a)pyrene and total recoverable hydrocarbons (TRH) in soils but did not exceed the HIL. Using statistical software, the exceedances of EIL are not considered statistically significant.

Potential asbestos containing material (ACM) was observed in 11 samples at eight locations, primarily associated with the raised fill platform and surrounding areas in the southern section of the site. **Table 11.1** summaries the asbestos HSL exceedances. The HSL for bonded ACM is 0.05% w/w (weight for weight), and for fibrous asbestos (FA) and asbestos fines (AF) the HSL is 0.001% w/w.
The testing locations which had elevated asbestos are shown in **Figure 11.2**

Table 11.1: Summary of asbestos HSL exceedances

Sample	Level of asbestos (% w/w)		
	No visible surface asbestos	Bonded ACM	FA and AF
TP03/0–0.4	Detection in near surface soils	<0.05	<0.001
TP04/A1 / TP04/0–0/4		<0.05	<0.001
TP10/0–0.5 / TP10/A1		0.084	<0.001
TP14/A1 (TP14/0–0.2)		0.056	-

Service Layer Credits: © Department of Customer Service 2020 DFSI 2020

© Arup 2020

Figure 11.2: Identified contamination at the proposal site

11.2.5.3 Groundwater and surface water results

Groundwater and surface water testing was carried out in 2019 and 2020. The samples collected as part of the 2019 investigation were compared to the Australian and New Zealand Environment and Conservation Council (ANZECC) Fresh Water Guidelines 2000. These standards have since been superseded, and the most recent water quality samples collected as part of the 2020 investigation were compared to the Australia New Zealand Guidelines (ANZG) for Fresh and Marine Water Quality 2018.

The results from the testing of groundwater and surface water samples indicated exceedances against the site assessment criteria. The results are shown in **Table 11.2** and **Table 11.3**.

These exceedances are indicative of regional groundwater quality, rather than an onsite or offsite contamination source.

Table 11.2: Summary of exceedance of ANZECC standards detected in groundwater and surface water samples taken in 2019.

Parameter	ANZECC standard (mg/l)	Sample type	Sample	Range of values which exceed the standard (mg/l)
Ammonia	0.9	Groundwater	BH201, BH204	1.3 to 1.7
		Surface water	SW01	1.1
Cadmium	0.0002	Groundwater	BH201	0.0004
Copper	0.0014	Groundwater	BH201, BH208, BH213, BH2, BH4	0.002 to 0.009
		Surface water	SW01, SW02, SW03, SW04, SW05, SW06	0.002 to 0.011
Lead	0.0034	Surface water	SW02, SW03, SW05	0.004 to 0.006
Zinc	0.008	Groundwater	BH201, BH208, BH213, BH4	0.012 to 0.0.59
		Surface water	SW01, SW02, SW03, SW04, SW05, SW06	0.012 to 1.5

Table 11.3: Summary of exceedances of ANZG (2018) detected in groundwater and surface water samples taken in 2020.

Parameter	ANZG standard (mg/l)	Sample type	Sample	Range of values which exceed the standard (mg/l)
Ammonia	0.9	Groundwater	ABH02, BH204	1.4 to 4.1
Total chromium	0.0045	Groundwater	ABH02, BH204	0.004 to 0.005
Copper	0.0014	Groundwater	ABH01, ABH02, BH2, BH201, BH204, BH208, BH213	0.002 to 0.016
		Surface water	SW01, SW02, SW03, SW04, SW05, SW06	0.002 to 0.056
Manganese	1.9	Groundwater	ABH03, BH4, BH213	2.1 to 17
		Surface water	SW03, SW04	1.9 to 3.6
Zinc	0.13	Surface water	SW06	1.5

11.2.5.4 Gas testing results

Landfill gas monitoring results indicated zero to low gas flow rates produced from the monitoring wells in addition to low measured levels of landfill gases. Soil vapour samples collected also indicated minor detectable concentrations all below site assessment criteria for contaminants. Given the low test results in groundwater and the groundwater flow direction, it is unlikely that these concentrations are attributable to the nearby waste facilities to the east and north.

11.2.5.5 Summary of contamination results

The DSI concludes that the proposal site is considered to have a low water and vapour contamination risk and a low to moderate risk for soil contamination, primarily in the form of soil asbestos.

11.2.5.6 Salmonella

The proposal site history indicates that the site has been used for mixed-use commercial and industrial activities, including a poultry factory farm in the 1970s. A Biosecurity Direction dated 24 January was given to the previous site owner 2019 from the Department of Primary Industries (DPI) about the presence of Salmonella onsite. The current site owners worked with DPI to resolve the Salmonella problem following current procedures. The applicant has since received a letter from DPI dated 26 May 2020 which confirmed the site is now considered a ‘resolved premise’ and the Biosecurity Direction has been revoked.

11.3 Assessment

The following section summarises the potential impacts on soil and groundwater in construction and operation of the proposal. Potential impacts in construction include erosion and sediment impacts, contamination impacts and impacts to the quality and quantity of groundwater flow. The assessment considers any impacts to groundwater quality, flow and recharge in operation of the proposal. **Chapter 10 Waste management** provides further detail on how excavation and demolition waste will be managed onsite.

11.3.1 Construction impacts

11.3.1.1 Erosion and sediment impacts

As described in **Chapter 3 Proposal description**, the construction of the proposal will include some soil disturbance activities including:

- Clearing of land and vegetation removal
- Excavation and trenching
- Internal road works
- Stockpiling.

The management for the disposal or reuse of excavated soil has been assessed in **Chapter 10 Waste management**.

These construction activities have the potential to increase the erosion of soil on the site and generate sediment laden runoff which in turn has the potential to impact the surrounding environment, including Reedy Creek, Eastern Creek and the related aquatic communities. The overall site erosion hazard is high, given the presence of dispersive soils and soil characteristics which exhibit high erodibility. These soil characteristics will need to be considered as part of the Construction Environmental Management Plan (CEMP).

A preliminary Sediment and Erosion Control Plan has been prepared for this proposal and is included in Appendix B of **Technical report H Hydrology and Flooding Assessment Report**. Strategies outlined in the preliminary plan include:

- Shaker pads at construction access points
- Sediment fences
- Sediment basins
- Cut-off drains
- Check dams.

An updated Sediment and Erosion Control Plan will be prepared as part of the CEMP before construction starts and will include a detailed description of the overall approach and site-specific erosion and sediment control measures, including:

- Proposed phasing of works
- Location of shaker pads and construction access points
- Location of sediment fences
- Size and location of cut-off drains and check dams
- Size and location of sediment basins, including any interim basins
- Location of stormwater discharge points and where applicable, pump rates from sedimentation basins
- Proposed groundwater management strategies, in particular for building bunker excavation
- Proposed water quality and quantity monitoring strategies during construction
- Details of a proposed strategy for post-construction rehabilitation of the site.

11.3.1.2 Acid sulfate soils

The site is not mapped in an area likely to have ASS. However, testing has shown that there could be potential ASS. Regular testing and characterisation of soils in areas of potential disturbance will be carried out to quantify sulphides and the measures needed to mitigate risk of ASS production. Mitigation measures will be included as part of spoil management in the overarching CEMP, or if considered to be a medium to high risk, an ASS management sub-plan may be required as part of the CEMP.

11.3.1.3 Contamination impacts

The DSI (**Technical report G**) found existing contaminants onsite as outlined in the existing environment in **Section 11.2.** Construction activities, including the demolition of buildings and the excavation of soil, have the potential to mobilise these contaminants.

Mobilised contaminants can impact nearby human and environmental receptors via the following potential contamination pathways:

- Ingestion and dermal contact
- Inhalation of dust and or vapours
- Surface water runoff
- Leaching of contaminants and vertical migration into groundwater
- Lateral migration of groundwater providing base flow to water bodies
- Direct contact with ecological receptors.

Asbestos

The site testing and investigations confirmed that many of the existing buildings onsite contain confirmed or potential asbestos containing materials. Following demolition, the soils surrounding these buildings can become contaminated with asbestos. A detailed hazardous building materials survey and appropriate removal of these materials will be conducted before demolition according to appropriate standards and regulations. Where asbestos contamination is known to be present, mitigation measures such as the use of appropriate protective equipment will be used for construction workers. A procedure for the management of known and potential contamination is outlined in the Remediation Action Plan (RAP) as **Technical report G2**.

Once the RAP is applied, the procedures will render the site suitable for the proposed construction and eliminate any ongoing risk of asbestos contamination.

Gas

Soil gas field readings and laboratory results suggest that migrating gases from adjoining sites are not likely to present a hazardous risk to the proposal.
The relatively impermeable sub-surface profile of clay and shale provides an effective buffer to soil gas migration, should such gases be generated from neighbouring sites. Additional soil gas monitoring will be carried out as part of the RAP.

11.3.1.4 Groundwater impacts

The geotechnical and hydrogeological site investigation encountered a shallow groundwater table at 0.1m to 5.7m below ground level (BGL). As the investigation only reached a maximum depth of 25m BGL at the site with bores screened to a depth of 15m BGL, further understanding of groundwater systems at depth are largely unknown. Nevertheless, given that the bunker will only reach at maximum depth of 15m BGL, only the shallow groundwater system encountered in the investigation will likely be impacted.

An analysis of groundwater drawdown was modelled for a 90-day period after excavation of the bunker. The model shows that drawdown will occur locally at the excavation and reduce to 0.1m drawdown 120m away from the excavation, at which, impacts associated with drawdown are considered negligible. Given that the waste bunker will be excavated at least 200m from the nearest site boundary, impacts associated with groundwater drawdown beyond the site are considered negligible.

Potential mobilisation of contaminants

The potential for mobilisation of contaminants as a result of groundwater drawdown is limited, due to the low permeability of the shales and overlying clay deposits. As a precaution, the groundwater will be monitored and tested in construction.

Impacts on nearby surface watercourses

Any alteration to groundwater conditions or quality due to the construction activities are not expected to impact nearby surface watercourses such as Reedy Creek, Eastern Creek and Prospect Reservoir.

Calculations have been carried out to determine the time taken for groundwater flow to reach Reedy Creek. Even in highly favourable water flow conditions, which do not exist at the site, it has been estimated that it would take at least 75,000 years for contaminants in groundwater to reach the closest downgradient watercourse, Reedy Creek.

Given Prospect Reservoir is upgradient of the site, there will be no groundwater flow from the proposal site

Impacts on nearby groundwater users

There are eight groundwater monitoring wells recognised within 3km of the proposal site. There will be no impact on these wells given that they are either upgradient from the site or are located sufficiently far away from the site.

Management of groundwater

Groundwater will be pumped from the excavation areas in construction. This groundwater will be stored onsite and tested. If suitable, the groundwater will be reused onsite where needed. If not suitable for reuse, the water will be taken offsite for disposal to a licenced facility. The details of water management in construction will be included in the CEMP.

11.3.2 Operation impacts

11.3.2.1 Impacts to groundwater quality

Surface water and stormwater is intrinsically linked to groundwater. Stormwater runoff can result in impacts to groundwater quality if not managed appropriately. The low permeability of the underlying geology means that there is limited potential for surface contamination to reach groundwater. The proposal will be serviced with enough sewer and stormwater infrastructure as outlined in **Chapter 12 Hydrology and flooding**, and any impacts to groundwater quality from surface runoff will be avoided.

The proposal will include the use and storage of hazardous materials. These are assessed in **Chapter 14 Hazard and risk**. Based on this assessment, all hazardous materials can be managed appropriately to avoid any spills or leaks. The risk of hazardous materials impacting stormwater runoff and groundwater quality is considered low.

11.3.2.2 Groundwater flow and recharge of shallow groundwater

The proposal is designed to be built in the southern area of the site, over predominantly existing hardstand areas. Any additional impermeable surface will be limited. There are unlikely to be any impacts to groundwater recharge as a result of reduced permeable surface on the site.

The proposed waste bunker will be impermeable and will divert shallow groundwater flow (if any) around the outside extents of the bunker. Given that the groundwater is shallow and variable across the site, it is unlikely that this will have any material impact. There are no groundwater users near the site which would be impacted. Overall, the impacts on groundwater flow from the waste bunker are negligible.

11.4 Mitigation

The proposed measures to mitigate, manage and monitor soils and water impacts are outlined in **Table 11.4.**

Table 11.4:Soils and water mitigation measures

ID	Impact	Mitigation
Design embedded mitigation measures		
SW1	Contamination risk to groundwater and soils	All waste storage and the waste bunker will be designed to avoid leaching of any contaminants into the groundwater or soils.
Construction mitigation measures		
SW2	Erosion and sedimentation	As part of the CEMP, an Erosion and Sediment Control Plan (ESCP) will be prepared and applied, outlining measures for the prevention of erosion and sedimentation in construction.
SW3	Erosion and sedimentation	Sediment basins in the ESCP would be designed to account for dispersive soils. Visual observation would be maintained in excavation for evidence of high-salinity soils (visible salt crystals and other evidence), and if found, these would be removed and placed in covered stockpiles.
SW4	Contaminated soils	Where relevant, contaminated surface soils and fill material will be stripped, waste classified and disposed offsite at a licensed facility, as per NSW EPA Waste Classification Guidelines.
SW5	Acid sulfate soils	Regular testing and characterisation of the ground in areas of potential disturbance would be carried out to quantify sulphides and the neutralisation required to mitigate the risk of acid sulfate soil production.
SW6	Contamination risk	A draft Remediation Action Plan (RAP) has been prepared and will be applied to render the site suitable for the proposal. The RAP will include: • Hazardous building materials survey • Removal of all hazardous building materials • A continued soil and soil gas monitoring
SW7	Impact on groundwater quality	Encountered groundwater will be monitored regularly throughout the construction period. Monitoring would assess any changes to background groundwater quality conditions from those previously recorded, to recognise contaminant level trends and any groundwater impacts.
SW8	Impact on surface water quality	A surface water monitoring program will be applied to demonstrate the effectiveness of erosion control and sediment control measures and help with construction site management.
Operation mitigation measures		
SW9	Impact on groundwater quality	Given the proximity of the site to landfill, ongoing monitoring of groundwater quality will be carried out.

Chapter 12

Hydrology and flooding

12 Hydrology and flooding

12.1 Introduction

This chapter summarises the existing hydrological conditions, including the risk of flooding across the study area and the potential impacts associated with construction and operation of the proposal. Hydrology is the study of the occurrence of water, its properties, its distribution and circulation, and its effects on the surrounding environment. The scope of this assessment includes a description of the existing surface water features and conditions on the site, stormwater quality and management, a water balance which categorises areas of stormwater collection, storage and reuse, and a flood impact assessment.

A Hydrology and Flooding Assessment Report was prepared and is included as **Technical report H.**

A Soils and Water Assessment Report (**Technical report F**) was also prepared for this EIS. That report assesses the potential impacts to soils and groundwater, including potential contamination impacts associated with the construction and operation of the proposal. Aquatic ecology is assessed in the Biodiversity Development Assessment Report (BDAR) included as **Technical report Q.**

The methodology for the hydrology and flooding assessment involved:

- Setting up the study area, including the site, upstream and downstream catchments
- Reviewing topographical survey data and flood data for the site and upstream catchment area
- Reviewing water quality monitoring records for Reedy Creek (downstream of the proposal site)
- Reviewing site investigation results for surface water quality sampling from the onsite farm dam and overland flow path
- Using MUSIC modelling software to assess the effectiveness of water quality management measures
- Completing a flood impact assessment
- Completing a site water balance assessment
- Consulting with WaterNSW and Blacktown City Council (BCC).

12.2 Existing environment

12.2.1 Stormwater drainage and catchment

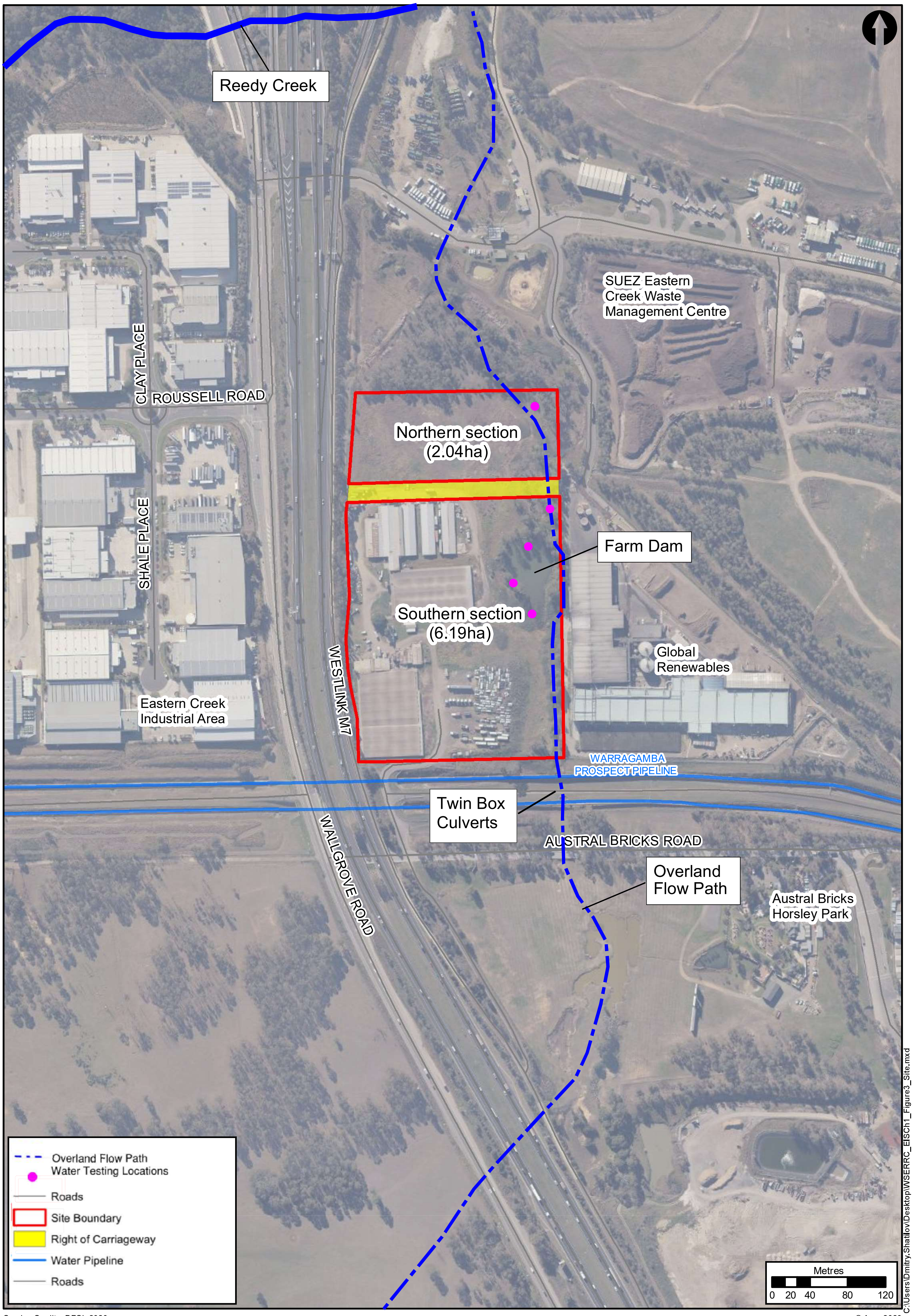
The site is bounded by the Westlink M7 Motorway to the west, with the Eastern Creek industrial area located farther west. The SUEZ Eastern Creek Waste Management Centre, comprising the now-closed landfill site and operational organics recycling facility, is located to the north and north-east. The operational Global Renewables waste management facility is located immediately to the east. To the south, the site is bounded by the Warragamba Pipeline Corridor, with the Austral Bricks facility located farther south.

The site is located within the Hawkesbury Nepean Catchment area. The internal catchment for the proposal site generally drains from south to north and west to east. The site is sloping from the south-west (highest point) to the north eastern area of the site where the farm dam is situated. A stormwater overland flow path enters the site via twin culverts to the south and passes through the site along the eastern boundary to the north which eventually discharges to Reedy Creek about 450m north west of the site (as shown in **Figure 12.1**) A review of aerial photography and topographical data found that the overland flow path drains to the proposal site via an upstream catchment area of about $1.2km^2$.

A site inspection was also carried out which indicated that the overland flow path is separate from the farm dam. However, mixing of flows may still occur during major storm events. From the farm dam spillway, the densely vegetated overland flow channel conveys flows northwards then north-west, eventually flowing into Reedy Creek.

A separate open stormwater drain is located within the M7 WestLink Motorway property boundary which collects and conveys stormwater from the section of the M7 WestLink Motorway adjacent to the proposal site. This drain has been designed such that stormwater does not discharge to the proposal site. Small areas of hard standing adjacent to the western boundary, comprising about 5% of the site, are graded to the west, conveying overland flows into the open drain serving the M7 Westlink Motorway. This open drain flows north and discharges into Reedy Creek.

There is minimal piped stormwater drainage within the site, with building downpipes discharging to the adjacent surface.



Service Credits: DFSI, 2020

12.1: Existing stormwater features and site water quality test locations

12.2.2 Water quality

BCC monitored water quality during a six-month testing period, from 2008 to 2009, on Reedy Creek 450m north-west (downstream) of the proposal site. The samples were tested against the Australian and New Zealand Environment and Conservation Council (ANZECC) water quality guidelines. The results indicated relatively poor water quality with values outside of the ANZECC water quality guidelines for each test.

As part of the detailed site investigation (DSI) for this EIS (included in **Technical report G**), water quality was tested focussing on the overland flow path and farm dam. **Figure 12.1** shows test locations. The results indicated high nutrient content in the water, with dissolved oxygen and total phosphorus falling outside of the ANZECC water quality guidelines range for all samples taken (see **Table 12.1**). High-nutrient contents could come from agricultural or industrial activities in the upstream catchment area draining to the site.

Table 12.1: Site water quality test results.

Sample	Date	Electrical conductivity (mS/cm)	Dissolved oxygen (% saturation)^	pH	Total phosphorus (mg/L)
ANZECC water quality guideline trigger value^		**0.125–2.2**	**85–110**	**6.5–8.0**	**0.025**
SW01	28-02-20	0.98	79	7.9	0.2
SW02	28-02-20	0.42	77	7.5	0.4
SW03	28-02-20	1.2	77	7.8	0.2
SW04	28-02-20	0.42	73	7.6	0.3
SW05	28-02-20	0.46	80	7.4	0.4

^Dissolved oxygen % saturation values calculated based on sample results and an estimated temperature of 20°C.

12.2.3 Flooding

Flood mapping on the BCC GIS MapsOnline portal shows that the proposal site is not within the flood plain of Reedy Creek or Eastern Creek. The site-specific flood investigation carried out as part of the Flood Impact Assessment (see Appendix A of **Technical report H Hydrology and Flooding Assessment**), concluded that the overland flow path that runs along the eastern boundary of the site experiences some flooding. In all modelled events, flooding is shown to mix between the overland flow path and the farm dam at the proposal site. Flooding is also shown to be present at the Global Renewables Limited (GRL) site to the east.

BCC is also conducting a flood investigation for Eastern Creek, including the Reedy Creek floodplain. In response to a request for flood information at the site, on 20 April 2020 BCC sent preliminary flood maps for the 1% annual exceedance probability (AEP) and Probable Maximum Flood (PMF) events from this investigation. It showed flooding along the overland flow path which incorporated the farm dam.

12.2.4 Riparian corridor

Based on the NSW Office of Water Guidelines for Riparian Corridors on Waterfront Land, NSW Map data (SixMaps) and the Strahler System for classifying streams, the overland flow path through the site is not a defined water course and the preservation of a riparian corridor at the site was not considered necessary. It is noted however, that the Biodiversity Development Assessment Report (BDAR), included as **Technical report Q**, does classify the overland flow path as an unmapped first ordered stream, in line with the Strahler stream classification (DoI, 2018). Although no watercourses are mapped for the proposal site, an overland flow path exists within low-lying areas adjacent to the eastern property boundary. This overland flow path is referred to as a stream in the BDAR.

Based on the Strahler System classification, both Reedy Creek and Eastern Creek would be defined as third-order watercourses. The riparian corridors associated with these creeks are at least 450m from the proposal site and are not impacted by the proposal.

12.3 Assessment

The construction and operation of the proposal has the potential to impact on the existing hydrology and flooding environment through the construction of new surfaces which change the way water moves through the site and the contamination of stormwater. The following sections assess these potential impacts.

12.3.1 Construction impacts

12.3.1.1 Water quality

Water quality can be impacted during construction works from sediment and erosion impacts and dewatering of sedimentation basins.

Careful planning during construction regarding clearing, excavation, stockpiling, and filling works will be necessary to effectively manage impacts from site runoff and will be managed as part of a Construction Environmental Management Plan (CEMP) for the site.

A preliminary sediment and erosion control plan has been prepared for this proposal and is included in Appendix B of **Technical report H**. A detailed Soil and Water Management Plan, including updated sediment and erosion controls, would be developed for construction, with reference to relevant guidelines, in particular, Managing Urban Stormwater Soils and Construction Volume 1 (Landcom, 2004). The contractor will be responsible for monitoring the quality of stormwater discharged from the site construction area via sedimentation basins. Water quality in the overland flow path, including at the site discharge point, will also be monitored regularly throughout construction. The exact quality of construction stormwater is unknown. These uncertainties will be resolved through testing of the stormwater in the detention basins and implementation of appropriate disposal or reuse methods through the management plans.

The existing farm dam on the site will be decommissioned during construction, which involves dewatering of the dam into the existing environment. This process can result in the discharge of suspended solids into the receiving environment with the potential to impact on the quality of surface water. This will be managed through the preparation of a Dewatering Management Plan as part of the CEMP and overall construction planning, which would be used to determine the dewatering method, monitoring, and what actions would be taken in response to the construction surface water quality monitoring program. The management plan would include:

- Implementation of the construction surface water quality monitoring program to manage and limit the discharge of suspended solids into the receiving environment
- Identification of discharge points for stored water and sediments. Where possible stored water will be spread across the site and used for dust suppression
- Sampling of sediment samples to determine the associated contamination risk. If contaminants are identified, remediation strategies will be defined to minimise impacts on the receiving environment
- Control measures to follow during dewatering to release/rehome native aquatic fauna and remove of potential exotic fauna.

Impacts to aquatic fauna from dewatering of the farm dam are discussed in **Chapter 21 Biodiversity**.

Erosion and sediment control measures for the overland flow path realignment would be finalised by the appointed contractor, and would likely include:

- Timing of works to avoid wet periods
- Installation of temporary rock check dams in the realigned flow path and downstream
- Bank stabilisation with geofabric materials
- Placement of sediment fencing downstream of works boundary
- Planting of vegetation as early as possible and attention to promote establishment.

12.3.1.2 Flooding

The creation of temporary drainage onsite will be important to safely manage site stormwater runoff and minimise the risk of flooding during construction.

All construction compounds and main construction access tracks would be located outside of the existing 1% AEP flood extent areas recognised in the existing conditions flood risk assessment for the proposal (refer to Appendix A of **Technical report H**).

12.3.1.3 Water demand

A preliminary assessment of the likely water demand during the construction phase has been completed. Construction and application of the proposed facility is anticipated to extend over 3 ¼ years (39 months).

Major water usage on site arises from:

- Construction staff (potable water)
- Construction staff (non-potable water)
- Water to support earthworks and road construction, including dust control and embankment conditioning
- Washdown of concrete trucks, trucks and other plant before leaving site
- Miscellaneous usage.

The average monthly water use is estimated to be 630m^3, with a maximum of 1,240m^3 and minimum of 30m^3. The total expected water demand for construction is about 22,500m^3 (22.5ML).

It is anticipated that the existing WaterNSW water connection would be used during early stages of construction until the permanent Sydney Water connection has been installed. Water collected in sediment basins could be reused for dust suppression on the construction site.

12.3.2 Operation impacts

12.3.2.1 Stormwater quality and management

To assess the water quality performance of the stormwater management strategy for the proposal, MUSIC modelling software has been used. MUSIC can be used to determine if proposed changes to land use can meet mandated water quality objectives[1]. The proposed water quality treatment devices for the proposal include gross pollutant traps, a bioretention and onsite detention (OSD) basin and the revegetation of the overland flow path. These water-sensitive urban design elements will enable the proposal to meet BCC pollutant reduction targets. Indicative locations of the stormwater management features are shown in **Figure 12.2**.

[1] CRC, 2002.

Figure 12.2: Stormwater management features

The MUSIC model for the site was developed based on fixed rainfall and evapotranspiration data for the BCC area and breaking the site into sub-catchments based on land use and site grading.

MUSIC modelling results were compared with BCC stormwater pollutant reduction targets and demonstrated compliance with these targets. The discharge from the proposed OSD basin in the north-east of the site will be monitored with permanent water quality monitoring devices. OSD basins serve as temporary storage for stormwater runoff, which means the runoff rate and volume can be controlled so that the receiving system is not overloaded during storm events. The water quality monitoring devices can be used to determine when maintenance will be needed. A summary of stormwater maintenance tasks can be found in **Technical report H**. Site runoff through each trunk drain will also pass through a gross pollutant trap before discharge to the basin.

A modified MUSIC model has also been used to calculate the Stream Erosion Index (SEI) to confirm compliance with BCC requirements. The stream erosion index suggests the potential for a development to cause erosion of the downstream waterway. The results found the SEI for the site to be acceptable.

To formalise the overland flow path through the site, the existing flow path will be realigned to run along the eastern boundary from south to north. To mitigate flooding impacts to the neighbouring GRL site, the short section of the overland flow path that passes into the GRL site will be removed and retained within the proposal site. Realignment will be completed early in the construction program, to reduce flood risk at the site during construction.

The overland flow path will be designed to match the capacity of the existing overland flow path through the site and kept separate from site stormwater runoff. Improvements will be made to the overland flow path through revegetation with planting of suitable native vegetation (in line with the Vegetation Management Plan) and development of a low-flow design to distribute water quality benefits to downstream watercourses. An indicative cross-section of the overland flow path is shown in **Figure 12.3**.

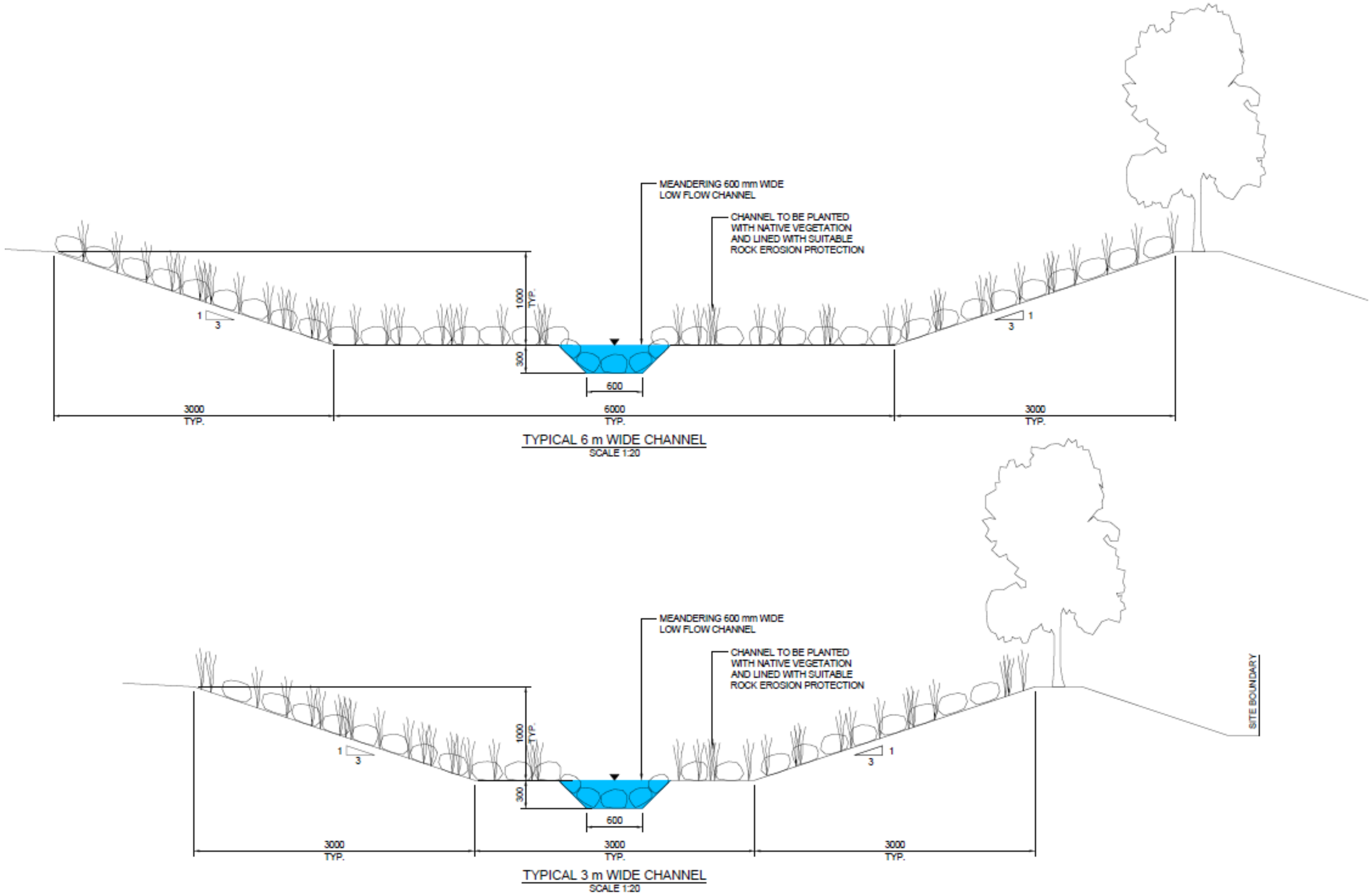


Figure 12.3: Cross-section of proposed overland flow channel (indicative and subject to detailed design)

Two interconnected basins are proposed to manage site stormwater runoff, to be located at the north-east area of the southern part of the proposal site. The site stormwater runoff will be conveyed to these basins via the site drainage network. This will include overflow from the two 100kL rainwater tanks when they are full.

The western portion of the basin will act as a bioretention water quality basin which is landscaped depressions or shallow basins used to slow and treat onsite stormwater runoff. The eastern portion will act as an OSD basin and include an outlet structure and emergency overflow spillway. Site stormwater runoff will be discharged from the OSD basin to the overland flow path.

During large rainfall events, stormwater from hardstand areas and roofs will drain to these basins, to avoid both offsite runoff and operation impacts. The pipe network will be designed for the 5% AEP critical storm event, with the major stormwater network incorporating kerbs, gutters and surface drains designed for the 1% AEP event.

Impacts related to runoff from sensitive areas such as ammonia tanks, diesel refuelling area and electrical substation, where there is a risk of spills of chemicals or hydrocarbons, will be bunded to prevent an overflow outside the proposal site. These areas will be regularly inspected, monitored and maintained. It is also recommended that sensitive areas have oil and water separators installed, including shut-off valves.

12.3.2.2 Flooding

A flood impact assessment has been completed to assess potential flooding impacts both on the proposal site and on offsite properties as a result of the proposal. A hydraulic model (TUFLOW) was developed to assess stormwater flow and flood conditions to inform the design of the realigned overland flow path and other site earthworks, and to mitigate any increases in flood risk at neighbouring sites.

Flood risk is expressed as an Annual Exceedance Probability (AEP) which refers to the probability of a flood event occurring in any year. The probability is expressed as a percentage with a large flood which may be calculated to have a 1% chance to occur in any one year, described as 1% AEP. The flood risk assessment considered the 5% AEP, 1% AEP and a worst-case 1% AEP climate change scenario.

The flood assessment assessed both on- and offsite impacts, as a result of the proposal under each of these scenarios. It also assessed the Probable Maximum Flood (PMF) event which is only considered in the context of developing emergency safety evacuation measures in response to an extreme flood, rather than assessing offsite impacts.

Flood modelling has demonstrated that the overland flow path and proposed changes to the site topography will not result in an increase in flood levels at neighbouring properties for flood events up to and including the 1% AEP and will not increase flood hazard at adjacent properties for events up to and including the PMF. Further, under the PMF scenario assessed, the western portion of the site is shown to remain flood-free, so evacuation from the facility due to PMF would not be necessary.

As such, the proposal will not materially impact the flood risk at neighbouring properties.

12.3.2.3 Water balance

A site water balance has been completed to estimate the annual potable water demands, sewage discharges and stormwater runoff from the site. It is noted that the main source of water demand is for the EfW process. and measures have been incorporated into the design to reuse process water as much as possible. Water consumption has been optimised such that water is wholly consumed by the EfW process, with water lost to a combination of steam or quenching of the Incinerator Bottom Ash (IBA). No remaining process water is discharged to sewer. The only water discharged to sewer would be through daily use of bathrooms and kitchens in the administration building and visitor and education centre and general washdown of the facility.

A summary of the results of the site water balance is included in **Table 12.2.**

Table 12.2: Proposal site water balance

Water source/demand	Average annual total (kL)	
	Inflow	Outflow
Rainfall on site	50,000	
Rainwater used for process		12,000
Stormwater discharge from site		32,000
Stormwater infiltration and evapotranspiration on pervious areas		6,000
Potable water supply	281,000	
Potable water used for process		272,000
Discharge to sewer		9,000

12.4 Mitigation

Table 12.3 describes the mitigation measures that will be applied to address potential hydrological and flooding impacts associated with the proposal.

Table 12.3: Hydrology and flooding mitigation measures

ID	Impact	Mitigation measures
Construction mitigation measures		
HF1	Water quality	As part of a Soil and Water Management Plan (part of the CEMP), the contractor will be responsible for monitoring the quality of stormwater discharged from the site construction area via sedimentation basins. Water quality in the overland flow path through the site, including at the site discharge point, will also be monitored constantly throughout construction.
HF2	Erosion, sediment and pollution control	As part of a Soil and Water Management Plan (part of the CEMP), during the construction phase all works or activities are to be carried out in line with Managing Urban Stormwater: Soils and Construction (The Blue Book).
HF3	Quality of stormwater runoff and downstream environmental impacts	As part of a Soil and Water Management Plan (part of the CEMP), a sediment control plan and strategy covering cut-off drains, shaker pads, check dams and sediment basins will be developed. This will improve the quality of stormwater runoff from the site and minimise downstream environmental impacts.
HF4	Water quality associated with farm dam dewatering	As part of the CEMP, a Dewatering Management Plan would be prepared before the decommissioning and dewatering of the farm dam. The Plan will describe the dewatering method, monitoring of water quality and measures to minimise risk to water quality in the overland flow path.
HF5	Water demand	As part of the CEMP, arrangements will be developed for the reuse of stormwater collected in sediment basins for site activities such as dust suppression, to minimise potable water demand for construction activities.
HF6	Flood impacts on neighbouring properties during construction	Locate site facilities and construction access tracks away from the existing overland flow path and recognised 1% AEP flood extent. This will offer a level of flood immunity to these facilities and minimise flood impacts on neighbouring properties. The construction site layout will be confirmed through the CEMP.

ID	Impact	Mitigation measures
Operation mitigation measures		
HF7	Water quality	In line with BCC water sensitive urban design (WSUD) principles and the stormwater pollutant reduction targets, water quality impacts associated with the proposal will be mitigated through: • The bioretention basin with a permanent pond depth and filtration media which will be planted with suitable nutrient-removing vegetation. It will also be installed with permanent water quality monitoring devices. • Site runoff through each trunk drain will pass through a gross pollutant trap before discharge to the basin. • Oil and water separators, including shut-off valves.
HF8	Water quality	During site operations it is proposed to permanently monitor stormwater discharge at the outlet from the OSD basin. As all site stormwater runoff from the development area will be directed to the basin, this will enable the quality of runoff from the site to be monitored effectively. The permanent testing will monitor a range of parameters representative of general water quality, including: • Dissolved oxygen (DO) • Turbidity • pH • Total suspended solids • Total nitrogen • Total phosphorus.
HF9	Downstream flooding impacts	Stormwater runoff from the proposal site will be controlled by an OSD basin and the overland flow path will be realigned and revegetated to minimise offsite flooding impacts.
HF10	Runoff and chemical and hydrocarbon spills	Runoff from sensitive areas with the potential to cause spills of chemicals or hydrocarbons will be contained by bunding, and runoff will pass through oil and water separators.
HF11	Water demand	Rainwater harvesting of main building roof runoff for reuse in the EfW plant process, to reduce reliance on potable water.

Chapter 13

Noise and vibration

13 Noise and vibration

13.1 Introduction

This chapter summarises the potential noise and vibration impacts of the proposal during construction and operation. A Noise and Vibration Impact Assessment (NVIA) has been prepared and is included as **Technical Report I**.

The methodology for the NVIA included:

- Finding out the nearest and most potentially affected noise and vibration sensitive receivers
- Gaining a clear understanding of the existing noise environment through noise monitoring at selected locations
- Detecting the noise and vibration sources during construction and operation of the proposal
- Carrying out a noise and vibration assessment for both construction and operation impacts. This included quantitative assessments for noise impacts, using SoundPlan noise modelling software.

The NVIA was prepared following the below guidelines:

- NSW Noise Policy for Industry (NPfI)
(Environment Protection Authority, 2017)
- NSW Road Noise Policy
(Department of Environment, Climate Change and Water (DECCW), 2011)
- Interim construction noise guideline (ICNG)
(Department of Environment and Climate Change (DECC), 2009)
- Assessing vibration: A technical guideline
(Department of Environment and Conservation, 2009).

13.2 Existing environment

Figure 13.1 shows sensitive receivers close to the proposal site and potentially affected by noise and vibration from the proposal. Land uses that are sensitive to noise include residential areas, churches, hospitals, schools and recreation areas[1].

The nearest residential receivers are located about 1km to the south of the proposal (recorded as R1 and R2 on **Figure 13.1**). The nearest industrial receivers are directly adjacent to the proposal site at I1 and I2. Commercial activities are located at C1 and C2.

[1] NPfI, 2017.

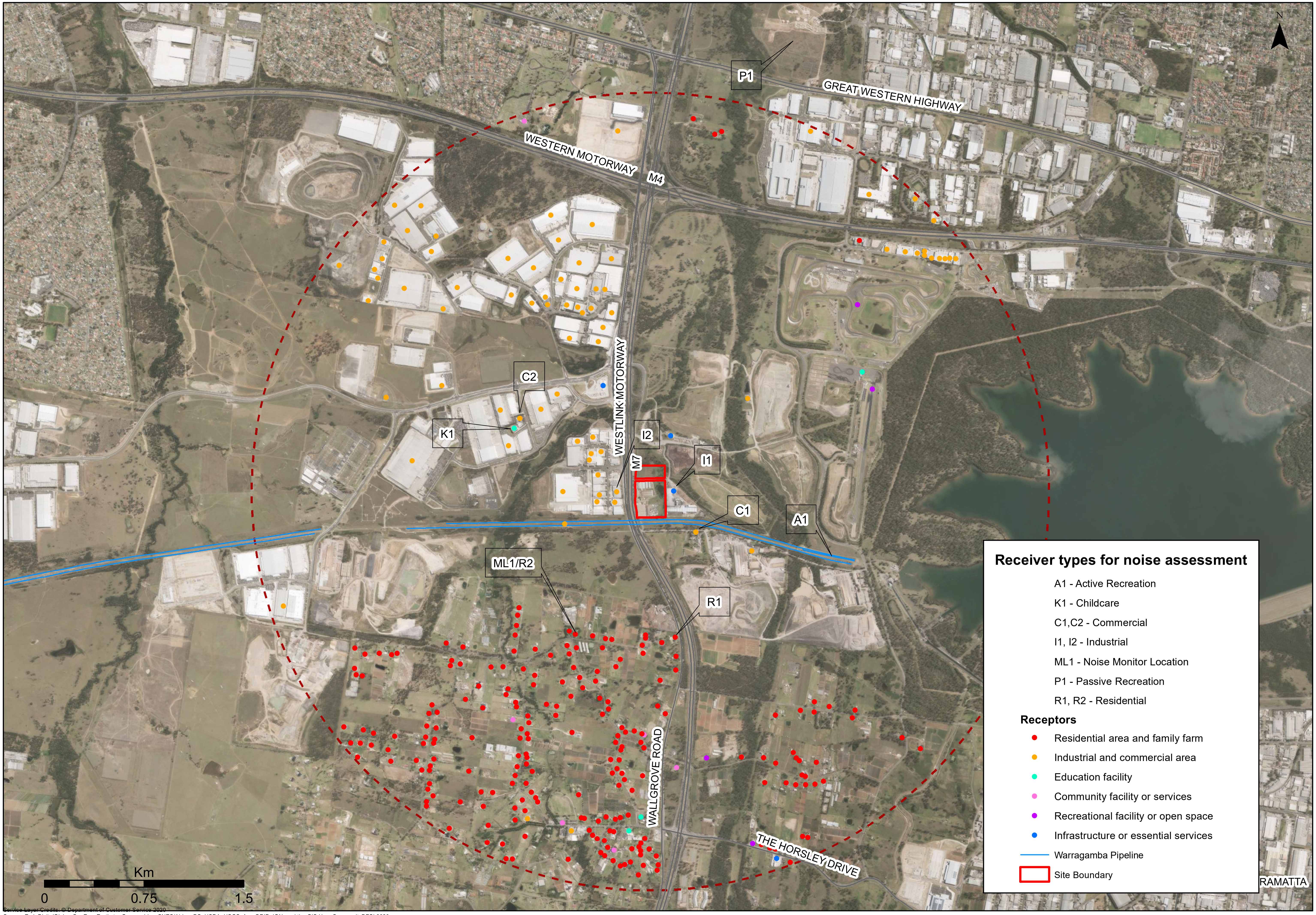
A childcare centre is in the Eastern Creek Industrial Area (K1). Bungarribee Trail is part of the Western Sydney Parklands (WSP) located at least 3km north-east of the proposal site (P1).

The nearest active recreation area is the Sporting Car Club, Sydney Dragway and Motorsport Park located about 1km to the east of the proposal (A1).
The WaterNSW Warragamba Pipeline Corridor is a sensitive utility and is located immediately adjacent to the proposal site's southern boundary.

Table 13.1 lists the sensitive receiver and noise logger locations

Table 13.1: Receiver and noise logger locations

Receiver	ID	Address	Distance to site (m)
Residential	R1	783 Wallgrove Road, Horsley Park	920
	R2	58 Burley Road, Horsley Park	955
Commercial	C1	Brickworks Building Products, 738–780 Wallgrove Road, Horsley Park	260
	C2	Plus Fitness 24/7, 7–9/2A Southridge Street, Eastern Creek	935
Industrial	I1	Global Renewables, Wallgrove Road, Eastern Creek	70
	I2	Century Yuasa Batteries, 17 Shale Place, Eastern Creek	105
Childcare	K1	Little Graces Childcare Centre, Unit 2, Southridge Street, Eastern Creek	965
Passive recreational areas	P1	Bungarribee Trail, Western Sydney Parklands, Eastern Creek	3200
Active recreation area	A1	North Shore Sporting Car Club, Ferrers Road, Eastern Creek	1240
Noise logger	ML1	58 Burley Road, Horsley Park	955



Service Layer Credits: © Department of Customer Service 2020
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User CommunityDFSI 2020

Figure 13.1: Sensitive noise receivers

A noise logger was located at 58 Burley Road, Horsley Park, to perform unattended long-term noise measurements. This noise logger is representative of the nearest residential receivers (and potentially the most affected receivers). Noise measurements were carried out between Thursday, 6 February 2020 and Monday, 17 February 2020, to capture noise levels.

The noise measurements from the noise logger are used to define the existing background noise levels referred to as rating background levels (RBL) (Column A in **Table 13.2**). The ambient noise is the noise level measured at a receptor location considering multiple noise sources (Column B in **Table 13.2)**.

Table 13.2: Long-term noise monitoring results, dB(A)

Location	Time period[2]	Column A Rating Background Levels (RBL) L_{A90}	Column B Ambient L_{Aeq} noise levels
ML1 – 58 Burley Road, Horsley Park NSW 2175	Day	42	52
	Evening	47	57
	Night	43	51

The measured noise levels in the evening and night were higher than those measured in the day. This is because the influence of the Westlink M7 motorway (the M7) and industrial activities which operate 24/7 in the area. The results from the noise measurements show that the existing noise environment is mainly influenced by the traffic noise on the M7 and by wildlife (birds and insects).

13.3 Assessment

13.3.1 Construction noise impacts

The construction noise impacts have been assessed using a quantitative assessment method and following the Interim Construction Noise Guideline (ICNG) (DECC, 2009). The ICNG focuses on applying a range of work practices to minimise construction noise impacts, rather than focusing on achieving numeric noise levels. The ICNG outlines how construction noise management levels should be recognised for each type of noise receiver, including residential, recreational areas, commercial, and industrial. Based on the existing environment noise results and the ICNG criteria, noise management levels have been set for each noise receiver group near the proposal site.

[2] Day: 07:00 to 18:00 Monday to Saturday and 08:00 to18:00 Sundays and public holidays
Evening: 18:00 to 22:00 Monday to Sunday and public holidays
Night: 22:00 to 07:00 Monday to Saturday and 22:00 to 08:00 Sundays and public holidays
As required by the NPfI, the external ambient noise levels presented are free-field noise levels [no façade reflection]. No correction was needed to the measured results.

Residential receivers can be 'noise affected' where construction activities result in construction noise 10dB above the existing environment[3]. Residential receivers who are 'highly noise affected' are those who would receive construction noise levels above 75dB$L_{Aeq(15minute)}$, which could elicit a strong community reaction to the noise.

It is anticipated that most construction activities will be carried out within standard construction hours (Monday to Friday 7am to 6pm, Saturday 8am to 1pm, no work on Sunday or public holidays). The ICNG acknowledges that the following activities have justification to be carried out outside the standard recommended construction hours, assuming all feasible and reasonable mitigation measures are employed to minimise the impacts to the surrounding sensitive land uses:

- The delivery of oversized plant or structures that police or other authorities determine to need special arrangements to transport along public roads
- Emergency work to avoid the loss of life or damage to property, or to prevent environmental harm
- Works where a proponent demonstrates and justifies a need to operate outside the recommended standard construction hours.

The construction noise management levels for the proposal were calculated for each noise receiver group and are presented in **Table 13.3**.

Table 13.3: ICNG Construction noise management levels

Receiver	Standard hours $L_{Aeq(15\ min)}$[4]	
	Noise affected	Highly noise affected[5]
R01	52	75
R02	52	75
C1	70	-
C2	70	-
I1	75	-
I2	75	-
K1	65	-
P1	60	-
A1	65	-

[3] DECC, 2009
[4] 7am to 6pm Monday to Friday, 8am to 1pm Saturday, no work on Sunday or public holidays.
[5] Applies to residential receivers only as defined in the ICNG.

The construction for the proposal has been split into five phases:

1. Demolition
2. Site establishment and enabling works
3. Main construction works
4. Testing and commissioning
5. Finishing and landscaping.

Construction noise levels have been calculated for each construction phase by applying a sound power level to each item of construction equipment assumed to be used in each construction phase. These are compared to the noise management levels assigned to each sensitive receiver group.

Table 13.4 shows the predicted construction noise levels.

Table 13.4: Predicted construction noise levels at sensitive receivers, dB(A)[6]

Rec ID	Receiver type	Predicted Noise Level, $L_{Aeq,15min}$ Construction Phases			Noise management levels – Standard hours $L_{Aeq,15min}$	
		Phase 1 Demolition	Phase 2 Earthworks and enabling	Phase 3–5 Construction, testing, commissioning, finishing and landscaping	Noise affected	Highly noise affected
R1	Residential	68	63	63	52	75
R2	Residential	67	63	63	52	75
C1	Commercial	79	74	74	70	-
C2	Commercial	67	63	63	70	-
I1	Industrial	90	86	85	75	-
I2	Industrial	86	82	82	75	-
K1	Child Care	67	63	63	65	-
P1	Passive recreation area	57	52	52	60	-
A1	Active recreation area	64	60	60	65	-

The table above shows that for the proposed construction activities, during all construction phases, the noise management level would be exceeded for residential receivers, industrial receivers and some commercial receiver groups.

The demolition phase would also exceed the noise management level for the childcare centre on Southridge Street in the Eastern Creek industrial area.

[6] dB(A) denotes a single-number sound pressure level that includes a frequency weighting ('A-weighting') to reflect the subjective loudness of the sound level.

The predicted noise levels are calculated using a worst-case scenario. The actual construction noise impacts are dependent on the intensity and location of activities, the type of equipment used and background noise levels in the construction period. The above predicted construction noise levels are generally conservative and do not represent a constant noise that would be experienced daily by the sensitive receivers throughout the proposal's construction period. Noisy equipment would not be operated continuously, rather for brief periods of time as needed. All construction noise will be mitigated by standard measures outlined in a Construction Noise and Vibration Management Plan (CNVMP). When applying these measures, the construction noise impacts are no greater than what could be expected from typical construction impacts.

In addition to the potential noise impacts from equipment operating on the proposal site, construction vehicles could increase the noise generated from the road network. Trucks will be used to remove construction and demolition (C&D) waste from the site travelling on Old Wallgrove Road, Wallgrove Road and the M7. It is estimated that the additional traffic on the road network generated by the construction of the proposal would increase noise levels by less than 2dB, so it would not be audibly noticeable from any sensitive receivers.

13.3.1.1 Construction vibration impacts

Vibration generated by construction activity can cause cosmetic or structural damage to nearby buildings, depending on the construction equipment used and the proximity to buildings and structures. Vibration can also cause adverse response from people occupying surrounding buildings.

Criteria for assessing human response to vibration is set out in the NSW Assessing Vibration: A Technical Guideline (DEC, 2006). The criteria are based on the British Standard (BS) 6472-1992 Evaluation of human exposure to vibration in buildings (1–80Hz). British Standard 7385:2:1993 and German standard DIN 4150-3:2016 set out guideline values for vibration effects on structures. In the absence of an Australian standard, the German standards were used in the NVIA to assess potential vibration impacts on the WaterNSW Warragamba pipelines following WaterNSW Guidelines for Development Adjacent to the Upper Canal and Warragamba Pipelines (WaterNSW, 2020).

There are no structurally sensitive buildings, such as unsound buildings or heritage buildings, located within proximity to the proposal site that would experience any cosmetic or structural damage as a result of the proposed construction activities.

The WaterNSW Warragamba Pipeline Corridor is located 18m to the south of the proposal site. The proposed construction measures will make sure there are no vibration impacts on the WaterNSW Warragamba pipelines.

Equipment to be used during construction near the pipeline will be chosen carefully to avoid vibration impacts. This will include low vibration generating equipment, such as the use of smaller excavator hammers and bore pilling.
Table 32 of the NVIA sets out the indicative recommended minimum working distances for vibration intensive activities. Vibration monitoring will be conducted at the beginning of any vibration generating activities to confirm minimum working distances required to avoid vibration impacts. The purpose of the monitoring program is to avoid vibration over set criteria. Trigger levels would be set, which when reached, would stop any work. Work would only continue with alternative construction methods so that any vibration impacts are avoided.
The above measures to avoid impacts to the Warragamba pipelines will be outlined in the CNVMP.

13.3.1.2 Operational noise impacts

Noise impacts from sources within the site

Operational noise emissions from the proposal have been assessed in line with the NPfI (EPA, 2017), which seeks to control intrusive noise impacts in the short term for residences and maintain long-term noise level amenity for residences and other land uses.

'Amenity noise levels' are set for the proposal and should protect against noise impacts, such as speech interference, community annoyance and some sleep disturbance. 'Intrusive noise levels' are those that intrude above the background level by more than 5dB. 'Sleep disturbance levels' are reached when noise causes awakenings and disturbance to sleep stages.

When assessing the noise levels for the proposal, two types of weather conditions were considered – standard (minimal wind conditions) and enhanced (greater wind conditions). See section 4.3 of the NVIA for further explanations of enhanced conditions.

The NVIA predicts noise levels based on the likely activities to occur during operation of the proposal. During operation, the main noise sources generated within the site are from vehicle movements, including trucks, staff vehicles and buses, and the operation of the EfW facility.

Table 13.5 compares the predicted noise levels from the operation of the facility to the noise criteria for amenity level, intrusive level and sleep disturbance, as established in line with NPfI.

Table 13.5 shows the noise levels for each receiver group. The daytime and night-time scenarios have been considered. An evening period is not considered as the night-time scenario represents the worst case.

Table 13.5: Predicted noise levels during the operation of the proposal

Receiver ID	Weather conditions	Predicted levels					Criteria					Compliance				
		Intrusive assessment dBA (dBC)		Amenity assessment dBA (dBC)		Sleep disturbance dBA	Intrusive criteria dBA		Amenity criteria dBA		Sleep disturbance dBA	Complies with intrusive criteria?		Complies with amenity criteria?		Complies with sleep disturbance criteria?
		Day	Night	Day	Night	Night	Day	Night	Day	Night	Night	Day	Night	Day	Night	Night
R1	Standard	41 (50)	40 (50)	40 (49)	39 (49)	40	47	47	55	40	57	YES	YES	YES	YES	YES
	Enhanced	44 (52)	43 (52)	43 (51)	42 (51)	45	47	47	55	40	57	YES	YES	YES	NO	YES
R2	Standard	37 (45)	36 (45)	35 (44)	35 (43)	38	47	47	55	40	57	YES	YES	YES	YES	YES
	Enhanced	40 (47)	40 (47)	38 (46)	38 (45)	43	47	47	55	40	57	YES	YES	YES	YES	YES
C1	Standard	52 (60)	51 (59)	51 (59)	50 (58)	56	N/A	N/A	60	60	N/A	N/A	N/A	YES	YES	N/A
	Enhanced	54 (62)	54 (61)	53 (60)	53 (60)	61	N/A	N/A	60	60	N/A	N/A	N/A	YES	YES	N/A
C2	Standard	39 (48)	38 (48)	37 (47)	36 (46)	43	N/A	N/A	60	60	N/A	N/A	N/A	YES	YES	N/A
	Enhanced	43 (51)	42 (50)	41 (49)	40 (49)	48	N/A	N/A	60	60	N/A	N/A	N/A	YES	YES	N/A
I1	Standard	64 (71)	63 (70)	62 (69)	62 (69)	71	N/A	N/A	65	65	N/A	N/A	N/A	YES	YES	N/A
	Enhanced	66 (72)	65 (71)	64 (71)	64 (71)	74	N/A	N/A	65	65	N/A	N/A	N/A	YES	YES	N/A
I2	Standards	61 (66)	59 (65)	57 (63)	57 (63)	67	N/A	N/A	65	65	N/A	N/A	N/A	YES	YES	N/A

Receiver ID	Weather conditions	Predicted levels					Criteria					Compliance				
		Intrusive assessment dBA (dBC)		Amenity assessment dBA (dBC)		Sleep disturbance dBA	Intrusive criteria dBA		Amenity criteria dBA		Sleep disturbance dBA	Complies with intrusive criteria?		Complies with amenity criteria?		Complies with sleep disturbance criteria?
		Day	Night	Day	Night	Night	Day	Night	Day	Night	Night	Day	Night	Day	Night	Night
	Enhanced	63 (68)	62 (67)	60 (65)	60 (65)	71	N/A	N/A	65	65	N/A	N/A	N/A	YES	YES	N/A
K1	Standard	39 (48)	38 (48)	37 (47)	36 (46)	43	N/A	N/A	50	50	N/A	N/A	N/A	YES	YES	N/A
	Enhanced	43 (51)	42 (50)	41 (49)	40 (49)	48	N/A	N/A	50	50	N/A	N/A	N/A	YES	YES	N/A
P1	Standard	<30 (<30)	<30 (<30)	<30 (<30)	<30 (<30)	<30	N/A	N/A	45	45	N/A	N/A	N/A	YES	YES	N/A
	Enhanced	<30 (<30)	<30 (<30)	<30 (<30)	<30 (<30)	<30	N/A	N/A	45	45	N/A	N/A	N/A	YES	YES	N/A
A1	Standard	36 (46)	35 (45)	35 (45)	35 (45)	38	N/A	N/A	50	50	N/A	N/A	N/A	YES	YES	N/A
	Enhanced	40 (48)	39 (48)	38 (47)	38 (47)	43	N/A	N/A	50	50	N/A	N/A	N/A	YES	YES	N/A

Note: dBC values have been included for the assessment of low-frequency noise

Noise generated from the operation of the proposal is predicted to comply with noise criteria at all sensitive receivers during standard weather conditions.
In enhanced weather conditions where the noise is carried further, a minor exceedance (less than 2dB) in the night-time period is predicted at residential receiver R1, located to the south of the site in Horsley Park. An increase in 2dB represents a minor impact that is considered barely perceptible to the average person.

The noise modelling has shown that the main noise sources for the R1 receiver would be from the boiler hall and the flue gas treatment hall. The noise modelling has assumed a worst-case scenario that any windows from the EfW facility are open. In the detailed design stage, the building envelope and plant and equipment would be reviewed to decide how the proposal can comply with noise criteria.

The results in **Table 13.5** also indicate that the difference between dBC and dBA values is less than the 15 dB (NPfI low frequency screening criterion) indicating that low frequency noise is not present at the receivers. Further assessment of low frequency would be undertaken as the design progresses.

The noise impacts on biodiversity are assessed in **Chapter 21 Biodiversity** and **Technical report Q Biodiversity Development Assessment Report**.

Noise impacts from increased road traffic

The NSW Road Noise Policy (RNP)[7] sets out criteria for assessing noise impacts associated with increased traffic on public roads. The RNP states that if a predicted noise increase on public roads is less than 2dB, then no further assessment is needed.

The proposal would increase truck movements along Old Wallgrove Road, Wallgrove Road and the M7. The results in the NVIA show that the predicted increase in noise levels would be below the RNP screening criteria (less than 2dB change) and therefore impacts would be negligible and not be perceived as a noticeable increase in noise for receivers along these road corridors.

13.3.1.3 Operational vibration impacts

There are several vibration generating activities that will be used during operation of the proposal, including a turbine and the air-cooled condensers. The proposal will include appropriate construction to limit vibration transmissions through the ground. This includes using piled rafts which will incorporate a spring damper system, to reduce the vibration effect of the equipment. With these design-embedded mitigation measures in place, there are no predicted operational vibration impacts at surrounding sensitive receivers or structurally sensitive infrastructure.

[7] DECCW, 2018.

13.4 Mitigation

Table 13.6 describes the measures that would be applied to mitigate against, minimise, manage and monitor the potential noise and vibration impacts. These mitigation measures will make sure that the noise impacts from the proposal are acceptable.

Table 13.6: Noise and vibration mitigation measures

ID	Impact	Mitigation
Design embedded mitigation measures		
NV1	Noise from the operation of the EfW facility	The building design mitigates noise impacts by being an almost fully enclosed building. Further opportunities will be recognised in the detailed design stage so that the proposal mitigates against any non-compliances with the noise criteria.
NV2	Vibration from operational equipment	An assessment of natural frequencies of footings will be completed so that resonant response does not occur during ramp-up, operation and ramp-down of the generator turbine. The building design will include piles where appropriate, to reduce vibration impacts from the turbine and air-cooled condensers.
Construction mitigation measures		
NV3	Construction noise	A detailed Construction Noise and Vibration Management Plan (CNVMP) will be prepared. This plan will include, but not be limited to, the following: • Roles and responsibilities • Noise sensitive receiver locations • Noise mitigation strategy • Monitoring methods • Community engagement strategy.
NV4	Vibration impacts on the WaterNSW Warragamba pipelines	Works near the Warragamba Pipeline Corridor will be monitored for vibration. This will include setting trigger levels and adapting the construction methods accordingly.
Operational mitigation measures		
NV5	Noise from the operation of the EfW facility	As part of the OEMP, specific noise management measures will be included so that the ongoing operation of the EfW facility adheres to noise criteria and avoids adverse noise impacts on sensitive receivers. A six-month post-commissioning report would be prepared as part of this OEMP.

Chapter 14

Hazard and risk

14 Hazard and risk

14.1 Introduction

This chapter summarises the potential impacts in terms of hazard and risk associated with the construction and operation of the proposal, including an assessment of whether the proposal is categorised as a potentially hazardous or offensive industry for the purposes of the State Environment Planning Policy 33 – Hazardous or offensive development (SEPP 33).

Clause 3 of the SEPP 33 states:

'Potentially hazardous industry *means 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.'

Clause 4 of the SEPP 33 states:

'Hazardous industry *means a development for the purposes of an industry which, when the development is in operation and when all measures proposed to reduce or minimise its impact on the locality have been employed (including, for example, measures to isolate the development from existing or likely future development on other land in the locality), would pose a significant risk in relation to the locality—*

(a) to human health, life or property, or

(b) to the biophysical environment.'

A Preliminary Hazard Analysis (PHA) has been prepared and is included as **Technical report J**. The PHA details all potential hazards and risks and analyses the consequences of potential incidents and the likelihood of such events occurring.

The methodology for the PHA involved:

- A screening assessment involving classification of each of the potentially dangerous goods stored at and transported to and from the site and a review of the quantities of dangerous goods against relevant guideline thresholds
- Determining the level of risk assessment necessary for each dangerous good through a workshop
- Conducting a risk assessment according to the level determined during the workshop and recognising the potential offsite impacts and mitigation measures.

The PHA was prepared in line with the following:

- SEPP 33
- Applying SEPP 33 – Hazardous and Offensive Development Application Guidelines (Applying SEPP 33) (DoP, 2011)
- Multi-level Risk Assessment, Assessment Guideline (Department of Planning and Infrastructure, 2011)
- Hazardous Industry Planning Advisory Paper (HIPAP) No. 4, Risk Criteria for Land Use Safety Planning (DoP, 2011)
- HIPAP No. 6, Hazard Analysis (DoP, 2011).

The chapter also assesses whether the proposal would be categorised as a potentially offensive industry for the purposes of SEPP 33, drawing on the assessment of potential pollution in other parts of the EIS (for example, noise and odour).

Clause 3 of the SEPP 33 states:

***'Potentially offensive industry** means 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.'*

Clause 4 of the SEPP 33 states:

*'**Offensive industry** means a development for the purposes of an industry which, when the development is in operation and when all measures proposed to reduce or minimise its impact on the locality have been employed (including, for example, measures to isolate the development from existing or likely future development on other land in the locality), 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 in the locality.'*

14.2 Existing environment

The proposal site is located within an area characterised by mostly industrial and transport infrastructure. The site is located next to waste facilities, such as:

- The SUEZ Eastern Creek Waste Management Centre comprising the now-closed landfill site and operational resource recovery facility, located to the north and north-east
- The operational Global Renewables waste management facility located immediately to the east.

To the west of the site is the M7 motorway and Eastern Creek industrial area and to the south of the site is the Warragamba Pipeline Corridor and the Austral Bricks facility. Hazards and offensive pollutants have the potential to impact neighbouring properties near the proposal or along haulage routes.

The nearest residential area is located around 1km to the south of the site in Horsley Park, with the Minchinbury residential area located around 3km to the north-west. Horsley Park Public School is located over 2km south of the site and a childcare centre is located within the Eastern Creek industrial area about 1km to the west of the site.

14.3 Assessment of potentially hazardous development

The storage and transportation of dangerous goods has the potential to cause hazards, such as fires, spills and explosions, if not managed appropriately. The following sections assess the potential risks from the storage and transportation of dangerous goods during construction and operation of the proposal.

14.3.1 Construction

The majority of hazard and risks are acknowledged during operation of the proposal. However, there are potential hazards and risks during construction. These include:

- Handling of contaminated soils – addressed in **Chapter 11 Soils and water** and **Technical report G Geotechnical Investigation Report and Contamination Investigation**
- Spills of dangerous goods during construction
- Construction vehicle or machinery incidents.

The CEMP will include measures to avoid these hazards and risks during construction.

14.3.2 Operation

The State Environment Planning Policy 33 – Hazardous and Offensive Development (SEPP 33) seeks to recognise and assess whether a proposed development for the purpose of industry or storage is potentially hazardous, as defined earlier.

The Applying SEPP 33 Guidelines note that the permissibility of a proposal to which the policy applies is linked to its safety, and the merits of proposals should be properly assessed in terms of offsite risk before being determined.

Dangerous goods and screening analysis

Under the Applying SEPP 33 guidelines, a development is considered potentially hazardous and requires a PHA if the storage or transport of hazardous materials exceeds specific screening thresholds outlined in Hazardous and Offensive Development Application Guidelines: Applying SEPP 33.

The NSW EPA describes dangerous goods as

'*substances and objects that pose acute risks to people, property and the environment due to their chemical or physical characteristics'*.

The proposal will require use of dangerous goods and will create dangerous goods as by-products throughout the operation of the EfW facility. A screening analysis was carried out which compared the quantities of dangerous goods necessary for the proposal against the thresholds. This is shown in **Table 14.1**. The quantities used in the screening assessment are estimates and will be refined during detailed design of the proposal.

Table 14.1: Dangerous goods used or created as a by-product from the EfW facility and screening

Dangerous good	Use onsite / by-product	Class	Quantity	Screening limit	Above or below threshold
Hydraulic oil	Hydraulic and lubrication oils are necessary consumables for the ongoing operation and lubrication of the grate, cranes, turbine and other mechanical equipment used at the facility.	3	~1t	2t and 3m from boundary	Below
Lubrication oil		3	~1t	2t and 3m from boundary	Below
Activated carbon	Added to the flue gas where it absorbs dioxins and furans, gaseous mercury, and other components	4.2	50t	1t	Above
Ammonia (ammonium hydroxide, 25% concentration)	Used in the Selective Non-Catalytic Reduction (SNCR) process where ammonia is injected into the boiler to reduce nitrogen oxide emissions in the combustion process	8	100t	50t	Above
Propane/acetylene	Necessary for welding repairs during maintenance operations	2.1	<100kg	100kg	Below
Phosphine	Associated with the incineration of phosphorous-rich waste, such as bone meal. The formation is slow and is usually avoided through proper ventilation of the IBA storage bays. This is a rare issue and has only been recorded in energy recovery facilities that contain an animal crematorium. This facility will not have an animal crematorium.	2.3	~350mg/hr	100kg	Below. By-product slowly produced by maturation of IBA
Hydrogen (gaseous)	Created from a reaction between IBA and the water used to cool IBA and prevent dust generation. This is due to the presence of aluminium and its reaction with regenerated water.	2.1	~7kg/hr	100kg	Below. By-product slowly produced by maturation of IBA

Dangerous good	Use onsite / by-product	Class	Quantity	Screening limit	Above or below threshold
Sodium hydroxide	Used within the wet scrubber to reduce acid gases and other flue gas components	8	50t	25t	Above
Hydrochloric acid	Used in water treatment regeneration.	8	1t	25t	Below
Flue Gas Treatment residues (FGTr)	FGTr is the name given to any residues that are extracted from the process after the addition of flue gas treatment reagents. FGTr is a combination of spent reagents and the leftover entrained ash within the flue gases that did not become deposited in the boiler section.	6.1	360t	0.5–2.5t	Above
Diesel	While diesel is not classified as a dangerous good, it can add to the fuel load if in fire, and hence must be considered when assessing the site.	N/A – however it is a C1 combustible liquid	140t	N/A	N/A
Lime (Calcium hydroxide)	Added to the flue gas where it neutralises acidic components. This is also not a dangerous good.	N/A	200t	N/A	N/A

There are four dangerous goods which exceed the thresholds, including:

- Activated carbon: the proposal will have 50t onsite, which exceeds the screening limit of 1t.
- Ammonia: the proposal will have 100t onsite, which exceeds the screening limit of 50t.
- Sodium hydroxide: the proposal will have 50t onsite, which exceeds the screening limit of 25t.
- Flue gas treatment residues (FGTr): the proposal will have 360t onsite, which exceeds the screening limit of 0.5–2.5t. The FGTr will also exceed the transportation thresholds.

The proposal will exceed the above thresholds, so the proposal is considered potentially hazardous as per SEPP 33, and a PHA is needed.

Assessment of hazards

As part of the PHA, the design team carried out a multi-level risk assessment and hazard identification study (HAZID) assessment on 28 February 2020 and 6 March 2020. The purpose of these two workshops was to determine what level of analysis is necessary for each potential hazard/risk in line with the multi-level risk assessment (DPI, 2011).

Fire in the waste bunker, formation of hydrogen in IBA, activated carbon dust explosion, diesel spill and bund fire and ammonium hydroxide dispersion hazards required a risk assessment following the criteria set out by HIPAP4 – *Risk Criteria for Land Use Safety Planning*. This risk assessment is undertaken for scenarios that have potential offsite consequences. For the remaining hazards, a qualitative level (Level 2) assessment was carried out.

All identified hazards are assessed in **Table 14.2**.

Table 14.2: Hazards, the required level of analysis and impact assessment

Identified hazard	Impact assessment
Fire in tipping hall	There are multiple scenarios that could result in a fire within the tipping hall (smouldering waste within a waste truck, a truck breakdown or a truck crash). The exact controls to mitigate against these types of events will be developed as the design progresses. In general, the design will include fire detection within the tipping hall, operational response plans to fires, truck breakdowns or truck crashes, automatic fire suppression systems, manual fire intervention systems and fire hydrant systems. The site can accommodate emergency vehicle access. As the tipping hall is enclosed, and with the above management methods proposed, there are not expected to be any offsite impacts.
Fire in waste bunker	The main cause of a fire occurring in the waste bunker would be from smouldering waste tipped into the bunker, waste left for extended periods which self-heats from decomposition processes or sparks from the shredder. Section 4.6 and Appendix H of the PHA provide a detailed assessment of fire in the waste bunker. The waste bunker will be equipped with a variety of fire safety systems, including continuous temperature monitoring, to recognise and control or suppress a potential fire within the bunker. This includes water cannons specified with thermal imaging and automatic targeting. Management and operational working methods to prevent a fire occurring will also be employed. The containment of a fire within the bunker hall will also prevent any impacts offsite.
Build-up of flammable gas in waste bunker	When waste decomposes, there is the potential for methane and other flammable gases to form in the waste bunker, causing a fire. To avoid this, waste will only be stored in the bunker for five days, which is not enough time to allow these flammable gases to build up. In addition, the facility is designed to operate under inward pressure, so that the furnace draws in air from the tipping hall and waste bunker. Any methane in the waste bunker will be drawn to the furnace where it can be combusted safely. This design will avoid the risk of flammable gas causing a fire in the waste bunker.
Dust explosion in tipping hall and bunker	Dust will be generated in the tipping hall from the large volume of waste movement. This has a risk of causing a dust explosion. The design for the tipping hall will avoid horizontal surfaces where possible, to prevent dust build-up. As part of the ongoing management plan during operation, the vacuum cleaning system is to be used, to reduce the likelihood of dust build-up. These measures will reduce the risk of a dust explosion in the tipping hall and prevent offsite impacts.
Formation of phosphine and hydrogen in IBA	The composition of waste being burned and method of cooling the IBA has the potential to cause both phosphine and hydrogen to form – both dangerous goods. The facility will not be accepting any animal remains, and therefore it is unlikely that phosphine will be present as a by-product in the IBA. If not managed appropriately, these dangerous goods could cause fires within the IBA building as they have low flammability limits. Proper ventilation of the IBA building is considered enough to mitigate the consequence of any build-up of unexpected phosphine. The IBA bunker will be designed so that gases produced by IBA will be drawn into the furnace and incinerated. IBA will be transported offsite in open air tankers to ventilate the IBA and prevent the build-up of hydrogen. (Refer to section 3.2.5 of the PHA). In addition, the IBA building will have hydrogen gas sensors and monitors which include alarms that tell staff when to manually activate the ventilation system if necessary.

Identified hazard	Impact assessment
Reaction between acid and base	Acids and bases will be required for the water treatment and flue gas treatment, such as sodium hydroxide, as explained below. The exact chemicals for water treatment will be selected as the design progresses and incompatible chemicals will not be stored in the same bunded area. Acids and bases will be stored in line with AS 3780-2008 and in line with obligations under section 5 of chapter 7 of the *Work Health and Safety Regulation 2011*. This includes the specific requirements of containing and managing spills under subdivision 2.
Sodium hydroxide	An interaction between sodium hydroxide and ammonia hydroxide could generate corrosive products, gas, heat and toxic products. These substances are incompatible and will not be stored in the same bunded area or in compounds that share a common drainage system. The bund for sodium hydroxide will be at least 100% of the capacity of each silo where the chemical is stored. Further, the transport of sodium hydroxide to the site is to be within a sealed tanker, and transfer into the tank is to be self-contained (through sealed piping).
Release of lime (calcium hydroxide)	While not classified as a dangerous good, a loss of control of lime (calcium hydroxide) has the potential to cause injuries as a mass powder substance. Calcium hydroxide will be stored in a silo so it is not released into the atmosphere, so will avoid impacts to the environment and offsite impacts.
UPS batteries fire/explosion	The site will include uninterruptable power supply (UPS) batteries in case of a power loss and to allow for continuous operation. The battery system will be either lead acid batteries or lithium-ion batteries. Lead acid batteries can produce hydrogen and can create an explosive atmosphere. The batteries will be stored in a battery room which is properly ventilated and designed so that hydrogen does not build up. Hydrogen detection equipment may be installed to detect any build up. The risk associated with lithium batteries is an overloading of the battery and a subsequent fire. Standard mitigation and protection measures will be applied, including a battery management system, to prevent the overloading of the battery.
Activated carbon dust explosion	Activated carbon could cause a dust explosion in two scenarios: within the storage silo or when it is being used within the baghouse as part of the flue gas treatment. To prevent a dust explosion in the baghouse, the flue control system will have a setpoint to avoid excess dust. All equipment will be maintained to avoid creating sparks during the process. The storage silo for the activated carbon will have temperature monitoring systems and gas suppression. The gas suppression bottles will be stored sufficiently far away from the silo, to reduce the likelihood of damage in an explosion. Further hazard assessments as required by specific activated carbon storage standards like AS/NZS 4745-2012 will be carried out. The exact design of the storage silos and the operational considerations to avoid dust explosions during filling of the silos will be developed as part of the design process. The measures outlined above are considered to reduce the residual risk of a dust explosion so far as reasonably practicable.

Identified hazard	Impact assessment
Diesel spill and bund fire	Diesel is required for auxiliary burners and a back-up diesel generator. The diesel will be stored in line with AS 1940-2017 and be contained within a bunded area that can hold 110% of the capacity of the storage tank. The PHA calculated the potential heat radiation impacts if the storage silo failed and a diesel bund fire started. The heat radiation would be felt at the site boundary, and people would have to move further away from the site to avoid being impacted. Through compliance with AS 1940-2017 the offsite risk of a diesel spill or bund fire is considered sufficiently mitigated as low as reasonably practicable.
Release of ammonium hydroxide	Ammonium hydroxide is used in the Selective Non-Catalytic Reduction (SNCR) process where ammonia is injected into the boiler to reduce nitrogen oxide emissions in the combustion process. If the storage of ammonium hydroxide failed, the worst-case results show a dispersion of toxic cloud at a Short-Term Exposure Limit (STEL) of 35 parts per million (ppm) at a height of 5m as far as a kilometre downwind from the site. The likelihood of this risk occurring has been estimated using a series of conservative assumptions and is below the risk criteria set out by HIPAP 4. There is an extremely low likelihood of such an event occurring (refer to Section 4.4, 5, 6 and 7 of the PHA). The storage area will be designed in line with AS 3780-2008 and be contained within a bunded area that can hold the capacity of the storage silo. Storage silos will have real-time level sensors to monitor and recognise leaks from the control room.
Flammable atmosphere of ammonium hydroxide	Ammonia can create a flammable atmosphere. The calculations in the PHA determined that the space within the silo which the ammonia is stored is likely to always be flammable and will be classified as a hazardous area zone. The design of the storage area and nearby electrical systems will consider potential ammonia leakage and be classified as appropriate hazardous zones in line with relevant standards.
Interference with aircraft	The proposal will produce a heat plume from the stack, which has the potential to pose risks to passing aircraft. The Civil Aviation Safety Authority (CASA) completed a preliminary assessment of the proposal. The assessment concluded that the plume from the stack (about 75m high) will not infringe the Obstacle Limitation Surface (OLS) for Western Sydney Airport. Western Sydney Airport Corporation (WSA Co) was also consulted about the proposal. Discussions confirmed that the proposal plume will not intrude into the protected airspace of WSA. The stack will also be lit in line with Federal Aviation Administration guidelines. Airservices Australia and Western Sydney Airport Corporation were notified about the proposed height of the stack on 23 April 2020. An Airservices assessment was carried out for Sydney, Bankstown, Camden and Richmond aerodromes, and Westmead Hospital heliport completed on 22 May 2020. Airservices Australia stated that they have no objection to the proposed plume rise from the proposal. Odour from waste facilities has the potential to attract wildlife, increasing the risk of wildlife strike for aircraft. The National Aircraft Safeguarding Framework recommends a 13km radius of an airport as a potential risk for wildlife strikes (advised by Guideline C-Managing the Risk of Wildlife Strikes in the Vicinity of Airports). The proposal site is outside of this 13km radius. As the entire EfW process is contained within the proposed buildings, odour emissions that could potentially attract wildlife will be avoided. So, there is no increase in risk of wildlife strike from the proposal.

Identified hazard	Impact assessment
Release of FGTr (onsite)	The FGTr contains a variety of elements, heavy metals, and toxins which will be held onsite and contained within a silo. The most credible scenario for the release of FGTr onsite is a failure of the hose during transfer of the FGTr from the silo to the sealed vehicle. The tankers will securely connect to the silo via a hose connection and FGTr will be deposited from the silo into the tanker in a controlled manner. During operation, spill management procedures will be followed, and ongoing maintenance of systems would be carried out to limit failure. This will reduce the risk of this scenario having an offsite impact as low as reasonably practicable.
Release of FGTr (during transportation)	The FGTr contains a variety of elements, heavy metals, and toxins which will be transported to an offsite treatment plant. The FGTr will be transported in sealed pneumatic tankers designed in accordance with AS/NZS 1210, which will provide protection in the event of a crash. If the truck transporting the FGTr crashes, this could lead to FGTr dispersion and has the potential to adversely impact people and biodiversity. Air dispersion modelling was undertaken (Appendix F of the PHA) and the results show that even with conservative assumptions, the impacts to sensitive human receptors, even at a distance of 20m, are expected to be negligible. Spilled FGTr could impact the flora and fauna. For the FGTr to reach the Cleanaway Hazardous Bulk Treatment Facility, the trucks must cross Reedy Creek and Ropes Creek. If a crash occurs near these waterways there is a risk of FGTr impacting fauna and flora in these creeks. The proposed haulage route is the shortest route to the treatment facility, so the impact is mitigated as low as reasonably possible. The final route will be confirmed in the detailed design and will consider community submissions pre-approval and the HIPAP 11 – Route Selection study post-approval.
Transformer bund fire/explosion	The site will require an oil-filled transformer which could cause a fire or explosion risk. Transformers are used frequently for industrial activities and have well-defined standards. The proposed transformer will be designed to comply with the relevant standards, which is considered enough to mitigate any risks.

While there will be dangerous goods stored onsite which could be subject to fire, explosion, or toxic release, these dangerous goods are well-understood and there are industry standards for storing and managing these goods which will be applied as part of the proposal.

There were five hazards identified as having potential to pose significant offsite risks:

- Fire in the waste bunker
- Formation of hydrogen in IBA
- Activated carbon dust explosion
- Diesel spill and bund fire
- Release of ammonium hydroxide.

Specific measures are listed in **Section 14.6** to mitigate these hazards. The PHA concludes that the identified risks can be readily and commonly mitigated, so the proposal is not within the criteria for a hazardous industry as defined in clause 3 of SEPP33 or as described in the Applying SEPP33 Guidelines.

14.4 Assessment of potentially offensive industry

14.4.1 Construction

Construction of the proposal has the potential to discharge pollutants offsite in the form of noise, dust and surface water contamination. Assessments of these impacts in other parts of the EIS have concluded that they can be managed with standard construction environmental management measures.

14.4.2 Operation

SEPP 33 seeks to recognise and assess whether a proposed development for the purpose of industry or storage is potentially offensive.

The Applying SEPP 33 Guidelines note that the permissibility of a proposal to which the policy applies is linked to its pollution control performance, and the merits of proposals should be properly assessed in terms of offence caused by pollution before being determined. The SEPP 33 Guidelines also note that potentially offensive industry, as defined earlier, could be regarded as development that would need a pollution control licence (EPL). If the licence conditions could not be met, the proposed development would be considered offensive and would not normally be permissible. Conversely, if the proposal could meet licence conditions, it would normally be permissible.

The proposal will have to receive an EPL. The scope of matters likely to be regulated by the EPL includes:

- Air quality and odour
- Noise
- Waste
- Water quality
- Contamination.

Table 14.3 summarises the environmental impacts of the known matters drawing on other assessments in the EIS, to demonstrate that the proposal can operate within impact assessment criteria and can be regulated by an EPL.

Table 14.3: Environmental matters likely to be regulated by an EPL

Matter	Assessments	Summary of impact assessment
Odour	Technical report A: Air Quality and Odour Assessment Report	The facility will receive putrescible waste which has the potential to generate odour. The design of the facility will minimise the release of odour by enclosing the waste receival hall and using fast-acting roller shutter doors for vehicle access. The facility will be developed with several pollution control systems, including using an inward pressure gradient for the tipping hall and waste bunker which causes air to be drawn into the combustion process. When boilers are not operating, a filtration system in the receival hall will be used to manage odour. The advanced flue gas treatment systems will also be used to prevent the flue gas from causing adverse odour or pollution impacts. An assessment of the potential impacts on air quality and odour is included in **Chapter 8 Air quality and odour** and **Technical report A Air quality and odour assessment report**. The results indicate that odour levels due to the proposal will be at or below the applied odour assessment criteria at all assessed receptors.
Air quality	Technical report A: Air Quality and Odour Assessment Report	All predicted impacts associated with emissions from the proposal are within the applicable emission limit values and impact assessment criteria, apart from cumulative ground level PM2.5 and PM10 concentrations, due to the existing background levels which already exceed the criteria (as occurs across much of New South Wales). Where background levels already exceed criteria, the EPA's approved methods allow for an alternative assessment approach which considers the change in the number of days when an exceedance is recorded as a result of the proposal. The assessment concluded that the proposal would not increase the number of days for which exceedances would be recorded for PM2.5 and PM10 concentrations, and that impacts would not be discernible or measurable.

Matter	Assessments	Summary of impact assessment
Contamination	Technical report G: Detailed Site Investigation Technical report G2: Remediation Action Plan	The Detailed Site Investigation (DSI) (**Technical report G**) found elevated levels of some contaminants on the proposal site. A Remediation Action Plan (RAP) has been prepared and will be carried out to manage recognised soil contamination. RAP outlines additional investigations, monitoring of soil gas and water, and talks about unexpected finds during future civil and construction works.
Waste management (handling, storage, transport)	Chapter 3 EfW policy	The proposal will receive waste as a feedstock for thermal treatment in the EfW process. The EPL will regulate how waste is handled, stored and processed, to minimise harm to human health and the environment. The EfW process will generate residual waste streams – Incinerator Bottom Ash (IBA), Boiler Fly Ash (BFA) and Flue Gas Treatment Residue (FGTr). IBA will be transported to an offsite location for storage and processing under a separate development application and EPL as described in **Chapter 22 Related development**. BFA and FGTr will be treated at an existing offsite facility before being disposed at a licensed facility as discussed in **Table 14.2** above.
Pollution to water	Technical report F Soils and Water Assessment Report and Technical report H Hydrology and Flooding Assessment Report	The proposal will have reticulated sewer systems, and stormwater drainage will be directed to the local surface water system. The proposal does not pose an unacceptable risk to groundwater quality, subject to standard pollution prevention measures. The proposal has been assessed against Blacktown City Council water quality pollutant reduction targets. The proposal will meet these targets, through the incorporation of rainwater harvesting, gross pollutant traps, bioretention and revegetation of the overland flow path.
Noise	Technical report I Noise and Vibration Impact Assessment	Noise and vibration will be generated during the operation of the proposal. **Technical report I Noise and Vibration Impact Assessment** concludes that the proposal can be designed to comply with all noise criteria. Similarly, design-embedded measures will be incorporated to avoid vibration impacts.

Based on the assessment in **Table 14.3**, the proposal is not considered an offensive industry as there are safeguards and mitigation controls in place to meet the requirements of the EPL. The proposal will not have a significant adverse impact in the locality, or on the existing or likely future development on other land in the locality, and as such does not result in a significant level of offence.

14.5 SEPP 33 – matters for consideration

In determining an application to carry out development to which SEPP 33 applies, the consent authority must consider the criteria in Clause 13 of SEPP 33.

Table 14.4 presents an assessment of the criteria in Clause 13 of SEPP 33.

Table 14.4: Assessment of SEPP 33 Clause 13 criteria

Criteria	Assessment
(a) current circulars or guidelines published by the Department of Planning relating to hazardous or offensive development	The following guidelines were used for the PHA: • Applying SEPP 33 – Hazardous and Offensive Development Application Guidelines (Applying SEPP 33) (DoP, 2011) • Multi-level Risk Assessment, Assessment Guideline (DPI, 2011) • Hazardous Industry Planning Advisory Paper (HIPAP) No. 4, Risk Criteria for Land Use Safety Planning (DoP, 2011) • HIPAP No. 6, Hazard Analysis (DoP, 2011)
(b) whether any public authority should be consulted concerning any environmental and land use safety requirements with which the development should comply	The following authorities have been consulted in about environment and land use safety: • Blacktown Council • Fairfield Council • Western Sydney Parklands Trust • Fire and Rescue NSW • Environment Protection Authority • SafeWork NSW • CASA • Western Sydney Airport • Airservices Australia.
(c) in the case of development for the purpose of a potentially hazardous industry—a preliminary hazard analysis prepared by or on behalf of the applicant	A PHA has been prepared (**Technical report J**).
(d) any feasible alternatives to the carrying out of the development and the reasons for choosing the development the subject of the application (including any feasible alternatives for the location of the development and the reasons for choosing the location the subject of the application)	**Section 2.6** of **Chapter 2 Strategic context** considers the alternatives of the proposal.

Criteria	Assessment
(e) any likely future use of the land surrounding the development	The proposal site is adjacent to existing and disused waste management facilities to the north and east, transport infrastructure and industrial activities to the west and water infrastructure and industrial activities to the south. There is unlikely to be any development to the north of the proposal site on the disused landfill. Residential development is prohibited in WSP, so there is unlikely to be residential encroachment near the proposal site. The WSP Plan of Management indicates the future land uses for the area which are likely to be industrial in nature, such as recycling and renewable energy facilities, consistent with the EfW facility.

14.6 Mitigation

The hazards and risks associated with EfW facilities are well-known and this allows for them to be readily recognised and mitigated against. The mitigation for hazards and risks are typically managed by complying with the relevant standards of design for individual systems, goods, and processes. Mitigation measures relating to pollutants which may cause offence are covered in each of the relevant assessment chapters and technical papers. The following specific mitigation measures are recommended for this proposal.

Table 14.5: Hazard and risk mitigation measures

ID	Impact/Risk	Mitigation
Construction		
HR1	Construction risks	The CEMP will include details of how to manage construction related risks, including spills, incidents and transportation risks.
Operation		
HR2	Fire in tipping hall and waste bunker	Install fire detection and suppression systems in both the tipping hall and waste bunker. The final waste bunker fire safety design shall be developed through an appropriate fire engineering process.
HR3	Dust explosion	A facility-wide vacuum cleaning system will be installed to reduce the likelihood of dust build-up in the tipping hall.
HR4	Phosphine and hydrogen explosion	The ventilation of the IBA will be sufficient to prevent the building up of hydrogen into an explosive atmosphere. The IBA area will also have hydrogen gas sensors with alarm set points below the lower flammability limit.
HR5	Acid and base reaction	Acids and bases will be stored in line with AS 3780-2008, and in line with obligations under section 5 of Chapter 7 of the *Work Health and Safety Regulation 2011*.

ID	Impact/Risk	Mitigation
HR6		Ammonium hydroxide and sodium hydroxide will not be stored in the same bunded area or in compounds that share a common drainage system as per section 6.3 of AS/NZS 3833-2017.
HR7	Dust explosion (activated carbon)	The activated carbon storage area will be zoned in line with AS/NZS 60079.10.2-2016. A Hazard Assessment as outlined in section 3 of AS/NZS 4745-2012 will be carried out during the design phase.
HR8	Diesel spill and bund fire	The storage of diesel will be designed in line with EPA's Bunding and Spill Management guidelines and AS 1940-2017. It will be contained within a bunded area that can hold the capacity of the diesel storage silo.
HR9	Release of ammonium hydroxide	The ammonium hydroxide silos will have level sensors with real-time monitoring to recognise leaks quickly from the control room.
HR10		Notification and evacuation procedures will be developed and included in an emergency plan as part of the OEMP, if there is a significant release of ammonium hydroxide.
HR11	Emergency plans	The site managers will develop an emergency response plan which includes coordination with local response organisations, such as Fire and Rescue NSW and NSW Ambulance services. The emergency response plan would include, but not be limited to, the following: • Emergency procedures • Evacuation procedures • Roles and responsibilities and contact details of emergency contacts • Equipment necessary to rectify the emergency • Details of hazardous materials stored onsite • Medical treatment advice.
HR12	Aircraft collision	The stack will be lit in line with Chapters 5 and 6 of the Federal Aviation Administration's (FAA) AC 70/7460-1L: Obstruction Marking and Lighting.
HR13	Hazardous or offensive impacts	The proposal will be subject to an EPL and conditions of consent, that will further regulate the proposal to manage potentially hazardous or potentially offensive impacts.

Chapter 15

Traffic and transport

15 Traffic and transport

15.1 Introduction

This chapter outlines the traffic and transport impacts from the construction and operation of the proposal. A Traffic and Transport Assessment has been prepared and is included as **Technical Report K**.

The methodology for completing the Traffic and Transport Assessment included:

- Investigating the existing transport network near the proposal
- Carrying out a quantitative assessment of the vehicle generation of the proposal in construction and operation
- Assessing the potential impacts of the proposal on the road network, including traffic modelling of intersections directly affected by the proposal
- Setting up mitigation measures to manage the traffic impacts and encourage sustainable travel patterns.

The traffic and transport assessment has been prepared in line with the following standards and guidelines:

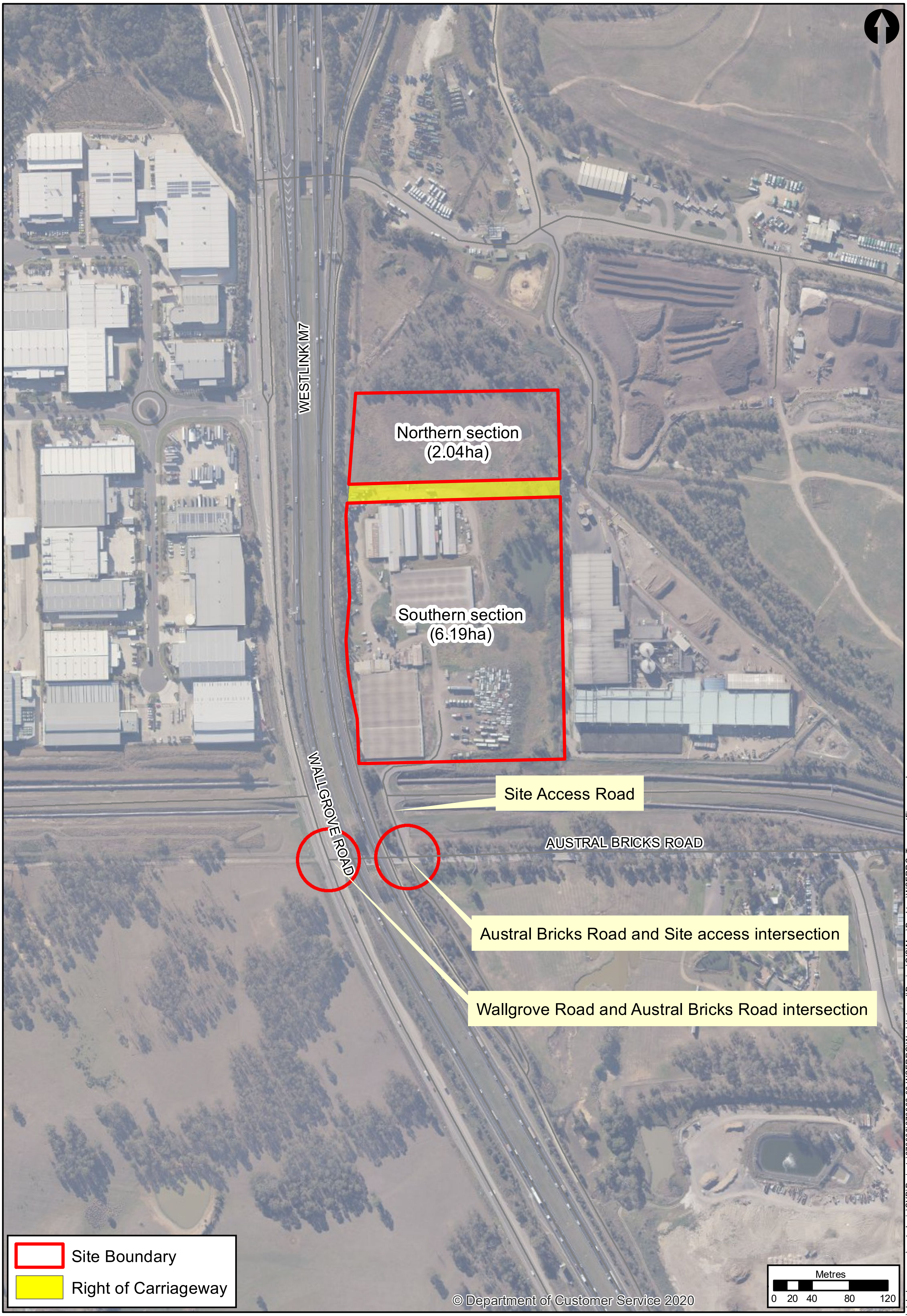
- Guide to Traffic Generating Development (Roads and Traffic Authority, 2002)
- Guide to Traffic Management Part 12: Traffic Impacts of Developments (Austroads, 2009)
- Traffic Modelling Guidelines (NSW Roads and Maritime Services, 2013)
- Road Design Guide (Roads and Traffic Authority, 1988).
- NSW Freight and Ports Plan 2018–2023 (Transport for NSW, 2018).

15.2 Existing environment

15.2.1 Site access and surrounding transport network

Figure 15.1 below shows the site access and surrounding road network.

The site is located north of an unnamed road, referred to in this EIS as the Austral Bricks Road. The site is currently accessed from a site access road and a give-way intersection with Austral Bricks Road. Austral Bricks Road travels east-west, connecting to Wallgrove Road at its western end. Wallgrove Road is a major distributor which connects to larger arterial routes, such as the Westlink M7 Motorway (the M7) which adjoins the proposal's western boundary.



Service Credits: DFSI, 2020

© Arup 2020

Figure 15.1: Existing site access and the surrounding road network

The M7 shared path (cycle and pedestrian) is located adjacent to the western perimeter of the site and connects to Austral Bricks Road. This shared path is separated from road traffic and extends almost the entire length of the M7, from Campbelltown to Kings Langley.

Bus stops are located on Wallgrove Road north of the intersection with Austral Bricks Road. The bus stops accommodate bus routes 738 and 835 which run every 30 minutes in peak hours. Bus 738 runs from Mount Druitt and Rooty Hill to Eastern Creek and Horsley Drive. Bus 835 runs from Prairiewood to the Western Sydney University.

15.2.2 Existing vehicle traffic from the site

Baseline surveys of vehicle traffic movements were carried out in July 2019 at the intersection between Austral Bricks Road and the site access. The results indicate that there are about 70 two-way movements from the site daily. The site was used for miscellaneous industrial uses at the time. Most vehicles accessing the site were heavy goods vehicles (HGV), and there is enough clearance under the M7 for HGVs.

15.2.3 Future environment

The site is within the Western Sydney Parklands (WSP), with the Western Sydney Employment Area (WSEA) located west of the M7. The WSEA has been heavily developed in the last five years, with a growth in warehousing and logistics attracted by the proximity to the M7 and M4. The NSW Government is currently considering a proposal to rezone the Mamre Road Precinct for inclusion in WSEA with a focus on warehousing and logistics. This will see a further increase in heavy-vehicle traffic, once developed.

In 2014, plans for a Southern Link Road were announced, comprising an east-west arterial link from Wallgrove Road and Mamre Road. However, based on recent advice from Transport for New South Wales (TfNSW), the alignment for the Southern Link Road is not confirmed, and a potential alignment could connect to the Wallgrove Road and Austral Bricks Road intersection.

A staged State Significant Development (SSD) proposed by Gazcorp Industrial Estate was approved in 2019. The proposal is for an industrial warehouse estate at 813–913 Wallgrove Road. Stage 1 of the proposal is expected to generate 157 peak-hour trips, with this increasing to 600, once the Concept Proposal is complete. This application is relevant to the proposal as it proposes to signalise, widen and add an approach to the Wallgrove Road and Austral Bricks Road intersection.

This proposed arrangement is used when assessing the potential intersection impacts for the WSERRC. Assessing this arrangement represents a worst-case scenario as it considers the additional traffic relating to the Gazcorp Industrial Estate project.

If waste feedstock comes from the Erskine Park Waste Transfer Station to WSERRC, vehicles accessing the site will travel via Lenore Drive / Old Wallgrove Road (also known as the Erskine Park Link Road) which has undergone significant recent improvements.

TfNSW also has plans to upgrade Mamre Road, including the provision of two lanes in each direction, shared bicycle and pedestrian facilities and several new signalised intersections.

15.3 Assessment

This section outlines the potential traffic and transport impacts in construction and operation of the proposal. The assessment considers the traffic generation, intersection impacts and parking impacts.

The SEARs require an assessment of traffic impacts on main intersections, specifically the intersection of Wallgrove Road and Austral Bricks Road. Detailed designs have not yet been approved for the Gazcorp Industrial Estate upgrades to the Wallgrove Road / Austral Bricks Road intersection. However, the traffic assessment has been modelled based on a schematic design for the 2021 scenario included in the Gazcorp Industrial Estate development application documents. SIDRA modelling software was used to assess the intersection impacts.

15.3.1 Construction impacts

Traffic generation

A Construction Traffic Management Plan (CTMP) is included as Appendix A of the **Technical Report K Traffic and Transport Assessment Report**. This CTMP outlines the predicted construction vehicles and worker numbers needed onsite throughout the construction period. These construction traffic predictions are summarised below:

- The peak daily construction vehicle movements are estimated to be 75 two-way per day. It is estimated that there will be 7 two-way construction vehicle movements per hour.
- It is estimated that the proposal will create 900 direct construction jobs over the 3-year construction period. The peak number of workers likely to be onsite over construction would be 600 a day.

- It is assumed that 25% of workers would carshare or arrive to the site in construction vehicles, so construction workers would contribute an additional 450 vehicle trips inbound in the morning period and outbound in the afternoon period.
- Given the standard construction hours are 07:00 to 18:00 Monday to Friday, 50% of workers are expected to arrive in the first hour of the site opening (07:00 to 08:00), and 25% of workers are expected to arrive in the shoulder hours either side of this peak time. In the afternoon period, it is expected that workers would leave between 15:00 and 19:00, so worker vehicle trips are distributed across these timeframes.

Figure 15.2 shows the peak construction daily traffic profile.

Figure 15.2: Daily traffic profile during construction of the proposal

Intersection impacts

The above traffic generation assumptions have been used to model impacts on the nearest intersections. It is assumed that all construction vehicles will use the Wallgrove Road and Austral Bricks Road intersection. Modelling has been completed to compare the proposal construction traffic with the Gazcorp Industrial Estate 2021 intersection layouts. **Table 15.1** shows the results.

The average delay refers to the time vehicles can expect to wait at an intersection. The Level of Service is an index used in the SIDRA model to determine the operational performance of traffic at an intersection. An A Level of Service represents the best operating conditions from the traveller’s perspective and an F Level of Service is the worst.

Table 15.1: Wallgrove Road / Austral Bricks Road intersection – construction traffic modelling

Scenario		Total intersection		Austral Bricks approach	
		Average delay (s)	Level of Service	Average delay (s)	95 percentile queue length (m)
2021 Gazcorp intersection	AM	37.4	C	70.3	19
	PM	36.5	C	55.9	24
2021 Gazcorp intersection with the WSERRC construction traffic	AM	36.6	C	72.4	26
	PM	37.7	C	69.0	72

The modelling results show that despite the increase of traffic in both morning and evening periods, an overall Level of Service C is maintained for the intersection. In the morning period, the construction traffic will cause a 7m increase in queue length and a small increase in average delay. The average delay at the intersection decreases because the increased number of vehicles turning left into Austral Bricks Road. In the evening, the average delay and queue length increases on the Austral Bricks Road approach. This impact would only occur in the peak construction period which is three months duration. Throughout the remaining construction programme, there would be fewer workers needed, and therefore less queuing on the Austral Bricks Road. To reduce this queue length and delay time, construction vehicles could be encouraged to turn left instead of right onto Wallgrove Road.

The SIDRA model was used to compare the impacts of the construction vehicle traffic with the existing give-way intersection between the site access and Austral Bricks Road. Construction traffic would turn right onto Austral Bricks Road. **Table 15.2** shows the results.

Table 15.2: Austral Bricks Road / site access intersection – construction traffic modelling

Scenario	Average delay (s)	Level of Service
AM peak hour (09:00 to 10:00)	2.8	A
PM peak hour (17:00 to 18:00)	4.7	A

The results show that the existing give-way arrangement has enough capacity to accommodate the expected construction traffic morning and evening peaks. The same level of service is maintained.

Parking impacts

All construction and construction worker vehicles will be able to park within the proposal site. It is expected that most of the construction and construction worker vehicles will park in the northern section of the site on existing hardstand. Therefore, no offsite parking impacts are anticipated.

15.3.2 Operation impacts

Traffic generation

Once the proposal is operational, traffic would be generated by waste vehicles and employee and visitor vehicles. Various service vehicles would be needed to support the operation of the proposal, including heavy vehicles to deliver waste feedstock to the site. The estimated number of vehicle movements for each individual service vehicle is available in **Section 4.1** of **Technical Report K Traffic and Transport Assessment Report**.

The proposal is expected to need a total of 188 two-way waste vehicle trips per day. The peak hour servicing vehicle demand would be 29 vehicles from 12:00 to 13:00.

About 30 employees will be needed onsite in normal operating times. Most staff will work standard hours, so it is assumed 50% will arrive between 08:00 and 09:00 and depart between 17:00 and 18:00, with 25% arriving in the shoulder hours either side of these peak times.

The visitor and education centre and contractors visiting the site are expected to contribute up to two trips an hour between 08:00 and 17:00. Most of these trips will be made by car, and a small number would be coaches taking groups to the visitor and education centre.

Based on the above estimates, the overall daily vehicle trips from staff and visitors would be 48 two-way trips.

Combining the waste vehicles and employee and visitor vehicle trips, 236 two-way trips would be generated by the proposal each day. **Figure 15.3** below shows the demand profile for the traffic generation. The peak hour is between 09:00 and 10:00, with 33 vehicles arriving to the site.

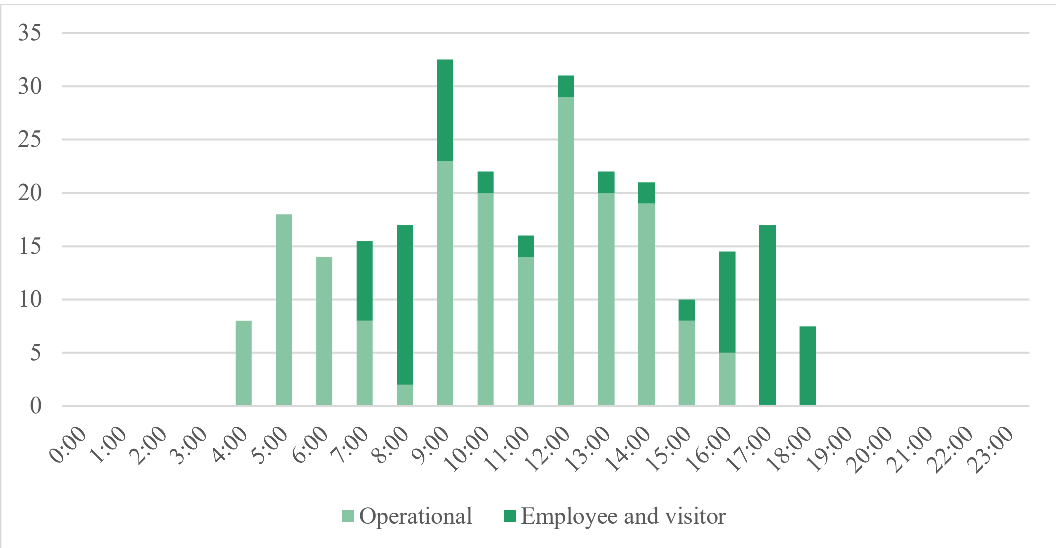


Figure 15.3: Daily traffic generation during operation of the proposal

Network impacts

The above traffic generation assumptions have been used to model impacts on the nearest intersections. **Table 15.3** shows the model results on the Wallgrove Road and Austral Bricks Road intersection.

Table 15.3: Wallgrove Road / Austral Bricks intersection – operation traffic modelling

Scenario		Total intersection		Austral Bricks approach	
		Average delay (s)	Level of Service	Average delay (s)	Queue length (m)
2021 Gazcorp	AM	37.4	C	70.3	19
	PM	36.5	C	55.9	24
2021 Gazcorp with the WSERRC operation traffic	AM	37.3	C	70.3	19
	PM	36.6	C	57.2	34

The modelling shows the average delay decreases slightly in the morning period because of the addition of vehicles turning left into Austral Bricks Road. There is no change to delay time or queue length expected on the Austral Bricks Road approach in the morning period. In the evening period, queuing would increase by 10m on the Austral Bricks Road approach to the intersection. Overall, the same Level of Service (C) is still maintained for the intersection.

The model was used to compare the impacts of the operational vehicle traffic with the existing give-way intersection between the site access and Austral Bricks Road. **Table 15.4** shows the results.

Table 15.4: Austral Bricks / site access intersection – operation traffic modelling

Scenario	Average delay (s)	Level of Service
AM peak hour (09:00 to 10:00)	1.1	A
PM peak hour (17:00 to 18:00)	3.2	A

The results show that even with the operational traffic from the proposal, the intersection would maintain a high Level of Service (A).

A swept path analysis and safe intersection distance analysis have been carried out of the proposed vehicle movements from the site access road to Austral Bricks Road (see Appendix B of **Technical report K**). The results show that the intersection can accommodate the proposed vehicle movements, ensuring the safety of the road network is maintained.

Service vehicle routes

It has been assumed that about 50% of the feedstock waste deliveries will originate from the Cleanaway Erskine Park Waste Transfer Station (85–87 Quarry Road, Erskine Park). The expected route between this facility and the proposal site would be via Erskine Road, Lenore Drive and Old Wallgrove Road as shown on **Figure 15.4**. All these roads can accommodate HGV movements, and there is enough clearance under the M7 for HGVs.

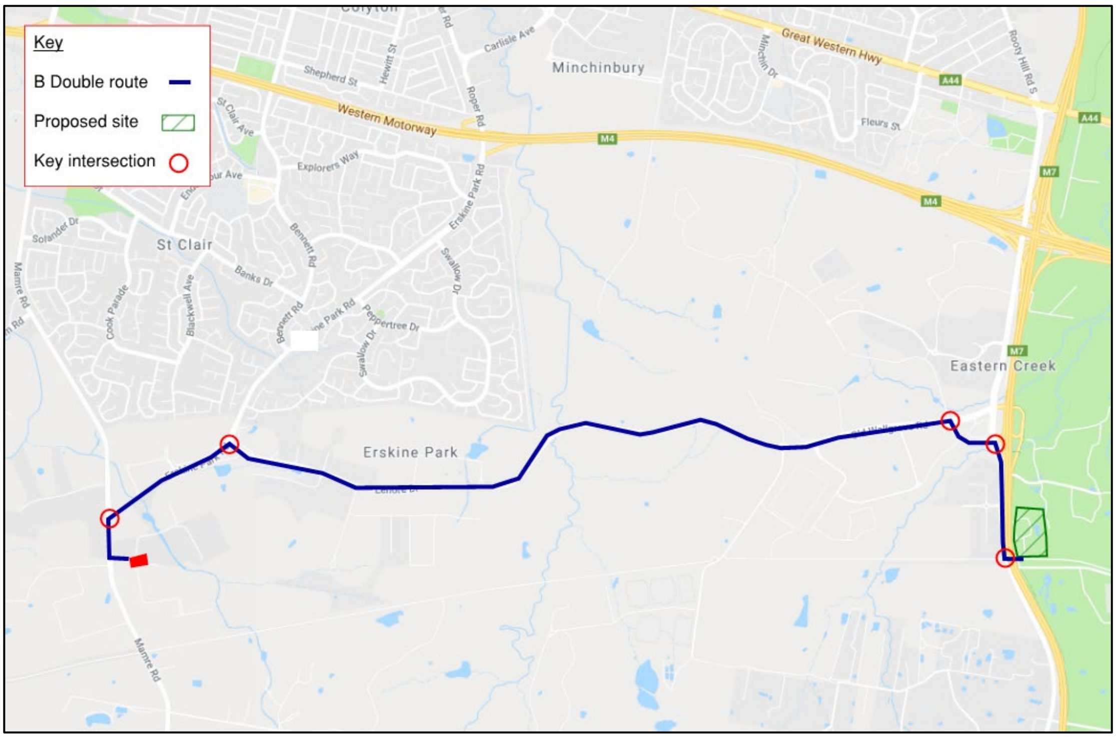


Figure 15.4: Indicative route for residual waste from the Cleanaway Erskine Park Waste Transfer Station

The remaining 50% of feedstock waste deliveries will come from a variety of locations but are likely to use similar routes along main roads capable of accommodating HGV movements.

Flue gas treatment residues (FGTr) will be transported offsite to be treated at the Cleanaway Hazardous Solid Treatment Facility (40 Christie Street, St Marys) and disposed of at a licensed landfill such as the SUEZ Kemps Creek Landfill (1725 Elizabeth Drive, Kemps Creek), which has been assumed for the purpose of the traffic assessment. The proposed route complies with the requirements for HGV routes under the NSW Heavy Vehicle Access Policy Framework (TfNSW, 2018).

Incinerator Bottom Ash (IBA) is produced as a waste by-product from the EfW combustion process. IBA is an inert by-product which contains ferrous and non-ferrous metals. The WSERRC will include a ferrous metal separator onsite to recover large ferrous metals from the IBA for recycling and sale to market.

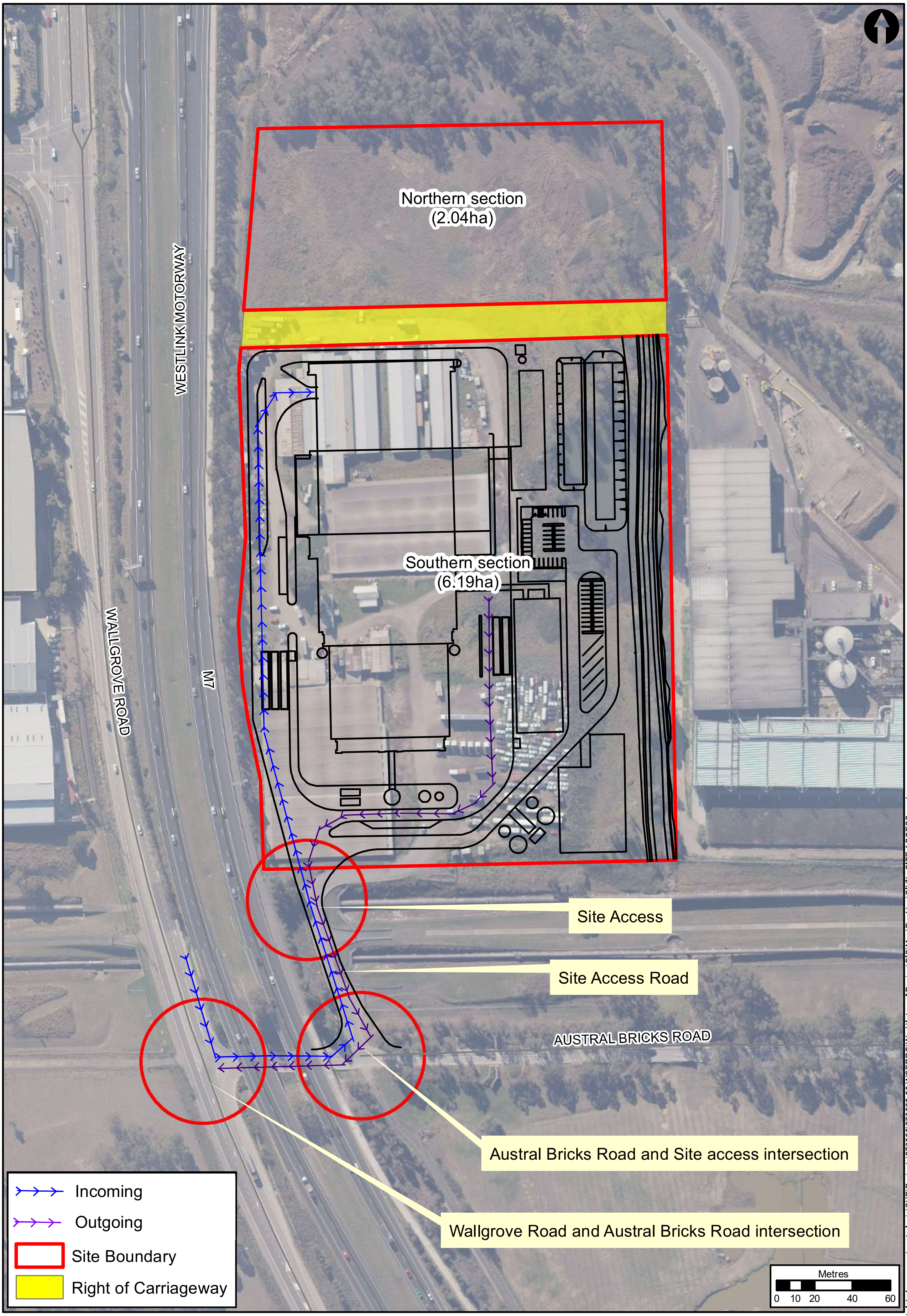
The remaining IBA may be transported to a dedicated IBA storage, treatment, metal recovery and maturation facility where non-ferrous metals (or secondary metals) recovery may be carried out. The IBA facility, if progressed, will be subject to a separate development application process. However, the site location for storage and/or treatment has not been finalised at this stage. It is anticipated that any vehicle routes for the transport of IBA will be capable of handling HGVs.

It is noted that part of the boiler fly ash stream is captured with the IBA and part of the boiler fly ash stream is captured with the FGTr and transported for disposal according to the ash type it is collected with, as noted above.

The types of material to be transported to and from the site are covered in **Chapter 14 Hazard and risk**.

Site access

Access to the site is via an existing access off Austral Bricks Road which crosses over the Warragamba pipelines corridor and into the proposal site. This existing site access will need to be upgraded to accommodate the proposals traffic movements. These site access works and any corresponding road upgrades are related development and will be assessed and determined through separate approval processes (refer to **Chapter 22 Related development**). **Figure 15.5** shows how vehicles would access the site.



\\global.arup.com\australasia\SYD\Projects\273000\273862-00 WSERRC\Work\Internal\Design\GIS\Map\Desktop\CIVIL_SITE ACCESS.mxd

Service Credits: DFSI, 2020

Figure 15.5: Route for vehicle access to the site

Alternative access arrangements and alternative site layouts were considered for this proposal which is discussed in **Section 2.6.7** of **Chapter 2 Strategic context**. The site layout option chosen maximises the space between the site entry and the waste receiving hall where trucks tip their waste. This layout was chosen because it means there is enough space for internal truck queuing, reducing the impact on public roads and intersections. The proposed site layout is shown in **Figure 15.6**.

All vehicles will enter the site from the access proposed at the southern boundary. The existing access will be upgraded to accommodate two-way B-double type heavy vehicle movements and will be designed to comply with the relevant Australian Standards. A vehicle swept analysis of the proposed access has been completed using expected design vehicles, including B-doubles. It is included in Appendix B of **Technical Report K**.

Traffic routes onsite

Figure 15.6 shows the different traffic routes used on site.

Staff and visitor vehicles would be directed to turn right to access the car park, the office and the visitor and education centre. This road is separated from the route for service vehicles for safety and to reduce the likelihood of conflicts with servicing vehicles.

Separate paved pedestrian and cycling routes will be arranged to the office and the visitor and education centre.

Service vehicles (all heavy vehicles carrying waste delivery, consumables and residues) will follow a one-way circular system in a clockwise direction. There will be no onsite heavy vehicle parking, rather vehicles will follow the circulation loop and queue within the site where necessary. Vehicles with incoming waste will be weighed at one of the three weighbridges proposed at the entrance to the facility. It is estimated it will take about two minutes for any truck to be weighed. The facility would be able to process about 90 incoming servicing vehicles in an hour. The capacity and location of the weighbridges would be good enough to manage the influx of vehicles without queuing onto Austral Bricks Road.

The design allows appropriate width for emergency vehicles to circulate around the main building of the facility to access various parts of the site. When an emergency vehicle needs access, other vehicles within the site will be directed to areas where they would not obstruct the circulation route for emergency vehicles. Because of the nature and size of the activity, no specific emergency vehicle parking is available as they may need to access a range of locations.
The circulation loop allows for this.

Figure 15.6: Traffic routes on site

Parking

The proposal will include the following car parking onsite:

- 40 staff car parking spaces
- 10 visitor/contractor parking spaces
- 4 coach bays.

These parking provisions meet the Blacktown City Council Development Control Plan 2015 requirements and are considered sufficient for all staff, visitors and contractors to park within the site and to avoid offsite parking impacts.

Sustainable and active transport

As outlined above in **Section 15.2.1**, public transport bus routes are located across Wallgrove Road and the M7 shared cycle path is located adjacent to the western perimeter of the site.

Direct bike and walking path linkages to other areas of the Western Sydney Parklands (WSP) have not been made available to this stage of the design mostly for safety reasons, because of the industrial nature of operational activities to occur on the site. The location of the site on the western perimeter of the Parklands avoids impact on the main north-south circulation and access network that runs through the Parklands. The site is in the Wallgrove Precinct which comprises services land and industrial facilities not accessible to the public.
The main walking and cycling routes through the WSP are located east of the site, with the M7 cycle track located adjacent to the western perimeter of the site. However, although direct path linkages through the site have not been made available to this stage of the design, the proposal has incorporated a visitor and education centre which will encourage visitors to the WSP.

Further, enough cycle parking and end-of-trip facilities will be arranged within the office component of the site. The proposal will include 15 cycle parking spaces and end-of-trip facilities for staff. The 15 cycle parking spaces are considered adequate for a demand of 50% of full-time equivalent employees cycling to work each day. This will support employees wishing to travel to the site via bicycle, who can use the M7 shared path to access the site safely.

Information will also be issued as part of the Green Travel Plan to improve awareness of the surrounding cycling routes. The site layout will have a paved path connecting from the entrance to the visitor and education centre, so pedestrians and cyclists can access the proposal site safely.

15.4 Mitigation

Table 15.5 describes the measures that would be applied to mitigate against, manage and monitor the predicted traffic and transport impacts.

Table 15.5: Traffic and transport mitigation measures

ID	Impact	Proposed mitigation
Design embedded mitigation measures		
TT1	Queuing onto the road network	The number of weighbridges and their location on the site is sufficient to avoid queuing onto the road network.
TT2	Safety risks	The site layout has been designed so that staff and visitor vehicles are separated from heavy vehicles.
TT3	Traffic generation	The proposal includes end-of-trip facilities and bicycle parking, to encourage sustainable transport to the site.
Construction mitigation measures		
TT4	Road network / traffic generation	A Draft Construction Traffic Management Plan (CTMP) (Appendix A of **Technical report K**) has been prepared and includes measures to reduce construction traffic such as adjusting shift patterns, encouraging car sharing and making workers aware of other transport options. This CTMP, as part of the Construction Environment Management Plan (CEMP), will be updated once a contractor is appointed.
Operation mitigation measures		
TT5	Road network / traffic generation	A Green Travel Plan will be prepared and carried out to inform employees on sustainable travel modes and will include measures to support these initiatives. A member of staff will be appointed as the Green Travel Plan coordinator tasked with carrying out and updating the plan.
TT6	Road network / traffic generation	The site will offer designated car parking spaces for carshare use to encourage staff to carshare.
TT7	Road network / traffic generation	Most visitor travel to the visitor and education centre will be via coaches, to minimise additional traffic generation.

Chapter 16

Landscape and visual

16 Landscape and visual

16.1 Introduction

This chapter summarises the landscape and visual impacts associated with the proposal's construction and operation. A Landscape and Visual Impact Assessment (LVIA) has been prepared and included as **Technical report L**.

The methodology for the LVIA included:

- Gaining a clear understanding the existing environment that may be impacted by the proposal, by recognising the landscape character of the proposal site and the surrounding area and representative locations from which the proposal may be visible. This involved a review of the relevant legislation and policies and an analysis of local landscape features.
- Assessing the impacts of the proposal on the existing landscape character and representative views by:
  - Completing a landscape assessment on seven landscape character areas, assessing the sensitivity of the receiving environment and the magnitude of change to determine the overall impact
  - Completing a visual assessment of 15 viewpoints, assessing the sensitivity of the receiving environment and the magnitude of change to determine the overall impact from construction and operation of the proposal
  - An assessment of night-time lighting impacts
  - An overshadowing analysis
- Developing measures to mitigate landscape and visual impacts, including working with the design team to embed measures into the proposal design.

The LVIA has been prepared following the below guidelines:

- NSW Roads and Maritime Services Practice Note – Guideline for Landscape Character and Visual Impact assessment EIA-N04 (2018)
- The Guidance for Landscape and Visual Impact Assessment, Third Edition, 2013, prepared by the Landscape Institute and Institute of Environmental Management and Assessment, UK
- UK's Guidance Notes for the Reduction of Obtrusive Light GN01:2011, Institution of Lighting Professionals.

16.2 Existing environment

16.2.1 Landscape overview

The proposal site is located in the Wallgrove Precinct of the Western Sydney Parklands (WSP) Plan of Management. The area immediately surrounding the site is characterised by commercial, industrial and transport infrastructure land uses, set within a wider landscape of the Western Sydney Parklands (WSP) to the north, south and east. The site is bounded by the Westlink M7 Motorway to the west, with the Eastern Creek industrial area located farther west. The SUEZ Eastern Creek Waste Management Centre, comprising the now-closed landfill site and operational organics recycling facility, is located to the north and north-east, with the operational Global Renewables waste management facility located immediately to the east. To the south, the site is bounded by the Warragamba Pipeline Corridor, with the Austral Bricks facility located farther south. The site was previously used as a poultry farm, and disused sheds and ancillary buildings are still occupying the site. The characteristics of the site hold limited landscape value other than the aesthetic amenity of the remnant woodland.

The site is screened and removed from residential and other sensitive areas, which reduces its zone of visual influence. This was one of the main factors in selecting the site. The nearest residential areas are located at least 1km away to the south. The closest receivers are road users traveling along the M7 Motorway, recreational users along the shared path adjacent to the western boundary of the site and to a lesser extent people working at the nearby commercial facilities.

16.2.2 Topography

The site is gently sloping from the south west to the north-east to an overland flow path along the eastern boundary. The topography in and around the study area is mostly influenced by the low-lying open landscape of the Cumberland Plain.

16.2.3 Vegetation

The site has undergone high levels of disturbance due to historical land clearing and adjacent industrial land uses, so the biodiversity values are limited to regenerating Cumberland Plain Woodland in the northeast of the site and existing aquatic environments (the farm dam and overland flow path). Exotic grassland is scattered across the site, and sedge community (aquatic grass) associated with the farm dam is located near the eastern boundary.

16.3 Assessment

16.3.1 Assessment method

The LVIA considers two separate impacts:

- Landscape impacts – the assessment of impact on the area's built, natural and cultural character or sense of place[1]
- Visual impacts – the assessment of impact on views.[2]

The assessment considers the sensitivity of the receiving environment and the magnitude of change to determine the overall impact from the proposal.

Sensitivity is '*the sensitivity of a landscape character zone or view and its capacity to absorb change of the nature of the proposal. In the case of visual impact this also relates to the type of viewer and number of viewers.'*[3]

Magnitude of change is '*the measurement of the scale, form and character of a development proposal when compared to the existing condition. In the case of visual assessment this also relates to how far the proposal is from the viewer.'*[4]

Sensitivity and magnitude are combined to arrive at an overall impact rating of negligible, low, moderate-low, moderate, high-moderate, or high, as shown in the table below.

Where sensitivity or magnitude can't be recognised using objective measures, professional expertise is used to make assessments about sensitivity and magnitude of a proposal.

Table 16.1: Landscape and visual impact assessment matrix

	Magnitude				
Sensitivity		High	Moderate	Low	Negligible
	High	High	High-Moderate	Moderate	Negligible
	Moderate	High-Moderate	Moderate	Moderate-Low	Negligible
	Low	Moderate	Moderate-Low	Low	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

[1] RMS, 2018.
[2] RMS, 2018.
[3] RMS, 2018.
[4] RMS, 2018.

The visual assessment also considers the impacts of proposal lighting on the environment. The same matrix applies for lighting impacts, with the sensitivity depending on the existing level of brightness of the surrounding viewpoint (intrinsically dark, low brightness, medium brightness and high brightness).

Table 16.2: Lighting impact assessment matrix

	Magnitude				
		High	Moderate	Low	Negligible
Sensitivity	High (Intrinsically dark)	High	High-Moderate	Moderate	Negligible
	Moderate (Low brightness)	High-Moderate	Moderate	Moderate-Low	Negligible
	Low (Medium brightness)	Moderate	Moderate-Low	Low	Negligible
	Negligible (High brightness)	Negligible	Negligible	Negligible	Negligible

An overshadowing analysis is also completed, which models the potential overshadowing from the proposal on the adjacent environment.

Visual privacy impacts have not been assessed in the LVIA, as the proposal is located within an existing industrial and commercial area away from residential receivers. So, any visual privacy impacts are negligible. Further to this, there are no habitable rooms on the western, northern and southern sides of the building, so no overlooking from these elevations. The operations rooms, administration areas and visitor and education centre are positioned on the eastern side of the building and overlook the landscaped areas of the site.

The Architectural and Landscape Design Strategy Report (**Appendix B**) details the proposed building height, stack height, bulk and scale all of which have been considered when completing the landscape character and visual impact assessment.

16.3.1.1 Landscape impact assessment

Landscape character areas (LCAs) or landscape character zones divide the landscape into distinct units with defining characteristics (RMS, 2018). Seven LCAs have been defined as shown in **Figure 16.1**. For LCA 1: Western Sydney Parklands, seven subcategory areas have been defined. All LCAs are described in detail in Section 5 of **Technical report L**.

The LCAs include:

- LCA 1: Western Sydney Parklands
  - 1A – Wallgrove productive areas
  - 1B – Motorsport park
  - 1C – Prospect Reservoir
  - 1D – Passive recreation
  - 1E – Active recreation
  - 1F – Sports facilities
  - 1G – Rural living
- LCA 2: Power and industrial estates
- LCA 3: Horsley Park Rural Residential
- LCA 4: Minchinbury local community
- LCA 5: Bungarribee local community
- LCA 6: WestLink M7 highway corridor
- LCA 7: Bush Creek Corridor.

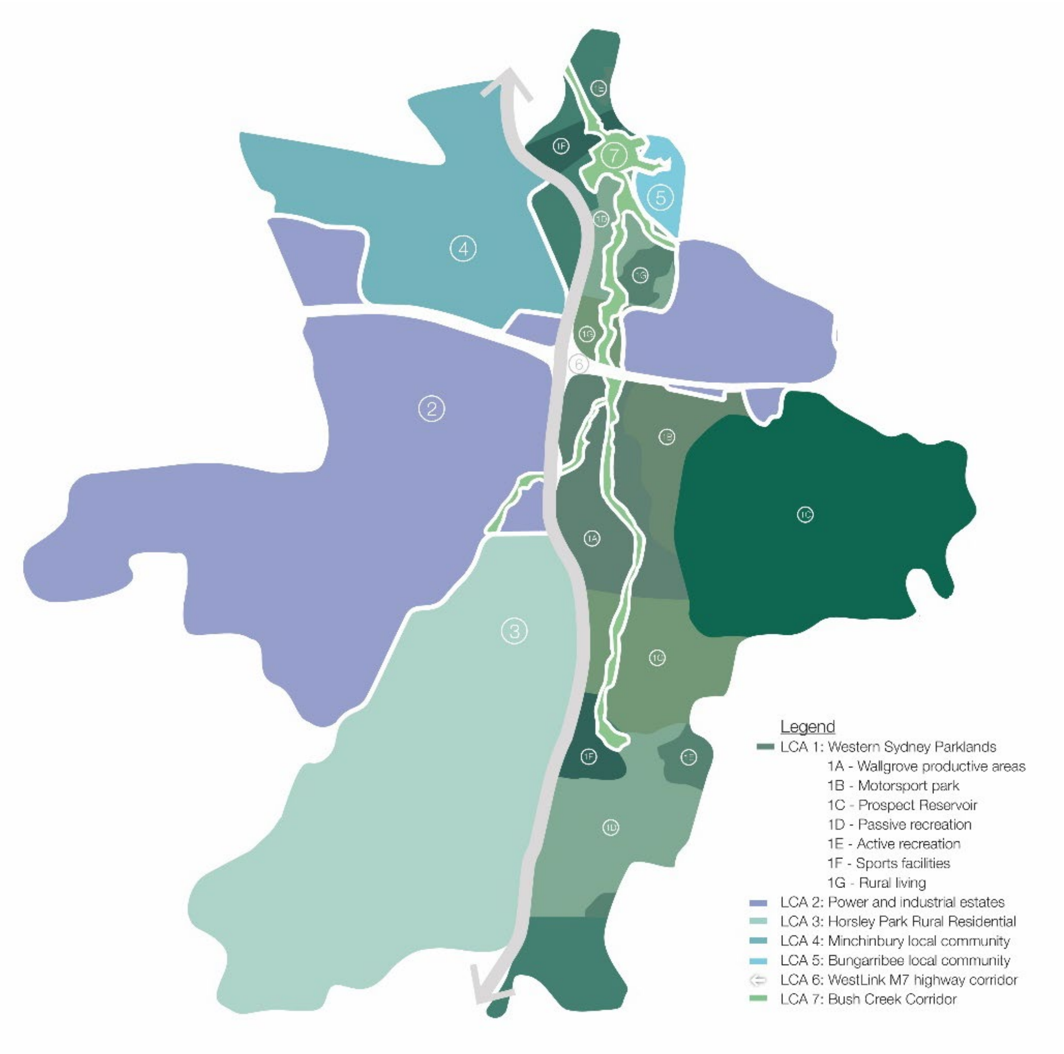


Figure 16.1: Landscape character areas

The landscape impact assessment considers impacts on the five LCAs that are directly impacted by the proposal. These are the LCAs that intersect with the proposal site or where the proposal has the potential to influence the setting of the LCA, and they include:

- LCA 1A: Wallgrove productive landscapes
- LCA 2: Power and Industrial estates
- LCA 3: Horsley Park Rural Residential
- LCA 6: WestLink M7 highway corridor
- LCA 7: Bushland creek corridor.

Table 16.3 describes these LCAs.

Table 16.3: Summary of the LCAs that are directly impacted by the proposal

LCA	Features
1A: WSP – Wallgrove productive landscapes	This LCA is associated with the areas located within the WSP boundary and includes the immediate site extent. The Wallgrove productive landscape contains a diverse range of interim land uses, such as landfill, waste recycling, brick making and quarrying. The area comprises warehouse style buildings and areas of disturbed land (from quarrying). Traffic movement is characterised by heavy machinery and large trucks entering the commercial and/or industrial worksites regularly.
2: Power and Industrial estates	This LCA is associated with areas to the west of the M7 corridor and the proposed site boundary. This LCA is defined by large warehouse buildings with wide road corridors and formal planting arrangements such as manicured hedging and wide streets. The LCA is experienced mostly by industrial and commercial workers and visitors located within the vicinity.
3: Horsley Park Rural Residential	This LCA is associated with the areas located south-west of the site boundary. This LCA is experienced by the nearest residential receivers from the proposal site, being 1km to the south at Horsley Park Rural Residential area. The LCA is defined by undulating plains, mostly cleared for agricultural land uses. It includes large plots of rural land with a coherent pattern of features, scattered patches of vegetation, residential buildings and agricultural structures. The surrounding productive and industrial land uses in neighbouring LCAs, indirectly influence the sensitivity of this LCA.
6: WestLink M7 highway corridor	This LCA is associated with the highway corridor located directly adjacent to the site boundary and extending north to south. The highway corridor has two north and south bound lanes separated by a wide grassed median strip.
7: Bushland creek corridor	This LCA includes the necessary habitat to the local flora and fauna. However, it meanders through the adjoining industrial and commercial areas and is split by the highway corridor. This indirectly influences the sensitivity of the ecological corridor which is experiencing construction as development continues to influence the edges of the riparian LCA.

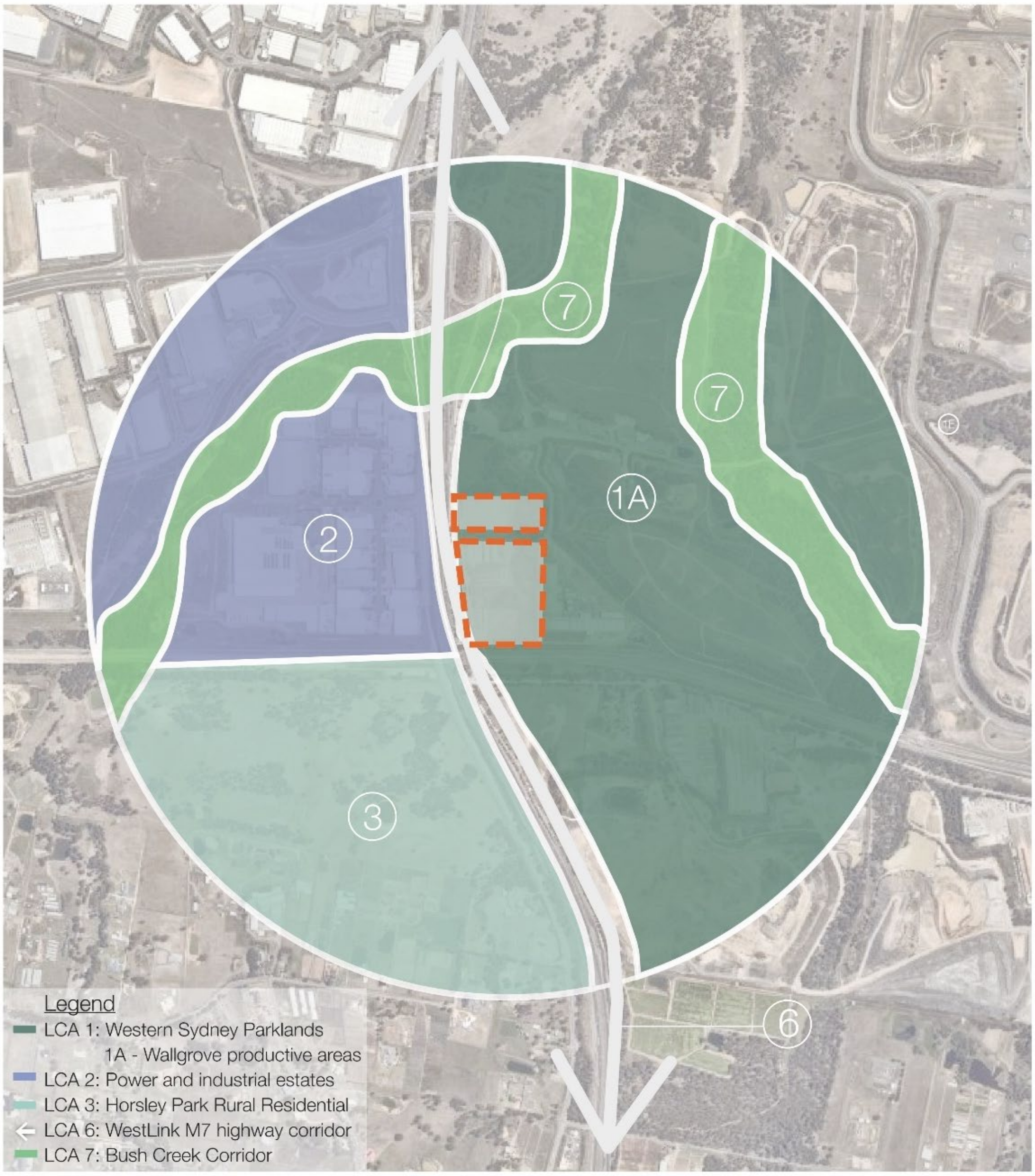


Figure 16.2: LCAs for impact assessment

16.3.1.2 Visual impact assessment

To assess the visual amenity of the proposal area, 15 viewpoints have been selected. Following site visits and desktop studies, the viewpoints were selected as they are within the visual envelope map (VEM) of the proposal. This means the proposal is visible from these viewpoints and they are representative of the type of views to the proposal. A description of each viewpoint and further details, including the sensitivity of each viewpoint, are available in section 5 of the LVIA.

Viewpoints were selected to illustrate:

- A range of receptor types including public and private domain views (residents, motorists and users of public open space)
- A range of view types including elevated, panoramic and filtered views
- A range of viewing distance from the proposal
- Main or protected views recognised within the planning literature.

The viewpoints are listed below and shown on **Figure 16.3**:

- Viewpoint 1 – Austral Bricks, Horsley Park
- Viewpoint 2 – Corner of Mini Link Road and Wallgrove Road
- Viewpoint 3 – Shared path – adjacent to Westlink M7
- Viewpoint 4 – Old Wallgrove Road, Eastern Creek
- Viewpoint 5 – Horsley Park Reserve
- Viewpoint 6 – Burley Road, Horsley Park
- Viewpoint 7 – Walworth Road, Horsley Park
- Viewpoint 8 – Ferrers Road, Lams Farm Fresh
- Viewpoint 9 – Sydney International Equestrian Centre
- Viewpoint 10 – Moonrise Lookout
- Viewpoint 11 – Prospect Reservoir
- Viewpoint 12 – Sydney Motorsport Park
- Viewpoint 13 – Sydney Zoo
- Viewpoint 14 – Bungarribee Homestead Park
- Viewpoint 15 – Pinegrove Memorial Park.

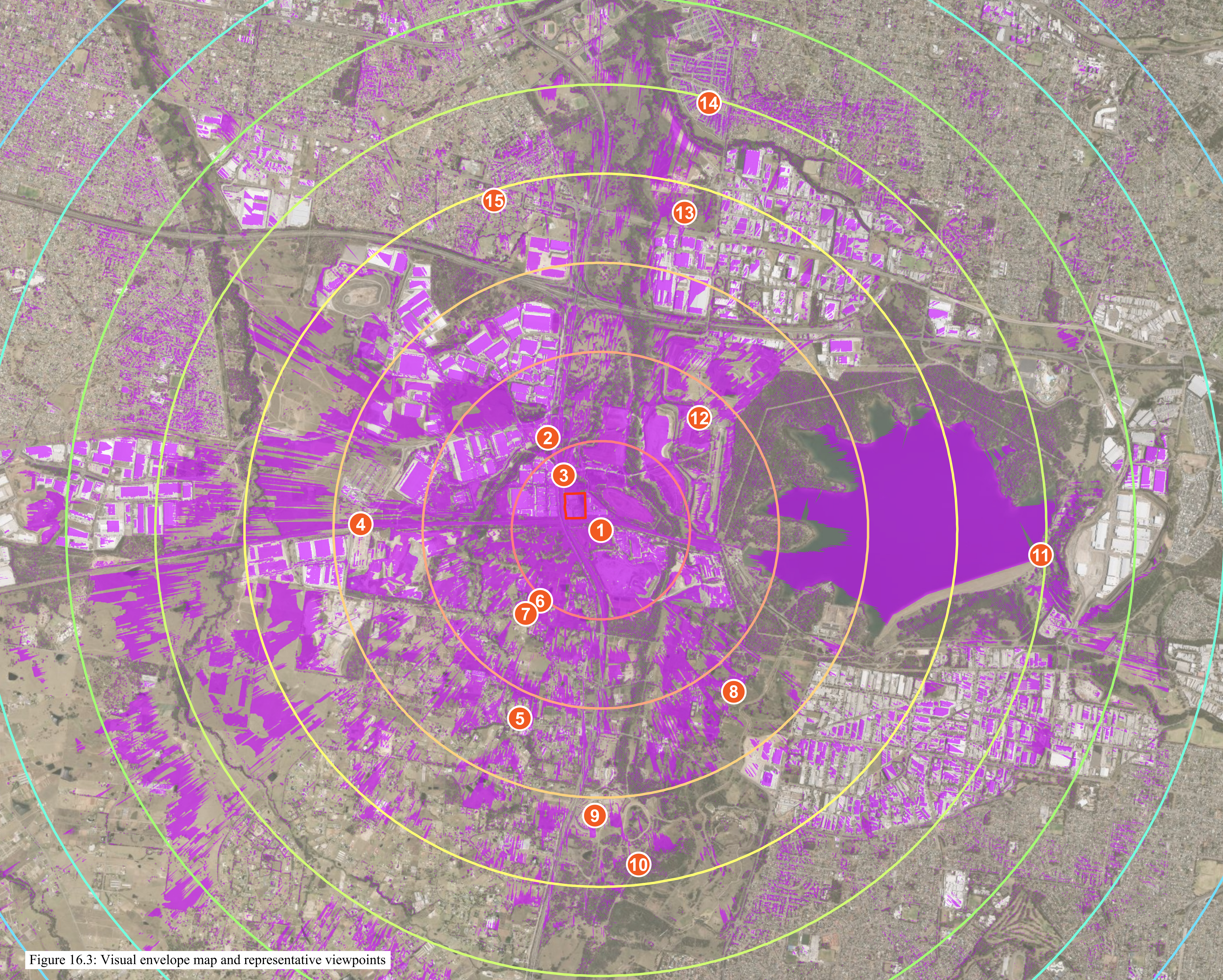


Figure 16.3: Visual envelope map and representative viewpoints

Figure 16.3 represents the VEM defining the visual catchment study area for the proposal and illustrates the theoretical area from which the building footprint, stack and plume (worst-case scenario) could be visible. Parameters for the plume representing 'worst-case scenario' included a visibility range from 100m wide to 100m high from the top of the stack.

Viewsheds from each individual viewpoint were generated to inform the analysis for the main infrastructure elements associated with the proposal. This included a viewshed with and without vegetation to represent the permeable nature of vegetation.

16.3.2 Construction impacts

16.3.2.1 Landscape impacts

The landscape impacts from the construction of the proposal are moderate-low, low or negligible as shown in **Table 16.4** below. The impacts to landscape character during construction will be concentrated in the area immediately surrounding the site and are consistent with existing industrial activities associated with the surrounding land uses of the area.

Table 16.4: Landscape impacts during construction

Landscape character area	Overall sensitivity	Construction	
		Magnitude of change	Impact
LCA 1A: WSP – Wallgrove productive landscapes	Low	Low	Low
LCA 2: Industrial and power estates	Low	Negligible	Negligible
LCA 3: Horsley Park Rural Residential	Moderate	Low	Moderate-Low
LCA 6: WestLink M7 highway corridor	Low	Low	Low
LCA 7: Bushland creek corridor	Moderate	Negligible	Negligible

16.3.2.2 Visual impacts

The visual impacts during construction are a result of the construction of the buildings and associated structures and construction machinery including cranes and vehicles. The construction impacts would be temporary in nature and only visible by people and businesses with direct sightlines of the construction site.

As shown in **Table 16.5**, the visual impacts during construction are anticipated to be low or negligible for Viewpoints 1, 2, 4, 5, 9, 13 and 15. The impact would be moderate or moderate-low for Viewpoints 8, 11, 12, and 14. However, Viewpoints 3, 6, 7, and 10 are considered to be impacted to a high-moderate extent.

Viewpoint 3 is only 200m from the perimeter of the proposal site, and the representative view from the shared path looks directly at the proposal site. Existing vegetation which currently screens the proposal site from view is likely to be removed, and the construction activities would become the dominant feature in this view. The view is representative of pedestrian and cyclists with a transient interest in the surrounding environment. In addition, any construction impacts on visual amenity will be temporary.

Viewpoints 6 and 7 have moderate sensitivity as they are from rural residential settings and would experience a high magnitude of change. During construction, the proposal would gradually emerge as a dominant structure within the viewpoint.

Viewpoint 10 has a high sensitivity due to its elevated position, and a moderate magnitude of change would be experienced at this viewpoint. Construction impacts on this viewpoint would be gradual as the taller structures of the proposal are built, such as the stack.

Table 16.5: Visual impacts during construction

Viewpoint	Sensitivity	Magnitude of change	Construction impact
1 Austral Bricks	Low	Low	Low
2 Corner of Mini Link Road and Wallgrove Road	Low	Low	Low
3 Shared cycle path – adjacent to Westlink M7	Moderate	High	High-Moderate
4 Old Wallgrove Road	Low	Negligible	Negligible
5 Horsley Park Reserve	Moderate	Negligible	Negligible
6 Burley Road, Horsley Park	Moderate	High	High-Moderate
7 Walworth Road, Horsley Park	Moderate	High	High-Moderate
8 Ferrers Road, Lams Farm Fresh	Moderate	Moderate	Moderate
9 Sydney International Equestrian Centre	Moderate	Negligible	Negligible
10 Moonrise lookout	High	Moderate	High-Moderate
11 Prospect Reservoir	Moderate	Low	Moderate-Low
12 Sydney Motorsport Park	Moderate	Low	Moderate-Low
13 Sydney Zoo	Moderate	Negligible	Negligible
14 Bungarribee Homestead Park	Moderate	Low	Moderate-Low
15 Pinegrove Memorial Park	Moderate	Negligible	Negligible

16.3.3 Operation impacts

16.3.3.1 Landscape impacts

Once operational, the impacts of the proposal on all LCAs are assessed to be low to negligible, except for LCA 3: Horsley Park Rural Residential which is assessed to have a moderate-low impact.

LCA 3: Horsley Park Rural Residential has a moderate sensitivity rating due to it being a residential area. The proposal would result in additional built form near this LCA, including the introduction of the stack and the consequential plume. This would result in the incremental expansion of industrial characteristics that define the northern edge of this LCA.

Table 16.6: Landscape impacts during operation of the proposal

Landscape character area	Overall sensitivity	Operation	
		Magnitude of change	Impact
LCA 1A: WSP – Wallgrove productive landscapes	Low	Low	Low
LCA 2: Industrial and power estates	Low	Negligible	Negligible
LCA 3: Horsley Park Rural Residential	Moderate	Low	Moderate-Low
LCA 6: WestLink M7 highway corridor	Low	Low	Low
LCA 7: Bushland Creek corridor	Moderate	Negligible	Negligible

16.3.3.2 Visual impacts

Visual impacts during operation (daytime)

The proposal includes large visual elements, such as the stack and plume which would result in a noticeable change for several viewpoints. The impact on these viewpoints is greater where the surrounding landscape has higher sensitivity, being within the Western Sydney Parklands and viewpoints that are in closer proximity to the proposal. Visual impacts are typically reduced with increased distance from the site.

Table 16.7: Visual impacts during operation of the proposal

Viewpoint	Sensitivity	Magnitude of change	Operation impact
1 Austral Bricks	Low	Low	Low
2 Corner of Mini Link Road and Wallgrove Road	Low	Low	Low
3 Shared cycle path – adjacent to Westlink M7	Moderate	High	High-Moderate
4 Old Wallgrove Road	Low	Negligible	Negligible
5 Horsley Park Reserve	Moderate	Negligible	Negligible
6 Burley Road, Horsley Park	Moderate	High	High-Moderate
7 Walworth Road, Horsley Park	Moderate	High	High-Moderate
8 Ferrers Road, Lams Farm Fresh	Moderate	Moderate	Moderate
9 Sydney International Equestrian Centre	Moderate	Negligible	Negligible
10 Moonrise lookout	High	Moderate	High-Moderate
11 Prospect Reservoir	Moderate	Low	Moderate-Low
12 Sydney Motorsport Park	Moderate	Low	Moderate-Low
13 Sydney Zoo	Moderate	Low	Moderate-Low
14 Bungarribee Homestead Park	Moderate	Low	Moderate-Low
15 Pinegrove Memorial Park	Moderate	Negligible	Negligible

The greatest visual impacts would be experienced at Viewpoint 3, 6, 7 and 10. The impacts on these viewpoints are discussed below.

Viewpoint 3: Shared path, adjacent to Westlink M7 has a moderate sensitivity as the view represents users from the shared path and there is a mix of vegetation and major road infrastructure within this view. The magnitude of change is high for this viewpoint due to the proximity of the viewpoint to the proposal site. The proposal would result in the removal of vegetation, replaced with large scale buildings.

Figure 16.4 Viewpoint 3

Figure 16.5: Viewpoint 3 with proposal (note, vegetation is transparent to show building extent)

Viewpoints 6 and 7 both have a moderate sensitivity as representative views from residential properties, with transmission lines and powerlines within the view. The proposal would become a dominant feature for both viewpoints, and the plume would introduce a new element to this otherwise predominantly rural setting, resulting in a high magnitude of change.

Figure 16.6: Viewpoint 7

Figure 16.7: Viewpoint 7 with proposal

Viewpoint 10: Moonrise lookout is elevated and highly sensitive to change. While the proposal is nearly 4km from this viewpoint, the elevated nature of the viewpoints means that the proposal would be visible within the viewpoint vista. The plume would be visible from the viewpoint location and would be clear to a receptor at this viewpoint.

Figure 16.8: Viewpoint 10

Figure 16.9: Viewpoint 10 with proposal

Lighting impacts (night-time)

The lighting design is proposed to achieve a dim glow from localised areas of the proposal such as the flue gas treatment hall. Lighting will not be directed at building facades, rather it will portray a glow within the building. The stack would also be lit in line with Federal Aviation Administration guidelines.

Table 16.8: Night-time lighting impacts from the proposal

Viewpoint	Sensitivity	Magnitude of change	Operation impact (Night-time)
1 Austral Bricks	Moderate	Low	Moderate-Low
2 Corner of Mini Link Road and Wallgrove Road	Low	Negligible	Negligible
3 Shared cycle path – adjacent to Westlink M7	Low	Moderate	Moderate-Low
4 Old Wallgrove Road	Low	Negligible	Negligible
5 Horsley Park Reserve	Moderate	Negligible	Negligible
6 Burley Road, Horsley Park	Moderate	Moderate	Moderate
7 Walworth Road, Horsley Park	Moderate	Moderate	Moderate
8 Ferrers Road, Lams Farm Fresh	Moderate	Moderate	Moderate
9 Sydney International Equestrian Centre	Moderate	Negligible	Negligible
10 Moonrise lookout	High	Low	Moderate
11 Prospect Reservoir	High	Negligible	Negligible
12 Sydney Motorsport Park	Low	Low	Low
13 Sydney Zoo	Low	Low	Low
14 Bungarribee Homestead Park	Moderate	Low	Moderate-Low
15 Pinegrove Memorial Park	Moderate	Negligible	Negligible

For each viewpoint, the existing brightness of the area was assessed against the expected light emitted from the proposal. Viewpoints with an existing high-brightness area or further away from the proposal would be less impacted by lighting from the proposal. Those viewpoints which are intrinsically dark (having a high sensitivity) would be more impacted by lighting from the proposal. Overall lighting impacts are assessed to be moderate to negligible for all viewpoints.

Those viewpoints with the highest impact rating of moderate, are Viewpoints 6, 7, 8 and 10. All these viewpoints have a moderate or high sensitivity – they are areas with existing low levels of lighting due to their semi-rural nature or landscaped setting. The lighting emittance from the proposal will be visible from these viewpoints.

The lighting will be designed to achieve a dim glow in localised areas and as such would not cause lighting impacts which would distract or compromise the safe operation of the surrounding road network, including the M7.

16.3.3.3 Overshadowing

An assessment of the potential overshadowing impacts of the proposal on nearby properties was carried out. This assessed the shadow cast by the building footprint, form, scale and roof heights, based on the winter solstice (21 June), which marks the shortest period of daylight during the year. This represents the worst-case scenario in terms of potential overshadowing impacts. **Figure 16.10** shows the modelled overshadowing from the proposal.

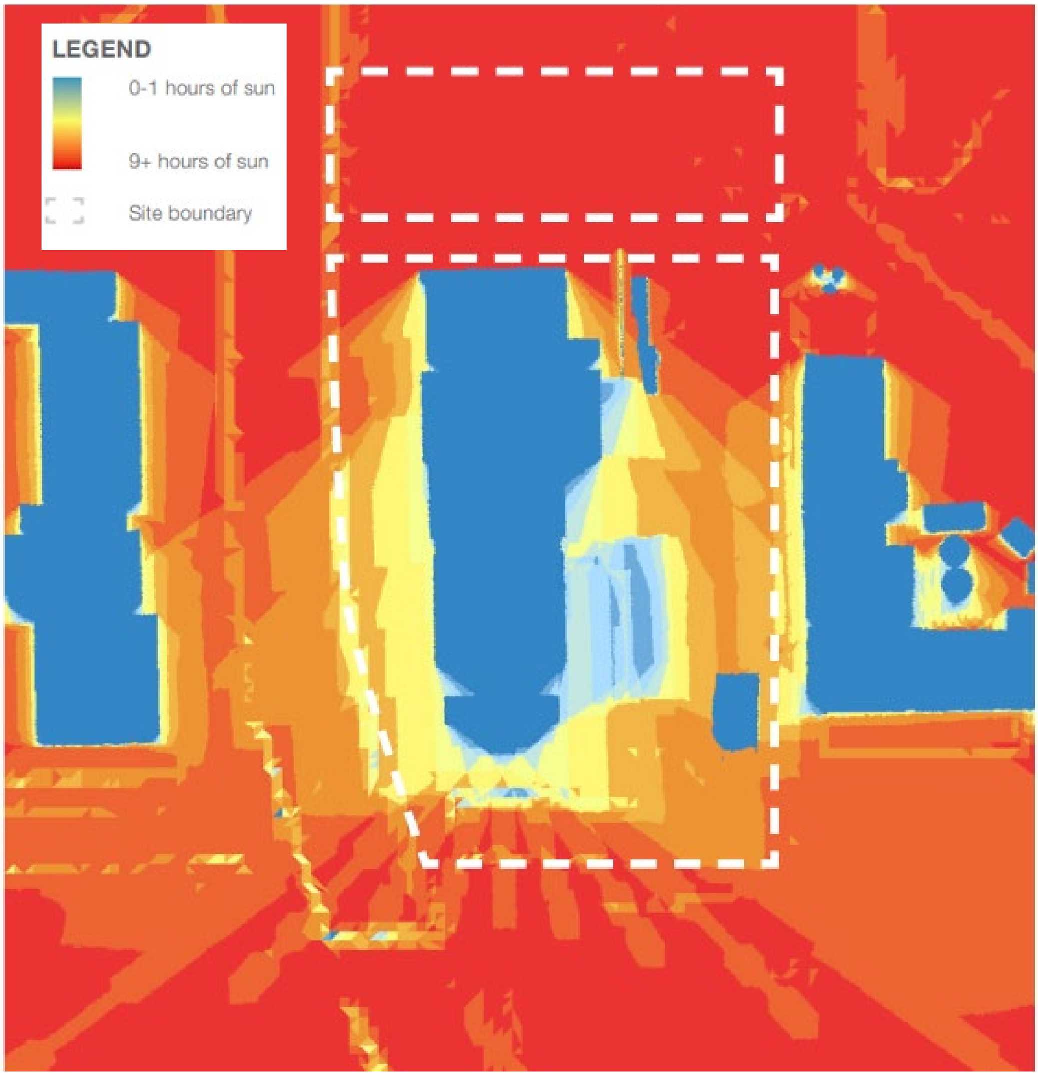


Figure 16.10: Modelled overshadowing from the proposal

Overshadowing to the west of the site would be experienced by users of the footpath and motorists on the M7. However, this overshadowing is not considered to adversely impact the experience for these users as the overshadowing is of a localised nature and receptors would be transient.

The existing vegetation on the M7 embankment to the west of the proposal site would likely experience a reduction in daily sun exposure from 9+ hours to 5-7 hours. The reduction of direct day light hours on existing vegetation is not anticipated to adversely impact the survival and growth of existing vegetation.

Immediate landscaping surrounding the proposal site to the south and southeast would be impacted by a reduced sun exposure from full day sun to 7–8 hours daily. As above, this reduction in sunlight exposure is not anticipated to adversely impact the vegetation.

Overshadowing to the east of the proposal site would impact the Global Renewables property perimeter. Sun exposure at this location would reduce from 7–8 hours daily to 5–6 hours daily.

16.4 Mitigation

The design of the proposal includes features which contribute to mitigating landscape character and visual impacts, as described in **Table 16-9**.

Table 16.9: Mitigation measures

ID	Impact	Proposed mitigation
Design embedded mitigation measures		
LV1	Visual impacts of stack	Integrating the design of the stack and blade wall to mitigate visual impact where possible. Careful consideration of the choice of colour and material properties and/or introducing designed elements into the physical design of the stack.
LV2		Material selection will involve careful selection of colour and low-reflective material to make sure the stack appears recessive above the skyline.
LV3	Bulk of building	Incorporation of a green wall (vegetated system grown vertically) to the northern and southern extent of the building and a green roof to the Visitor and Education Centre. The Urban Green Cover in NSW Technical Guidelines (OEH, 2015) will be referred to during detailed design of the green walls and roof.
LV4		The architecture has been designed to reduce the building bulk and locate the greatest massing height in the centre of the built form, to mitigate abrupt change in scale. Positioning the built form towards the south western boundary aligns with exiting local developments and is orientated on a north-south axis to align with the M7.
LV5	Lighting impacts	Limit lighting spill to the stack by careful placement of lighting columns. Lighting would be designed to achieve a dim glow in localised areas such as the flue gas treatment hall. Any lighting treatments will not be directed at the building's facades.
LV6	Loss of vegetation	Increase density of planting across the site, which will help to screen ancillary infrastructure and enhance the landscape character within the proposal site.
Construction mitigation measures		
LV7	Visual impacts	Visual barriers around the site will be created and maintained throughout the construction period, to minimise visual impacts during construction.

Chapter 17

Social

17 Social

17.1 Introduction

This chapter summarises the potential social impacts resulting from the construction and operation of the proposal. A Social Impact Assessment (SIA) has been prepared and is included as **Technical report M**. The SIA has been produced referring to the Department's Social Impact Assessment Guideline[1].

The Social Impact Assessment Guideline defines social impact as a consequence experienced by people due to changes associated with the proposal.

Those impacts may include changes to people's way of life, community character, access to infrastructure and facilities, culture, health and well-being, surroundings, personal and property rights, decision-making systems and fears and aspirations, among others.

Social impacts can be experienced differently by different people and can also include perceptions of impact.

The assessment of social impacts draws on the assessment of other impacts in the EIS, such as noise, visual, air quality and transport. While these other assessments typically evaluate potential impact against recognised standards and criteria, SIA tries to understand how these impacts are experienced and valued by people, including their perceptions of impact.

Drawing on the Social Impact Assessment Guideline, the methodology for undertaking the SIA included the following steps:

- Definition of the area of social influence for the proposal. This was informed by the scale and characteristics of the proposal, its location and relationship to nearby land uses, built and natural features and statistical boundaries.
- Review of existing information to establish a social baseline:
  - Relevant policy, legislation and zoning
  - Population and demographic data
  - Local businesses, community facilities and residential communities
  - Community consultation outputs.
- Assessing the potential social impacts and their significance, having regard to the scale, extent, duration, severity, likelihood and level of risk or benefit associated with each impact. The significance presented in **Section 17.3** is before mitigation measures are applied.

---

[1] Department of Planning, Industry and Environment (DPIE), *Social impact assessment guideline for State significant mining, petroleum production and extractive industry development* (September 2017)

- Deciding on mitigation and management actions to address potential impacts, and therefore assessing the residual impact following application of mitigation measures presented in **Section 17.5**.

Social impacts have been defined to include both the potential positive and negative impacts associated with the proposal. The methods adopted are described in detail in section 2 of the SIA.

17.2 Existing environment

A social baseline has been developed to get an understanding of the existing social conditions at the proposal site and in the surrounding area and to understand the potential social impacts of the proposal. A local study area is made up of areas mostly within a 3km radius of the site, as these areas have the potential to experience the most significant and direct change to conditions as a result of the proposal. To account for potential flow-on impacts in the surrounding area, the following has been considered:

- The wider Blacktown and Fairfield Local Government Areas (LGA), noting the proposal is located on the border between the two
- NSW State
- National context.

This section summarises the social baseline for the local study area and wider impact areas. This is described in detail in section 3 of the SIA.

17.2.1 Policy context

The proposal is within the Western Sydney Parklands (WSP), with the State Environmental Planning Policy (SEPP) (Western Sydney Parklands) 2009 being the key planning policy relevant to the proposal supported by the WSP Plan of Management 2030. Collectively, these establish the framework for the future land use on the site and those areas surrounding the site, also within the WSP.
The proposal is consistent with the WSP SEPP and Plan of Management, including the recycling and renewable energy objectives for Precinct 6 of the Plan of Management, within which the site is located.

The Greater Sydney Regional Plan and the Central City District Plan create the broader context, including a desire to increase infrastructure to support economic and population growth. In addition, the Blacktown City Council Local Strategic Planning Statement and Community Strategic Plan, alongside the neighbouring Fairfield City Plan, provide an overview of the wider community aspirations and needs as an indicator of the community values within the local study area (summarised in section 3.1 of the SIA).

17.2.2 Community profile

This section presents a demographic analysis of the local study area comprised of ABS Census Statistical Area 2 (SA2) level areas of Prospect Reservoir and Horsley Park – Kemps Creek SA2s.[2] The community profile is described in detail in section 3.2 of the SIA.

17.2.2.1 Population and households

The population in the local study area was 4,465 in 2016. However, most of this is within the southern parts of the Horsley Park – Kemps Creek SA2, beyond the 3km radius of the local study area. The population within the Prospect Reservoir SA2 area, where the proposal site is located, is minimal, and the nearest residential community is about 1km away, at Horsley Park. While growth is planned in the wider region, residential development is not permitted in the WSP or the Western Sydney Employment Area, to the west of the proposal site. Therefore, population growth in the local study area is expected to be low.

17.2.2.2 Vulnerable communities

Vulnerable communities are a subgroup of the overall population who are at a higher risk of experiencing problems. The Socio-Economic Indexes for Areas (SEIFA) score for the local study area was 7 in 2016, indicating a relatively advantaged area, particularly when compared to the surrounding SA2s. However, the average household size in the local study area was 3.4 persons in 2016, larger than the average household size in the wider LGAs, which indicates many families living in the local study area. Families may be more vulnerable to certain social impacts such as amenity and transport.

About 7% of the local study area reported having a need for help with core activities in 2016, similar to that reported for the wider region and State. Moreover, the age profile of the local study area indicates a low proportion of young and elderly people compared to LGA and State averages.

17.2.2.3 Resident employment and income

The median weekly household income in the local study area was $1,976 in 2016, which was higher than the median for Blacktown and Fairfield LGAs and the wider State. In the local study area, the median weekly rent is about 20% of the median weekly household income, below the 30% level commonly associated with housing stress.

[2] These are the two SA2 areas that intersect with the local study area, 3km from the proposal site. Note that the southern parts of Horsley Park – Kemps Creek, which are not within a 3km radius of the site, are heavily residential, and the social baseline is considered in that context.

Of the working-age resident population in the local study area, 56% were employed in 2016, mostly within construction, retail trade, and transport, postal and warehousing industries. The unemployment rate in the local study area was 2.3%, significantly lower than for Blacktown and Fairfield LGAs.

17.2.2.4 Business and employment

The local study area is a significant employment area for the region, and wider State. In 2016 it created 21,043 jobs, and the Prospect Reservoir SA2 alone accounted for about 17% of all jobs in Blacktown LGA. In June 2019, there were 1,525 businesses in the local study area[3]. Most of these were in the construction (21%), rental, hiring and real estate services (18%), and wholesale trade (11%) industries. There are several business parks within the local study area, associated with the wider Western Sydney Employment Area, an identified area for industrial development for transport, logistics, warehousing and office space.

17.2.2.5 Travel behaviour

The local study area has a high reliance on private vehicle travel. Almost 75% of residents travel by car to work, while between 85% and 90% of people commute into the area by car. A large proportion of residents also work in the area, with a self-containment rate of 25%. The high ownership and use of motor vehicles reflect the limited public transport in the area, with only Blacktown, Seven Hills and Mount Druitt supported by train services.

17.2.3 Community and stakeholder values

The approach to community and stakeholder engagement for the proposal is detailed in the Community and Stakeholder Engagement Report included in **Appendix F**. Key issues raised by engagement activities which are of relevance to the SIA include:

- The safety of locating the facility in proximity to residential areas
- The potential impact of emissions (gasses and particulates) on people's health
- Anticipated traffic issues
- Potential negative impacts on recycling habits
- Perceived negative impacts on property values, potential increase in council rates
- Environmental impacts, including on plants, water and air quality

[3] Australian Bureau of Statistics, *Counts of Australian Businesses, including Entries and Exits, June 2015 to June 2019* (2020).

- The (in)efficiency of the facility and its ability to adapt to technological change
- The facility not achieving compliance with international and local regulations or reflect best practice
- The operation would lack the appropriate monitoring, reporting and enforcement of safety and environmental standards.

The community also recognises the positive impacts that an EfW facility would have, regarding it as a beneficial use of waste, valuable source of cheaper energy, providing local jobs and being better for the environment than landfill.

A review of the Community Strategic Plan for Blacktown[4] and the Fairfield City Plan[5] highlights key values for the wider community. These include:

- Sustainable growth of the local economy and employment
- Diverse, safe and accessible communities
- Clean, sustainable and healthy environment
- Community cohesion, health and wellbeing and lifelong learning
- Active engagement in planning and decision-making.

A detailed summary of community values is available in section 3.3 of the SIA.

17.2.4 Land use and social infrastructure

The proposal site is bounded by the Westlink M7 Motorway (the M7) to the west, with the Eastern Creek industrial area located farther west. The local study area is characterised by industrial, commercial and transport land uses. The site sits within the WSP, an urban park system, and is near Prospect Reservoir east of the site, a designated nature reserve and conservation area, which plays a water storage and supply infrastructure role.

The existing site contains former industrial uses, with buildings associated with a disused poultry facility, which will be cleared from the site before starting to build. It falls within the Wallgrove Precinct in the WSP Plan of Management 2030, which is recognised

‘to be an evolving precinct that…has potential for the development of renewable energy and recycling opportunities, agriculture, unstructured recreation and sport uses, and a potential WSPT Business Hub development.’

A large proportion of the wider local study area also falls within the WSP, including land to the east within Eastern Creek Motor Sports Precinct 5.

---

[4] Blacktown City Council, *Our Blacktown 2036, Our vision, Our plan* (2017). Community Strategic Plan, viewed 27 March 2020.
[5] Fairfield City Council, *Fairfield City Plan* (2016). Viewed May 2020.

Prospect Reservoir and Nature Reserve Precinct 8 is located farther east, which supports protection of the Prospect Reservoir. It is a designated nature reserve and conservation area and main water storage and supply infrastructure. Within the western part of the local study area, a significant portion is covered by the Western Sydney Employment Area, formed to supply employment land close to major road transport and create jobs for Western Sydney.

The nearest residential area is around 1km to the south of the site in Horsley Park, with the Minchinbury residential area located around 3km to the north-west. Horsley Park Public School is over 2km south of the site, and a childcare centre is within the Eastern Creek industrial area about 1km to the west of the site.

A detailed summary of the land use context is available in section 3.4 of the SIA.

17.3 Assessment

This section identifies and evaluates the potential social impacts of the proposal, as detailed in section 5 of the SIA. It covers impacts for the local study area, drawing on assessment of the impacts at the regional, State and national levels as appropriate and relevant. Cumulative impacts associated with the proposal are addressed in **Chapter 23 Cumulative impacts**.

Direct property and access impacts are not considered within the assessment as no property acquisitions are needed as part of the proposal. Works to upgrade access to the site are outside of the scope of the proposal but are outlined in **Chapter 22 Related development**.

The social impacts are assessed using an impact evaluation matrix shown in **Table 17.1** below. This is adapted from the Department's Social Impact Assessment Guideline and assesses the likelihood of the impact against the potential consequence to determine the overall impact.

Table 17.1: Impact evaluation matrix adopted for the proposal

		Consequence				
		Minimal	**Minor**	**Moderate**	**Major**	**Catastrophic/ transformational**
Likelihood	Almost certain	Medium	Medium	High	Very high	Very High
	Likely	Low	Medium	Medium	High	Very High
	Possible	Low	Low	Medium	High	High
	Unlikely	Very low	Low	Low	Medium	High
	Rare	Very low	Very low	Low	Medium	Medium

17.3.1 Construction impacts

This section summarises the potential social impacts associated with construction of the proposal.

17.3.1.1 Way of life

Liveability

Impacts to liveability are expected to be unlikely during the construction phase, and minimal in consequence where experienced. Amenity impacts from construction of the proposal (such as noise or air quality impacts) may affect some residential receivers closest to the proposal site. This may result in these residents changing their behaviour to avoid impacts such as keeping windows and doors shut. These impacts are considered unlikely as the nearest residential community is at least one kilometre away from the proposed. Any impacts would be experienced as a slight nuisance and inconvenience, and would be temporary, therefore would have only a low negative impact to their way of life.

Findings from the engagement activities indicated the community's concerns regarding the facility's implications on liveability and way of life generally relate to the operation of the facility, rather than construction. The operation impacts are assessed in **Section 17.3.1.1**.

Employment

It is estimated that the proposal will create 900 direct construction jobs over the 3-year construction period and in addition between 700–1200 indirect construction jobs as a result of the demand for materials and products to support construction. The construction of the proposal will require trades and construction personnel, subcontractors and engineers, functional and administrative staff. These impacts are assessed to be likely, moderate in consequence, resulting in an overall high positive social impact regarding employment and business opportunities.

Traffic and congestion

As summarised in **Chapter 15 Traffic and transport,** during construction there will be an increase in the number of vehicles using local roads from construction worker and construction vehicle movements. If not managed appropriately, this could lead to an increase in congestion on local roads, which could impact on people's daily routines and/or business operations and cause associated stress and anxiety. However, a Construction Traffic Management Plan (Appendix A of **Technical report K Traffic and Transport**) has been prepared and will be updated by the appointed contractor to make sure impacts on the road network are minimised and managed.

Workers and residents closest to the site may experience a reduction in amenity, such as increased traffic noise and emissions – this is unlikely to be significant enough to cause any stress and anxiety. The impacts will be likely, and minimal in consequence, resulting in an overall moderate negative social impact.

Mode of travel

Given the localised nature of the proposal, and the small scale of uplift in vehicle traffic, and the proposed management of impacts, the proposal is not expected to have any impact on the travel behaviours regarding mode of travel. This impact is assessed to be rare, and minimal in consequence, resulting in an overall low negative social impact.

17.3.1.2 Community

Demographic composition and vulnerable groups

The construction of the proposal would not significantly impact on the socio-demographic profile of the existing community (gender, age, ethnicity).
The baseline data indicates the study area has a large existing working age population and a significant proportion of the population are employed in the construction industry. The construction of the proposal is unlikely to require a large influx of a construction workforce into the study area and would not result in a subsequent shift in the demographic composition of the community.

Business community

There are no direct significant negative impacts anticipated associated with the proposal upon local businesses, rather there are a number of potential positive impacts associated with construction activities.

Construction of the proposal may result in new business and employment opportunities within the supply chain. The range of construction, wholesale and logistics businesses in the local study area do not typically rely on passing trade, so no impacts to footfall and/or turnover are expected as a result of the proposal.

Access to the local businesses is generally via the M7, so the proposal is also not expected to impact on access during construction. Businesses may experience possible amenity impacts from construction activities as described in **Section 17.3.1.2** above. This impact is assessed to be possible, and minimal in consequence, resulting in an overall low negative social impact.

17.3.1.3 Access to and use of infrastructure, services and facilities

Social infrastructure and facilities

The proposal will not directly impact on any of the identified social infrastructure within the local study area. These facilities may experience amenity impacts from construction, as summarised in the amenity section. This impact is assessed to be rare, and minimal in consequence, resulting in an overall low negative social impact.

Utilities infrastructure

The proposal will include relocation and protection of utilities which run through the site, which may result in a temporary disruption to utilities, which could have social impacts on household and business routines and service provision. Any disruptions to services due to utility adjustments would be discussed with key stakeholders and communities would be notified of outages in advance of works. This impact is assessed to be possible, and minor in consequence, resulting in an overall moderate negative social impact.

17.3.1.4 Health and wellbeing

Air quality impacts

Certain construction activities have the potential to generate quantities of dust and exhaust emissions which could cause nuisance to nearby businesses. Construction activities would be temporary, and **Technical report A Air Quality and Odour Assessment Report** predicts no significant or prolonged effect as a result of construction activities, and as such, does not quantitatively model potential impacts. As a result, the social impact is assessed to be unlikely, and minimal in consequence, resulting in an overall low negative social impact.

Findings from consultation activities indicated the community’s concerns regarding the facility’s implications on health and wellbeing are generally related to the operation of the facility, rather than construction. These impacts are discussed in **Section 17.3.2**.

17.3.1.5 Surroundings

Visual impacts

Landscape character and visual impacts are assessed in **Chapter 16 Landscape and visual** and **Technical report L Landscape and Visual Impact Assessment**. The construction of the proposal would result in some social impacts associated with temporary visual impacts within the local study area.

The construction would require the removal of vegetation, set-up of site compounds and laydown areas and building of the facility. However, considering the industrial character of the site and surrounding area, these impacts would be localised.

While mostly seen from the neighbouring industrial areas, as construction progresses, the built form of the facility and associated construction equipment needed will gradually be more prominent and be seen from surrounding Horsley Park rural residential area and Moonrise Lookout, a lookout from a recreation trail from within the WSP. This could prompt a sense of loss in the community of valued views and character. However, these are in limited areas, and the visual impact of construction is considered temporary, with plant and equipment being removed after completion. This impact is therefore assessed to be possible, and minor in consequence, resulting in an overall moderate negative social impact.

Noise impacts

The Noise and Vibration Impact Assessment (**Technical report I**) as summarised in **Chapter 13 Noise and vibration**, indicates that noise associated with construction vehicles travelling to and from the site would have an insignificant short-term effect on the ambient noise environment. It also predicts construction noise levels at nearby industrial, commercial and residential receivers to the south of the proposal site that would exceed the relevant noise management levels. While this could potentially cause annoyance – for example, causing residents to keep windows and doors closed to reduce internal noise while particularly noisy works are taking place, – it would not negatively impact on people’s health and wellbeing. The assumptions are based on conservative predictions, and the magnitude of construction noise impacts would depend on a range of matters such as the intensity and location of activities, the type of equipment used, and background noise during construction. The predicted noise levels would only be experienced while the works are occurring and are short-term and temporary in nature. A Construction Noise and Vibration Management Plan (CNVMP) will be prepared to minimise construction noise impacts.

This impact is assessed to be possible, and minor in consequence, resulting in an overall moderate negative social impact.

Land use and zoning

The construction of the proposal would have no negative impacts in terms of land use and zoning. The proposal aligns with the industrial nature of the site, and surrounding areas. There may be increased business opportunities as a result of construction, particularly within the supply chain, noting the large proportion of construction businesses in the local study area. This impact is assessed to be likely, and minor in consequence, resulting in an overall high positive social impact.

The proposal is not expected to impact on future development activities in the local study area. However, there may be some impacts associated with overlap of construction activities, including availability of construction workers. This impact is assessed to be possible, and minor in consequence, resulting in an overall moderate negative social impact.

17.3.1.6 Personal and property rights

No acquisition of property is required for the proposal and impacts to property rights are not foreseen. However, some people may perceive that living near the construction of an EfW facility would create a less desirable living environment. Therefore, there is a possible likelihood and minor consequence of perceived social impact associated with personal and property rights for some members of the local study area, resulting in a moderate impact.

17.3.1.7 Decision-making systems

The proposal is not anticipated to impact on existing decision-making systems in place. Through the engagement approach, the applicant seeks to achieve a two-way discussion, encourage input into the EIS process and develop a long-term relationship with the community.

Feedback obtained from the engagement to date indicates a level of doubt in the planning and decision-making process for the proposal. Therefore, there is a possible perceived negative impact on decision making.

17.3.1.8 Fears and aspirations

While building of the facility could lead to a sense of loss of community values, particularly those associated with key views and the broader rural character of the local study area, the proposal does not represent a significant change from the current character of the proposal site. So, the immediate loss is expected to be minimal. In addition, there may be some minor impacts associated with increased noise, traffic and dust, and the anticipation of negative impacts (known, unknown or perceived), which could cause stress in local residents.

However, these are expected to be temporary and localised in nature and are anticipated to be managed through the WSERRC communications and engagement approach documented in the Community and Stakeholder Engagement Report in **Appendix F**.

This impact is assessed to be possible, and minor in consequence, resulting in an overall moderate negative social impact.

17.3.1.9 Summary of construction impacts

Table 17.2 below summarises social impacts from the construction of the proposal. Any negative construction impacts will be medium to low and temporary. The proposal would have a beneficial impact of creating employment and business opportunities along the supply chain during construction.

Table 17.2: Summary of construction impacts

Impact	Extent of impact	Impact		
		Likelihood	Consequence	Impact Rating
Negative impacts				
Potential impact on livability due to construction dust, noise and vibration	Local study area and regional	Unlikely	Minimal	Low
Potential impact on way of life due to incrase in traffic and confestion	Residents and communities within the local study area, commuters from the regional area	Likely	Minimal	Moderate
Potential impact on way of life related to changes to mode of travel	Residential and communities within the local study area, commuters from the regional area	Rate	Minimal	Low
Potential impact on demographic composition and vulnerable groups	Local study area and regional	Unlikely	Minimal	Low
Potential social impact to local businesses and business environment associated with amenity and traffic impacts	Local study area	Possible	Minimal	Low
Potential social impact due to changes to access and use of social infrastructure and community facilities	Residents and communities within the local study area	Rare	Minimal	Low
Potential social impact due to changes to utilties and infrastructure and provision	Local study area	Possible	Minor	Moderate
Potential social impact due to increased air emissions	Local study area	Unlikely	Minimal	Low
Potential social impact due to landscape and visual changes	Local study area	Possible	Minor	Moderate
Potential social impact due to increased noise emissions	Local study area	Possible	Minor	Moderate

Impact	Extent of impact	Impact		
		Likelihood	Consequence	Impact Rating
Potential impact to current land uses and operations	Local study area	Unlikely	Minimal	Low
Potential social impact related to personal and property rights	Local study area	Unlikely	Minor	Low
Potential social impact related to percieved impacts to personal and propoerty rights	Local study area	Possible	Minor	Moderate
Potential social impact related to decision making processes of the proposal	Local study area	Rare	Minimal	Low
Potential social impact related to perceived decision making processes of the proposal	Local study area	Possible	Minor	Moderate
Potential social impact on community values, fears and aspirations	Local study area	Possible	Minor	Moderate
Positive impacts				
Potential employment and business opporuntities for local and regional residents and businesses	Residents and businesses within the local study area, regional study area	Likely	Moderate	High
Potential positive impact to local businesses and business environment associated with construction opportunities	Local study area, regional area, NSW State	Likely	Minor	High
Potential positive impact of new land use which aligns with broader strategic intent and zoning for the area	Local study area	Likely	Minor	High

17.3.2 Operation impacts

This section summarises the potential social impacts during operation of the proposal.

17.3.2.1 Way of life

Liveability

The operation of the proposal is not anticipated to cause any negative impacts to liveability or way of life. There would be minimal negative impacts associated with change in visual amenity, however this would not cause any substantial impacts to way of life.

The results from engagement activities show that there are perceptions regarding the negative impact of living near an EfW facility. This results in a likely perceived negative impact on liveability and way of life.

Employment

The proposal is expected to directly employ about 50 people to operate the EfW facility. This would create job opportunities for the existing and projected population and is expected to positively impact employment and businesses within the local study area and broader region. This impact is assessed to be likely, and minor in consequence, resulting in an overall high positive social impact. The related development assessed in **Chapter 22 Related development** would also create job opportunities.

Traffic and congestion

As summarised in **Chapter 15 Traffic and transport** and **Technical report K**, the operation of the proposal will cause traffic generation. However, the main intersections on Wallgrove Road and Austral Bricks Road would maintain the existing level of service currently available. While operational traffic is likely to increase, there are unlikely to be any significant adverse impacts associated with stress and anxiety, or reduced productivity, leisure or travel time. This impact is assessed to be possible, and minor in consequence, resulting in an overall moderate negative social impact.

Mode of travel

The proposal will seek to promote sustainable travel where possible, including Green Travel Plan providing cycle parking and end-of-trip facilities. This may result in an uptake of sustainable travel choice. This impact may increase levels of sustainable travel in the local study area and is assessed to be possible, and minor in consequence, resulting in an overall moderate positive social impact.

17.3.2.2 Community

Demographic composition and vulnerable groups

The operation of the proposal would provide additional jobs as discussed above. This is unlikely to impact on the demographic composition of the area given the existing working profile. It is not anticipated that, in operation, the proposal will have any broader impacts on the socio-demographic profile of the local study area or wider region.

Business community

The proposal would align with other businesses in the area, which are predominantly industrial, resulting in a likely, if minor, positive impact. It would provide a supportive environment for existing local businesses and the creation of new businesses, in reinforcing the local study area's character as an area for sustainable industry. The proposal would also provide essential infrastructure to support local, regional and State-wide business activities.

During operation, there are no anticipated direct impacts of the proposal on businesses within the local study area. Business receptors may experience some amenity and access impacts from operation, as summarised in the amenity section. These may impact on business operations, worker productivity and/or wellbeing of staff. However, these impacts are expected to be minimal, noting the presence of other amenity impact generating users (for example, the M7) in the local study area and the distance of the site from businesses. This impact is assessed to be possible, and minimal in consequence, resulting in an overall low negative social impact.

17.3.2.3 Access to and use of infrastructure, services and facilities

Social infrastructure and facilities

When operational, the proposal will not directly impact on any of the identified social infrastructure within the local study area. These impacts are assessed to be rare, and minimal in consequence, resulting in an overall low negative social impact.

The proposal will provide an EfW facility that will play a regional and State-wide role in waste management. It will help support the achievement of landfill diversion targets, preserve the limited landfill capacity available for the disposal of materials with no other management option and delay the need to establish new landfill sites. This results in a high positive impact.

Utilities infrastructure

There will be no significant impacts to public utilities and services, assessed to be unlikely and minimal, resulting in overall low negative social impact.

17.3.2.4 Health and wellbeing

Human health risk

A human health risk assessment as summarised in **Chapter 9 Human health risk** and detailed in **Technical report B** has been prepared, and it concludes that there are no unacceptable health risks for criteria associated with pollutant levels (NO_x, SO_x, CO, $PM_{2.5}$, PM_{10}) due to the proposal alone or in changing the background/existing levels. The assessment also identified no unacceptable risks associated with air quality from short-term exposures, long-term exposures, for rainwater tanks or for Prospect Reservoir. The assessment concludes that proposal traffic generation would result in minimal changes to the existing air quality, so no change in health impacts is expected.

Overall health risks are anticipated to be rare and minimal, resulting in a low impact. Continuous monitoring of proposal emissions will avoid impacts to human health.

Air quality impacts

The air quality impact assessment in **Chapter 8 Air quality and odour** and **Technical report A** found that the proposal can operate without causing any significant air quality impact to any sensitive receivers at or beyond the proposal boundary. All of the air pollutant results show levels below the applicable criteria, apart from cumulative ground level $PM_{2.5}$ and PM_{10} concentrations, due to the existing background levels which already exceed the criteria (as occurs across much of NSW). However, the predicted proposal contribution to concentrations is small and would not result in any discernible or measurable impact.

Perceived air quality and health impacts

However, while actual impacts are avoided, the impacts of air pollution as a result of the proposal are still a main concern of the community. There is potential for perceived impacts which can cause stress and anxiety to community members. This perceived impact is assessed to be possible, and moderate in consequence, resulting in an overall high negative social impact.

Hazard and risk

The preliminary hazard analysis (**Technical report J**, summarised in **Chapter 14 Hazards and risks)** identifies a range of potential risks, including fires, spills and dust explosions. Five hazards are identified as having potential to pose extremely rare but significant offsite risks. The worst being the release of ammonium hydroxide due to catastrophic failure of the ammonium hydroxide tank. From a social perspective, these present a risk to the health and wellbeing of both employees on site, and those in the immediate vicinity of the site. The proposal has been designed with best practice measures to maximise safety and minimise risk. Several additional mitigation measures have been identified, as set out in **Chapter 14 Hazards and risks** to respond particularly to the risks identified. This impact is assessed to be rare, but catastrophic in consequence, resulting in an overall high negative social impact.

17.3.2.5 Surroundings

Visual amenity

The greatest change to the existing environment will be the permanent addition of the facility – the buildings, stack and plume – to the landscape. While this is generally considered to be consistent with the industrial character of the area, and has incorporated design measures to mitigate visual impact, the proposal, particularly the stack and the plumes, would be visible above vegetation. The rural residential character of Horsley Park and views from the area would be obstructed, as well as views from Moonrise Lookout within the Western Sydney Parklands. The proposal would also be highly visible from the shared cycle path adjacent to the M7. The change in views from rural landscape areas may impact on community views from and overall appreciation of the area. This impact is assessed to be possible, and minor in consequence, resulting in an overall moderate negative social impact.

Noise impacts

Noise impacts have the potential to cause annoyance and sleep disturbances and can result in people changing their habits at home, including keeping doors and windows closed and not using outdoor areas as much. The proposal will emit noise from operating plant equipment during operation. The Operational Noise and Vibration Assessment (**Technical report I**) states that the site is predicted to comply with noise criteria at all nearby receivers during standard meteorological conditions and identifies only one minor exceedance at night in enhanced meteorological conditions. Therefore, social impact associated with operational noise is assessed to be possible, and minor in consequence, resulting in an overall moderate negative social impact.

Land use and zoning

The proposed development is consistent with the surrounding land uses, which are characterised by industrial and transport infrastructure. No additional direct land use or zoning impacts are expected during operation. The proposal would align with other land uses in the area being predominantly industrial activities.
The proposal would also offer essential infrastructure to support local, regional and State-wide business activities. This impact is assessed to be likely, and moderate in consequence, resulting in an overall high positive social impact. No impacts to future development within the local study area are anticipated.

17.3.2.6 Personal and property rights

There are no anticipated impacts to personal and property rights, however, residents and property owners in the areas surrounding the site may perceive that the establishment of an EfW facility in their region may impact on liveability and in turn, reduce property values. The perceived impacts are expected to be possible and minor consequence, resulting in a moderate impact.

17.3.2.7 Decision-making systems

There would be no impact on decision-making systems once the proposal is operation. It is noted that the community has expressed concerns around regulating the operation of the facility and accountability. There is potential for possible and minor perceived negative impact on decision-making systems, resulting in an overall moderate impact.

17.3.2.8 Fears and aspirations

No significant negative impacts are anticipated to community values as a result of the proposal. However, there are perceived impacts including general community concerns about living near an EfW facility. Concerns relate to impacts on air quality, traffic, the environment, and the safety of the facility. Efforts have been made throughout the engagement activities to reduce perceived impacts and address community concerns over perceived impacts. However, there may be some possible perceived minor negative impacts.

The proposal would result in several beneficial impacts for the community within the local study area and wider region. Benefits that may be of importance to the community include reduced emissions, generation of electricity, reduced waste disposal costs for councils and businesses, and benefits of reduced landfill, including reduced greenhouses gas emissions, and amenity loss. This impact is assessed to be likely, and minor in consequence, resulting in an overall high positive social impact.

The proposal is also expected to benefit encouraging sustainable waste management practices which align with community aspirations to be environmentally considerate. The proposal includes a visitor and education centre which would benefit local and regional schools and education facilities by offering a local learning destination and acting to educate the broader region on waste management.

17.3.2.9 Summary of operation impacts

Table 17.3 below summarises social impacts from the operation of the proposal. Any negative operation impacts would be medium to low. The proposal would have beneficial impacts on long-term employment opportunities, a shift towards more sustainable initiatives and community values, and providing key infrastructure for the community.

Table 17.3: Summary of operation impacts

Impact	Extent of impact	Impact		
		Likelihood	Consequence	Impact Rating
Negative impacts				
Potential impact on livability due to changes in amenity	Local study area and regional	Unlikely	Minimal	Low
Potential perceived reduction in livability due to changes in amenity	Local study area and regional	Likely	Minor	Moderate
Potential impact to way of life due to increase in traffic and congestion	Residents and communities within the local study area, commuters from the regional area	Possible	Minor	Moderate
Potential impact on way of life related to changes to mode of travel	Residents and communities within the local study area, commuters from the regional area	Rare	Minimal	Low
Potential impact on community demographic composition and vulnerable groups	Local study area and regional area	Unlikely	Minimal	Low
Potential social impact to local businesses and business environment associated with amenity and traffic impacts	Local study area	Possible	Minimal	Low

Impact	Extent of impact	Impact		
		Likelihood	Consequence	Impact Rating
Potential social impact to social infrastructure and community facilities	Residents and communities within the local study area	Rare	Minimal	Low
Potential social impact to utilities infrastrcuture and provision	Local study area	Rare	Minimal	Low
Potential social impact to human health risk	Local study area	Rare	Minimal	Low
Potential social impact fur to changes in local amenity associated with increased air emissions	Local study area	Unlikely	Minor	Low
Potential perceived social impact related to perceived health impacts associated with air emissions	Local study area	Possible	Moderate	High
Social impact associated with hazard risks associated with fuel and chemicals stored on site	Local study area (immediate vicinity of the site)	Rate	Catastrophic	High
Potential social impact due to changes in landscape and visual changes	Local study area	Possible	Minor	Moderate
Potential social impact due to increased noise emissions	Local study area	Possible	Minor	Moderate
Potential impacts to current land use and land use zoning intent	Local study area	Unlikely	Minimal	Low
Potential percieved social impacts related to personal and property rights	Local study area	Possible	Minor	Moderate
Potential perceived social impact related to decision making processes of the proposal	Local study area	Possible	Minor	Moderate
Potential social impact on community fears and aspirations	Local study area	Possible	Minor	Moderate

Impact	Extent of impact	Impact		
		Likelihood	Consequence	Impact Rating
Positive impacts				
Potential employment and business opportunities for local and regional residentis and businesses	Residents and businesses within the local study area, regional area	Likely	Minor	High
Potential social positive impact of shift towards more sustianabile travel	Residents and communities within the local study area, commuters from the regional area	Possible	Minor	Moderate
Potential positive impact to local businesses and busines enviornment through support for industry	Local study area, regional area, NSW State	Likely	Minor	High
Potential positive impact for the porposal as a key piece of infrastructure for the community	Local study area, regional area, NSW State	Likely	Moderate	High
Potential positive impact of new land use which aligns with broader strategic intent and zoning for the area	Local study area	Likely	Minor	High
Potential social postivie impact with regard ot sustainability and community aspirations	Residents within the local study area and regional area	Likely	Moderate	High

17.4 Mitigation

This section outlines proposed mitigation and management measures regarding the potential social impacts of the proposal during construction and operation. There are some potential adverse impacts which could be reduced, and beneficial impacts which could be enhanced through the implementation of mitigation and management measures. **Table 17.4** summarises the mitigation and management measures proposed to respond to the identified social impacts of the proposal.

Some of the social impacts identified result from broader impacts associated with noise, air quality, visual and traffic. In such instances, the relevant technical assessments have come up with relevant mitigation and management measures. These broader measures will also minimise social impacts, associated with health, air quality, noise, visual and traffic impacts.

Table 17.4: Social impact mitigation and management measures

ID	Potential impact	Mitigation/management
Construction mitigation measures		
SO1	Various negative social impacts associated with construction of the proposal on local residents, businesses, developers and other sensitive receptors.	A targeted stakeholder and community engagement strategy and program will offer regular proposal updates, and liaison with sensitive receptors regarding impacts. A Community Reference Group (CRG) will be formed during construction and function across the life of the proposal. The purpose of the CRG will be to help long-term relationships with the community, providing a forum for genuine discussion of construction and operation of the facility, community concerns, information requests, and local initiatives and partnerships.
SO2	Positive social impact of construction employment opportunities within the local study area and wider region.	A construction skills and employment strategy will support employment of local people in construction and boost the construction business base in the local study area and wider region.
Operation mitigation measures		
SO3	Various negative social impacts associated with operation of the proposal on local residents, businesses, developers and other sensitive receptors.	A targeted stakeholder and community engagement strategy and program including the CRG will educate the community on perceived impacts, offer information regarding the EfW process, handle and respond to complaints, and engage with vulnerable groups and sensitive receptors. The CRG will also manage the allocation of a community investment fund in line with an agreed governance framework. Funding contributions are yet to be determined but are likely to be towards initiatives such as local sporting infrastructure, community facilities and environmental areas such as tree plantings.

17.5 Residual impact assessment

Based on the application of the social specific mitigation measures, and broader mitigation measures in other technical assessments, the residual impacts of the proposal are summarised in **Table 17.5** and **Table 17.6** below.

Table 17.5: Residual impacts during construction

Impact	Extent of impact	Impact		
		Likelihood	Consequence	Impact Rating
Negative impacts				
Potential impact on livability due to construction dust, noise and vibration	Local study area and regional	Unlikely	Minimal	Low
Potential impact on way of life due to incrase in traffic and congestion	Residents and communities within the local study area, commuters from the regional area	Possible	Minimal	Low
Potential impact on way of life related to changes to mode of travel	Residential and communities within the local study area, commuters from the regional area	Rate	Minimal	Low
Potential impact on demographic composition and vulnerable groups	Local study area and regional	Unlikely	Minimal	Low
Potential social impact to local businesses and business environment associated with amenity and traffic impacts	Local study area	Possible	Minimal	Low
Potential social impact due to changes to access and use of social infrastructure and community facilities	Residents and communities within the local study area	Rare	Minimal	Low
Potential social impact due to changes to utilties and infrastructure and provision	Local study area	Possible	Minor	Moderate
Potential social impact due to increased air emissions	Local study area	Unlikely	Minimal	Low
Potential social impact due to landscape and visual changes	Local study area	Possible	Minimal	Low
Potential social impact due to increased noise emissions	Local study area	Possible	Minor	Moderate
Potential impact to current land uses and operations	Local study area	Unlikely	Minimal	Low
Potential social impact related to personal and property rights	Local study area	Unlikely	Minor	Low
Potential social impact related to percieved impacts to personal and property rights	Local study area	Possible	Minimal	Low

Impact	Extent of impact	Impact		
		Likelihood	Consequence	Impact Rating
Potential social impact related to decision making processes of the proposal	Local study area	Rare	Minimal	Low
Potential social impact related to perceived decision making processes of the proposal	Local study area	Possible	Minimal	Low
Potential social impact on community values, fears and aspirations	Local study area	Possible	Minimal	Low
Positive impacts				
Potential employment and business opporuntities for local and regional residents and businesses	Residents and businesses within the local study area, regional study area	Almost certain	Moderate	High
Potential positive impact to local businesses and business environment associated with construction opportunities	Local study area, regional area, NSW State	Likely	Minor	High
Potential positive impact of new land use which aligns with broader strategic intent and zoning for the area	Local study area	Likely	Minor	High

Table 17.6: Residential impacts during operation

Impact	Extent of impact	Impact		
		Likelihood	Consequence	Impact Rating
Negative impacts				
Potential impact on livability due to changes in amenity	Local study area and regional	Unlikely	Minimal	Low
Potential perceived reduction in livability due to changes in amenity	Local study area and regional	Possible	Minimal	Low
Potential impact to way of life due to increase in traffic and congestion	Residents and communities within the local study area, commuters from the regional area	Possible	Minor	Moderate

Impact	Extent of impact	Impact		
		Likelihood	Consequence	Impact Rating
Potential impact on way of life related to changes to mode of travel	Residents and communities within the local study area, commuters from the regional area	Rare	Minimal	Low
Potential impact on community demographic composition and vulnerable groups	Local study area and regional area	Unlikely	Minimal	Low
Potential social impact to local businesses and business environment associated with amenity and traffic impacts	Local study area	Possible	Minimal	Low
Potential social impact to social infrastructure and community facilities	Residents and communities within the local study area	Rare	Minimal	Low
Potential social impact to utilities infrastructure and provision	Local study area	Rare	Minimal	Low
Potential social impact from human health risk	Local study area	Rare	Minimal	Low
Potential social impact from changes in local amenity associated with increased air emissions	Local study area	Unlikely	Minor	Low
Potential perceived social impact related to health impacts associated with air emissions	Local study area	Possible	Minor	Moderate
Potential social impact of hazard risks associated with fuel and chemicals stored on site	Local study area (immediate vicinity of the site)	Rate	Catastrophic	High
Potential social impact due to changes in landscape and visual changes	Local study area	Possible	Minimal	Low
Potential social impact due to increased noise emissions	Local study area	Possible	Minor	Moderate
Potential impacts to current land use and land use zoning intent	Local study area	Unlikely	Minimal	Low
Potential percieved social impacts related to personal and property rights	Local study area	Possible	Minimal	Low

Impact	Extent of impact	Impact		
		Likelihood	Consequence	Impact Rating
Potential perceived social impact related to decision making processes of the proposal	Local study area	Possible	Minimal	Low
Potential perceived social impact on community fears and aspirations	Local study area	Possible	Minimal	Low
Positive impacts				
Potential employment and business opportunities for local and regional residents and businesses	Residents and businesses within the local study area, regional area	Likely	Minor	High
Potential social positive impact of shift towards more sustainable travel	Residents and communities within the local study area, commuters from the regional area	Possible	Minor	Moderate
Potential positive impact to local businesses and business enviornment through support for industry	Local study area, regional area, NSW State	Likely	Minor	High
Potential positive impact for the porposal as a key piece of infrastructure for the community	Local study area, regional area, NSW State	Likely	Moderate	High
Potential positive impact of new land use which aligns with broader strategic intent and zoning for the area	Local study area	Likely	Minor	High
Potential social postivie impact with regard to sustianability and community aspirations	Residents within the local study area and regional area	Likely	Moderate	High

Chapter 18

Greenhouse gas and energy efficiency

18 Greenhouse gas and energy efficiency

18.1 Introduction

This chapter summarises the potential greenhouse gas (GHG) and energy efficiency impacts from the proposal. A GHG and energy efficiency assessment report has been prepared and included as **Technical Report N**.

The methodology for the GHG and energy efficiency assessment included:

- Finding out the existing environment through analysing climate trends and the link to GHG emissions
- Assessing the impact of the proposal by categorising the GHG sources from the proposal and calculating the potential GHG emissions during construction and operation of the proposal
- Considering energy reduction measures embedded in design and developing mitigation measures to be applied during construction and operation to increase energy efficiency and minimise GHG generation.

The GHG and energy efficiency assessment has been prepared in general accordance with:

- National Greenhouse Accounts (NGA) Factors (Department of Environment and Energy (DoEE), 2019)
- Greenhouse Gas Protocol (World Business Council for Sustainable Development and World Resources Institute)
- AGO Factors and Methods Workbook (Australian Greenhouse Office (AGO), 2004).
- National Greenhouse and Energy Reporting Scheme Measurement, Technical Guidelines for the estimation of emissions by facilities in Australia (Department of the Environment and Energy, 2017).

18.2 Existing environment

This section talks about existing climate trends in Australia, the link between GHG emissions and climate trends, and the role of the waste sector.

18.2.1 Climate trends

18.2.1.1 Australian climate trends

The State of the Climate Report prepared by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) in conjunction with the Bureau of Meteorology (BoM) (2018) analyses recent key climate trends in Australia.

In summary, they observe that Australia's climate has warmed by around 1°C since 1910, sea levels are rising and oceans are becoming more acidic, rainfall has decreased in south-west and south-east Australia, and there has been a long-term increase in extreme fire weather.

Regional climate trends

An 'East coast low' is a low-pressure weather system which forms off the coast of Australia and can result in severe weather to coastal and adjoining areas. An east coast low could result in gale or storm force winds and heavy rainfall, leading to flooding for the western Sydney area. Modelling indicates there will likely be a decrease in the number of winter storms and a small increase in the number of summer storms forming part of the East coast low.[1]

Over the last 12 months, there have been several severe storm events causing significant impact to the greater western Sydney region. These include:

- February 2019 – severe storm event across the greater Sydney region, bringing heavy rain, damaging winds and large hailstones, cutting power to over 5,000 homes in the western Sydney area
- February 2020 – series of mega storms which brought flash flooding, heavy rain, hail and damaging winds to the greater Sydney and Blue Mountains region, causing severe damage rain.

Heatwaves across the greater Sydney region are becoming more regular, with five significant heatwaves recorded since January 2013. Without the coastal sea breeze, prolonged heat has an amplified impact in western Sydney. Statistics from the 2018–19 summer indicates the hottest day recorded was 42.2°C at Penrith Lakes in January 2019. A record run of consecutive hot days of 35°C or higher was experienced at Penrith Lakes, recording nine days in December/January 2019.

[1]Office of Environment and Heritage, 2016.

The western Sydney area is also affected by the heat island effect which is the localised warming of areas due to large paved areas and buildings, with low vegetation cover. The western Sydney area does not receive coastal sea breezes and so is more susceptible to heat island effects.

Figure 18.1 shows a snapshot for Sydney's future climate environment.

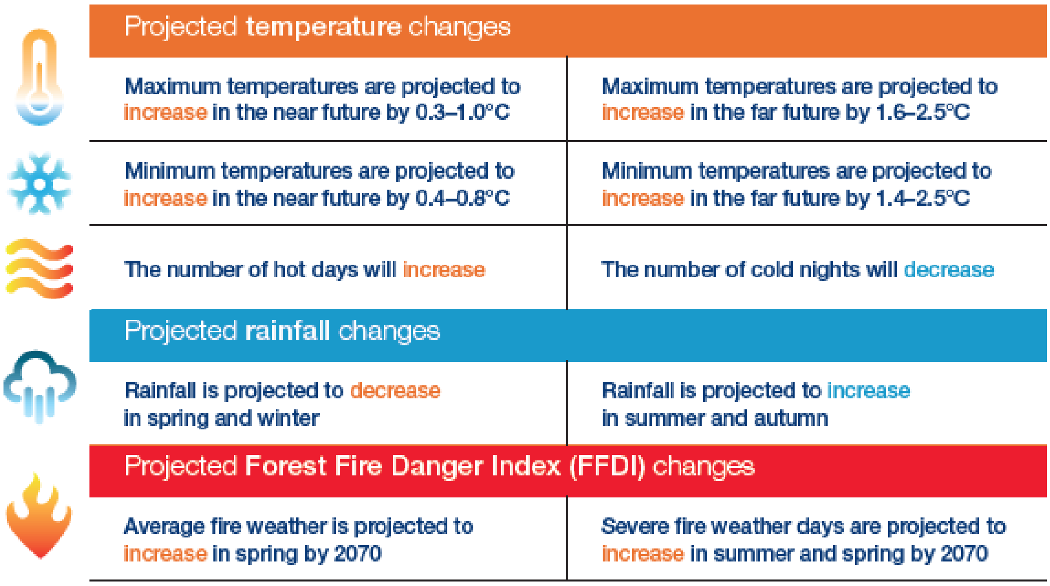


Figure 18.1: Projected changes in Sydney Climate (NARCliM).

18.2.2 GHG emissions

GHG emissions and climate patterns

GHGs are defined as any of the gases whose absorption of solar radiation is responsible for the greenhouse effect. The atmospheric concentrations of some GHGs are being impacted directly by human activities, including carbon dioxide, methane, nitrous oxide and ozone, and synthetic gases such as chlorofluorocarbons and hydrofluorocarbons.

In 2014, the Intergovernmental Panel on Climate Change (IPCC) released its Fifth Assessment Report (AR5) which confirms that human influence on the climate system is clear and growing, with emissions of GHGs the highest in history.

Australian trends in GHG emissions

Australia has two current targets to reduce GHG emissions that have been set under international climate agreements. These include the following:

- In response to the Paris Agreement, the Australian Government has agreed a target of 26–28% reduction in GHG emissions below 2005 levels by 2030.
- Under the Kyoto Protocol, Australia seeks to reduce emissions by 5% below 2000 levels by 2020.

The Australian Government Department of Industry, Science, Energy and Resources (DoISER) issues quarterly reports for GHG emissions in Australia. According to the September 2019 statistics, Australia produced 530.8Mt of carbon dioxide equivalent emissions. This is about a 13.1% reduction since 2005 emissions of 610.6Mt.

Role of the waste industry

According to the National Greenhouse Gas Inventory quarterly update, the waste sector contributed 2.2% of Australia's GHG emissions in September 2019, with little to no difference in trend over the past few years.[2]. In 2017, the NSW waste sector contributed 26.4% to the overall waste sector GHG emissions in Australia[3].

Landfills are a large contributor to the emissions by the waste sector. When organic waste decomposes in landfills, methane and other GHGs are produced as a result. Methane absorbs more heat than carbon dioxide and is therefore a worse contributor to the greenhouse effect.

18.3 Assessment

18.3.1 Potential GHG sources

Clear understanding of the likely GHG emissions associated with a project has the benefit of determining the scale of the emissions and providing a baseline from which to develop and apply GHG reduction measures.

The Greenhouse Gas Protocol 2020 includes three types of emissions.

1. Scope 1 emissions are the release of GHGs into the atmosphere as a direct result of an activity or series of activities, including ancillary activities.
2. Scope 2 emissions are the release of GHGs into the atmosphere as a direct result of one or more activities that generate electricity, heating, cooling or steam that is consumed by the activity but do not form part of the activity.
3. Scope 3 emissions are all other indirect emissions that arise because of an organisation's activities, but occur outside its boundaries, from sources that it does not own or control.

[2] DoISER, 2019a
[3] DoISER, 2019b

As per the Greenhouse Gas Protocol 2020, the potential GHG sources from the proposal are categorised as follows:

- Scope 1: Emissions associated with the thermal treatment of waste and the onsite fuel combustion during both construction (plant and machinery) and operations (plant, and stationary and mobile onsite machinery)
- Scope 2: Electricity imported from the grid and consumed on site
- Scope 3: Transportation of waste to the site and transportation of by-products from the site for offsite disposal, employees commuting to and from the site, electricity exported to the grid from the EfW facility, and avoidance of methane generation as result of diversion of waste from landfill.

Table 2 of **Technical Report N** shows a full list of greenhouse gas emission sources and the estimated quantities.

18.3.2 Construction impacts

Construction emissions

The construction of the proposal would result in the addition of about 4,073t CO_2-e to the atmosphere. Detailed calculations are available in Appendix A of **Technical Report N**. Greenhouse gas emissions resulting from construction works will be generated through the clearing of vegetation for the proposal footprint, and operation of vehicles and machinery during construction works, as shown in **Table 18.1.**

Table 18.1: Construction emissions

Emission source	Quantity	Units	Emission Factor	Total Emissions (t CO_2-e)
Construction machinery – stationary equipment	1,100	kL	2.71	2,981
Vegetation clearing	298	t C	3.67	1,092
Total construction GHG emissions				**4,073**

18.3.3 Operation impacts

First year operation emissions (Scope 1, 2 and 3)

Table 18.2 summarises the total emissions from the first year of operation of the proposal. Detailed calculations are available in Appendix A of **Technical Report N**. The ongoing operations of the proposal would result in indicative generation of 321,408t CO_2-e over the first year of operation of the EfW facility.

Table 18.2: Gross emissions from the first year of operation of the proposal[4]

Emission source	Quantity	Units	Emission factor	Total emissions (t CO_2-e)
Scope 1				
Thermal treatment of waste	500,000	tpa	-	307,431
Onsite fuel combustion (stationary)	2,700	kL	2.710	7,316
Onsite fuel combustion (mobile)	31	kL	2.721	85
Scope 2				
Electricity imported from grid	536,000	kWh	0.73[1]	393
Scope 3				
Employee commute to/from the site	91	kL	2.384	218
Transport of waste to site	1,658	kL	2.721	4,511
Transport of by-products from site	535	kL	2.721	1,455
Gross GHG emissions (indicative of first year)				**321,408**

The proportion of waste type is likely to change over the facilities lifetime, with introduction of new technologies, change in policy and change in consumer behaviour. So, the carbon emissions for Scope 1 and 2 emissions are predicted to decrease overtime. Scope 3 emissions are from vehicle emissions during the transport of waste and employees. The Scope 3 emission trends are dependent on wider technological advances and therefore are outside of the proposal's control.

Electricity export to grid (Scope 2)

As shown in **Table 18.2** above, the proposal will import 536MWh/year for the operation of the facility. Through the thermal treatment of waste that would otherwise be sent to landfill, the WSERRC will generate a nominal equivalent electrical output exported to the grid of 424,000MWh/year. This will result in a reduction in GHG emissions of around 310,731t CO_2-e in the first year of operations.

It is noted that the EfW process would generate up to 58MW of base load electricity with a parasitic load between 3MW and 5MW resulting in a maximum net output of up to 55MW to the electricity grid equal to 440,000MWh/year. However, the assumption made for the GHG calculations have been based on a parasitic load of 5MW meaning a net output of 53MW to the electricity grid, which is equal to 424,000MWh.

[4] The grid carbon factor at start up (year 2024) was based on current factors for 2019, considering the rate of historic decline, with interpolation of estimated emission projections based on historic data and past decline. The assumptions for these interpolations are listed in Appendix A of Technical report N.

Diversion of waste to landfill (Scope 3)

The diversion of waste which would otherwise be disposed to landfill will result in the reduction of methane gases produced during the decomposition process of landfilled waste.

Calculations have been carried out to determine the comparable emissions generated from disposal of the same volume of waste to landfill (500,000tpa). Calculations assumed that 46.2% of methane was captured. This is based on the average Australian landfill operations from the Australian Lifecycle Inventory Database of the Australian Lifecycle Assessment Society and a split of municipal solid waste (MSW) and commercial and industrial (C&I) (30:70) as per the short-term feedstock strategy for the WSERRC, which is detailed in **Chapter 5 EfW policy**. Based on the alternative disposal of waste to landfill, equivalent carbon emissions were equal to 401,192t CO_2-e/year.

The management and treatment of waste close to the source of generation (within the western Sydney region), promotes the proximity principle by reducing transport impacts and associated GHG emissions relating to the haulage of waste to further distances such as Woodlawn, some 200km south of Sydney. This would contribute to a further net reduction in overall GHG emissions, that has not been included in the overall calculations.

18.3.3.1 Net GHG emissions balance

Table 18.3 shows the net GHG emissions balance from the operation of the proposal considering the first-year operation emissions, the electricity export to grid and the diversion of waste to landfill. Appendix A of **Technical Report N** has further detail of these calculations.

Table 18.3: Net GHG emissions balance

Emission source	Quantity	Units	Emission Scope	Emission Factor[5]	Total Emissions (t CO_2-e)
Operating GHG emissions (indicative of first year) (Scope 1, 2 and 3)					321,408
Diversion of waste to landfill	500,000	tpa	Scope 3	0.82 (MSW) 0.79 (C&I)	-123,035 -278,157
Export of energy back to the electricity grid	424,000	MWh/year	Scope 2	0.73	-310,731
Net indicative GHG emissions (indicative of first year of operations)					**-390,515**

[5] Emission factors for MSW and C&I waste were based on actual data from quarterly waste audit completed at Cleanaway's Erskine Park Waste Transfer Station.

As noted above, the DoISER issues quarterly reports for GHG emissions in Australia. According to the September 2019 statistics, Australia produced 530.8Mt CO_2-e. In comparison, the GHG emissions from the waste sector accounted for 2.2% or 11.8Mt CO_2-e of this total. While operation of the facility will generate GHG emissions, consideration of factors including export of electricity back to the grid and the diversion of the equivalent waste which would otherwise be sent to landfill, results in the overall net reduction of GHG emissions by around 390,515t CO_2-e which would reduce Australia's overall emissions by less than 1% and the waste sector emissions by about 3%.

18.3.3.2 Climate impacts

As shown in **Table 18.3**, the operation of the proposal achieves a net reduction in GHG emissions. The proposal will divert waste from landfill, and so will reduce the possibility of methane emissions resulting from landfill. Part of the electricity generated from the proposal qualifies as renewable and displaces fossil fuel-based energy supplied to the grid, which also contributes to emissions reduction.

The proposal supports Australia's efforts to mitigate climate change by reducing GHG emissions and transitioning to a low carbon economy.

18.4 Mitigation

18.4.1 Design measures to reduce impacts

Several energy efficient measures have been considered and incorporated in the design of the proposal, with further measures to be applied during operation of the EfW facility. These measures will make sure operations maximise resource and energy recovery, thus maximising overall energy efficiency and reducing unnecessary GHG emissions. **Table 18.4** below outlines these design-embedded mitigation measures.

Table 18.4 also describes the measures that would be employed to mitigate against, manage and monitor the predicted GHG and energy efficiency impacts during construction and operation of the proposal.

Table 18.4: GHG and energy efficiency mitigation measures

ID	Potential impact	Proposed mitigation
Design embedded mitigation measures		
GHG1	Poor energy efficiency and fuel consumption	The proposal will use its own energy production to power the facility itself before exporting the remaining electricity generation to the grid.
GHG2		The plant is designed to run at 'high steam conditions' which refer to the temperature and pressure of the steam that is generated by the boiler and is used to drive the turbine to generate electricity. High steam conditions maximise the recovery of energy from the flue gases and therefore maximise energy efficiency.
GHG3		Variable Speed Drives (VSDs) will be specified for large motors driving fans and pumps to reduce energy consumption within the plant. This effectively decreases the electricity consumed by the plant and therefore increases the amount of electricity that can be exported to the electricity grid in comparison to the case where single speed drives are used.
GHG4		All plant systems and equipment will be accurately specified and sized so they operate at optimal design point during normal operations. This means that equipment will operate efficiently and therefore energy efficiency of the overall facility will be increased.
GHG5		Use of energy efficient motors.
GHG6		Use of mechanical/pneumatic rapping systems to do online cleaning to the boiler rather than soot blowers which would utilize steam which could otherwise been used for electricity generation.
GHG7		Efficient design of steam turbine with multiple steam extraction points so that all internal process demands can be met with extracted steam for all load conditions.
GHG8		Maximizing natural ventilation of process plant areas where possible to minimize use of forced ventilation.
GHG9		Sub-metering of all electricity distribution at a system level to monitor usage and identify high consumers and opportunities for future improvement.
GHG10	Energy and materials consumed by the administration building and visitor and education centre	Location of the Operations/Administration areas in the main facility, not a stand-alone building which reduces the overall volume of materials needed for construction.
GHG11		Consideration of the orientation of the buildings and glazed facades to limit excess solar gain thus reducing the need for excessive cooling. Use of glazing to balance solar gain with provision of natural light will also be carefully considered to reduce the energy usage from electrical lighting.
GHG12		Use of insulated façade materials to reduce energy consumption for heating and cooling when compared to a non-insulated facility.

ID	Potential impact	Proposed mitigation
GHG13	Energy and materials consumed by the proposed buildings and infrastructure onsite	Materials will be carefully selected, considering life cycle impacts and embedded carbon in materials.
Construction mitigation measures		
GHG14	Fuel consumption Vegetation removal	The CEMP will include appropriate measures to be applied to optimise construction machinery and fuel usage, and the clearing of vegetation will be minimised as much as practical for the construction footprint.
Operation mitigation measures		
GHG15	Poor energy efficiency and fuel consumption	A site-specific Environmental Management Plan will be prepared and applied as part of the OEMP. This will outline energy efficient procedures so that plant operation is optimised, including the logistics to reduce fuel usage. This plan will be continuously reviewed and audited.
GHG16		The OEMP will include measures so that BAT are reviewed, and so opportunities are identified and applied where future technologies may further reduce energy use.
GHG17		The operator will continue to investigate whether the installation of a heat/low pressure steam offtake is possible to allow the facility to operate in a Combined Heat and Power mode which would increase the overall energy efficiency of the facility. Such opportunities will be assessed periodically.

Chapter 19

Heritage

19 Heritage

19.1 Introduction

This chapter summarises the potential Aboriginal and non-Aboriginal heritage impacts resulting from the proposal.

An Aboriginal Cultural Heritage Assessment Report (ACHAR) has been prepared by Kelleher Nightingale to assess the potential for any impacts on Aboriginal cultural heritage associated with the proposal. The ACHAR is included as **Technical report O**.

A preliminary Aboriginal and non-Aboriginal heritage assessment was prepared by Kelleher Nightingale in 2019 to support the Scoping Report stage of this proposal. The preliminary Aboriginal and non-Aboriginal heritage report is included as **Technical report O1**.

The methodology for the ACHAR included:

- Clear understanding of the existing environment and value through a review of previous archaeological investigations and proposal-specific Aboriginal community consultation
- Assessing the impact of the proposal on the existing environment and heritage values, including assessing the significance of cultural heritage values for First Australians who have a cultural association with the land
- Development of mitigation measures.

The ACHAR report was prepared following the below guidelines:

- Code of practice for archaeological investigation of Aboriginal objects in NSW (Department of Environment, Climate Change and Water (DECCW), 2010)
- Guide to investigation, assessing and reporting on Aboriginal cultural heritage in NSW (Office of Environment and Heritage (OEH), 2011)
- Aboriginal cultural heritage consultation requirements for proponents 2010 (DECCW, 2010).

For the non-Aboriginal heritage assessment, heritage registers have been reviewed to identify any known State and local heritage-listed items in or close to the site.

Below is a summary of the investigations and main findings.

19.2 Existing environment

19.2.1 Vegetation and land use history

The proposal site is located on the Cumberland Plain, a large low-lying and gently undulating physiographic region of the Sydney Basin. The distribution of native vegetation within the Cumberland Plain has been impacted by historic and contemporary European land use practices in the region.

Before European land clearance, a mixture of native vegetation communities would have extended across the Cumberland Plain, including woodlands on the slopes and alluvial forests near Reedy Creek. The Cumberland Plain would have served as a habitat for possums and gliders, these would have likely formed a major component of the diet of First Australians.

During the first half of the nineteenth century, Cumberland Plain would have been impacted by increasing British settlement with farming, the creation of several major roads and the development of regional centres.

The proposal site has undergone considerable disturbance because of land clearance, agricultural and light industrial practices, as well as landfill activities. These activities have caused significant disturbance and are detrimental for the preservation of Aboriginal archaeological sites with subsurface deposits.

19.2.2 Previous archaeological studies for Aboriginal heritage

Various archaeological investigations have taken place within the surrounding area of the proposal site within the last 30 years.

Archaeological investigations were conducted during the planning of an extension to existing waste depot facilities which encompassed the area between the eastern boundary of the WSERRC proposal site and the western bank of Eastern Creek[1]. The test excavation recovered 69 artefacts from 18 of the 30 test pits excavated. The artefacts were predominantly recovered from areas located on the flat land adjacent to Eastern Creek and the crest of the low-lying spur overlooking a marsh and Eastern Creek. At the test pit nearest the proposal area, no Aboriginal artefacts were recovered. An archaeological salvage excavation was later performed about 700m east of the proposal site. A total of 95 artefacts were recovered during the salvage excavation including predominantly unmodified flakes and flake fragments.

[1] MKAS, 1989.

Several archaeological assessments have been carried out immediately west of the proposal site for the Stage 3 release of the SEPP 59[2]. A total of 42 Aboriginal archaeological sites were found. The sites consisted of surface artefact scatters, isolated artefacts and one culturally modified tree. The sites were found on a range of landforms. However, the majority were located on hillslopes or creek banks.

A preliminary archaeological assessment of Aboriginal and non-Aboriginal heritage was made for the current proposal in 2019 by Kelleher Nightingale Consultants (**Technical report O1**). The assessment included a desktop assessment and visual inspection. The desktop assessment found one archaeological site (E8 - AHIMS 45-5-2582) registered as being within the vicinity of the proposal area. However, the coordinates were incorrect, and the site is located about 1km east of the registered location. This report concluded that no Aboriginal archaeological sites have been recorded on the proposal site.

The visual inspection determined that the proposal area had undergone considerable disturbance because of land clearance, agricultural and light industrial practices, as well as landfill activities. These activities would have caused significant disturbance to Aboriginal archaeological sites, if present.

19.2.3 Aboriginal community consultation

Specific Aboriginal community consultation has been conducted in line with the Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (DPIE, 2010), the requirements of Clause 61 of the *National Parks and Wildlife Regulation 2019*, and the SEARs for the proposal. The formal Aboriginal consultation process included:

- Government agency notification letters dated 10 February 2020
- Advertising for registered stakeholders in local media (Blacktown Advocate 4 March 2020)
- Notification of the closing date for registration to be a stakeholder – final closing date 18 March 2020
- Provision of proposal information and proposed cultural heritage assessment methods to registered stakeholders, allowing for a 28-day review period
- Provision of draft Cultural Heritage Assessment Report to registered stakeholders for review, with a minimum 28-day review period
- Ongoing consultation with the local Aboriginal community.

---

[2] JMCHM, 2004.

A total of 25 Aboriginal community individuals and groups registered their interest with the proposal.

Throughout the Aboriginal community consultation conducted to date, stakeholders expressed the following Aboriginal cultural values with the general local area:

- Strong association with the land
- Responsibility to look after the land, including the heritage sites, plants and animals, creeks and the land itself
- Scarred trees
- Artefact sites and landscape features
- Creek lines, particularly Eastern Creek and tributaries
- Native plants and animals
- General concern for burials, as their locations are not always known, and they can be found anywhere.
- The ridgeline could be an indication that there was men's business in this location.

The ACHAR recognises that general area exhibits Aboriginal cultural value. However, consultation with Aboriginal stakeholders did not reveal any specific cultural features associated with the study area.

19.2.4 Non-Aboriginal heritage

In July 2019, Kelleher Nightingale Consulting carried out a non-Aboriginal heritage assessment of the site (Technical Report O1). The assessment included desk-based searches supplemented with a site inspection. The following statutory and non-statutory heritage registers were searched:

- State Heritage Register and State Heritage Inventory
- Heritage Act – s.170 NSW State Agency Heritage Registers
- Blacktown Local Environmental Plan 2015
- SEPP – Western Sydney Parklands 2009
- Australian Heritage Database
- Historic sites of Blacktown City Council (community webpage).

There are no non-Aboriginal items listed on heritage registers for the proposal site, neither were any non-Aboriginal heritage features discovered during the desktop study or site inspection.

In response to a request for input to the SEARs, Heritage NSW stated that no referral to the Heritage Council of NSW is necessary as the site is not listed on the State Heritage Register (SHR), nor is it in the immediate vicinity of any SHR items. Further, the site does not contain any known historical archaeological deposits.

19.3 Assessment

19.3.1 Aboriginal heritage

The assessment of significance is a key step in the process of impact assessment for a proposed activity, as the significance or value of an object, site or place will be reflected in resultant recommendations for conservation, management or mitigation.

The Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (DPIE, 2010) requires a significance assessment according to criteria recognized in the Australia ICOMOS Burra Charter, 1999 (Australia ICOMOS, 1999). The Burra Charter and its accompanying guidelines are considered best practice standard for cultural heritage management, specifically conservation, in Australia. The guidelines to the Burra Charter set out four criteria for the assessment of cultural significance:

- Aesthetic value
- Historic value
- Scientific value
- Social value.

The above criteria are used to determine the cultural value and significance of heritage for the proposal as outlined below:

Social value

- The consultation process revealed that the general local area has cultural heritage value (social value) to the local Aboriginal community. No cultural values have been ascribed to the specific proposal area to date.

Historical value

- Historical research did not return any information regarding specific historical significance within the proposal area. No specific historical significance within the proposal area has been raised by the registered Aboriginal stakeholders to date. Archaeologically, the study area does not contain these values of Aboriginal heritage.

Aesthetic value

- No specific associated aesthetic values have been raised by registered Aboriginal community groups to date. Archaeologically, the proposal area does not contain these values of Aboriginal heritage.

Scientific value

- There are no locations of scientific value within the proposal area.

In summary, there are cultural values (for example, social value) associated with the general local area. However, as there are no known Aboriginal archaeological sites or areas of Aboriginal archaeological potential within the proposal area, the proposal is unlikely to impact on Aboriginal heritage. The proposal area exhibits a very low sensitivity for Aboriginal archaeological sites and high levels of previous disturbance. The archaeological potential of the proposal area is assessed as very low.

19.3.2 Non-Aboriginal heritage

There are no non-Aboriginal heritage features or objects located at the site which could be potentially impacted by the proposal, so there are no impacts on non-Aboriginal heritage.

19.4 Mitigation

As there is very low potential for Aboriginal and non-Aboriginal heritage impacts to arise from the proposal, there are no specific mitigation measures proposed. Standard unexpected finds procedures would be followed as detailed in Section 9.1 of **Technical report O**. This would also be detailed in the Construction Environmental Management Plan (CEMP).

Chapter 20

Utilities and services

20 Utilities and services

20.1 Introduction

This chapter summarises the existing utilities and services on site, any impact the proposal will have on these utilities and services and the proposed servicing strategy for the proposal. While utility and services connections are discussed within this chapter, any works related to utilities and services outside the proposal site are discussed in **Chapter 22 Related development**.

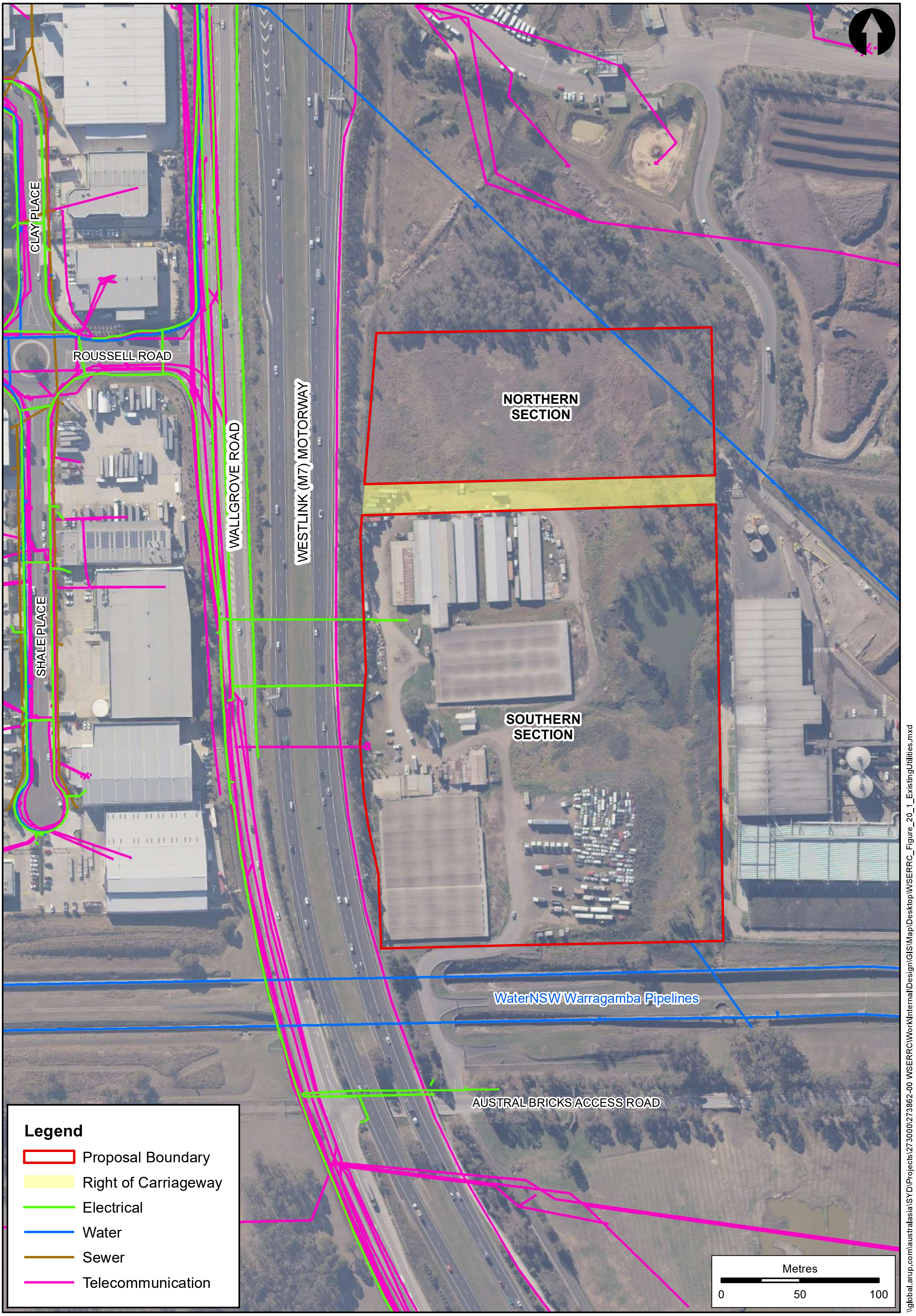
A Utilities and Services Assessment Report **(Technical Report P)** was prepared to outline the impacts of the proposal on existing public utilities within the proposal boundary and describes the proposed servicing strategy for the proposal.

The methodology for the utilities and services assessment involved:

- Identifying the existing utilities and services within the proposal site, by conducting a Dial-Before-You-Dig (DBYD) search, and acquiring other sources of record information and comparing these against the proposed site layout
- Assessing the additional demand that the proposal is placing on the capacity of existing utilities and services infrastructure during construction and operation
- Consulting with all relevant utility and service suppliers
- Defining a preferred point of connection for each service to the proposal site
- Developing mitigation measures.

20.2 Existing environment

Figure 20.1 shows the existing utilities and services near the proposal site.



Service Layer Credits: © Department of Customer Service 2020 DFSI, 2020

Figure 20.1: Existing utilities and services

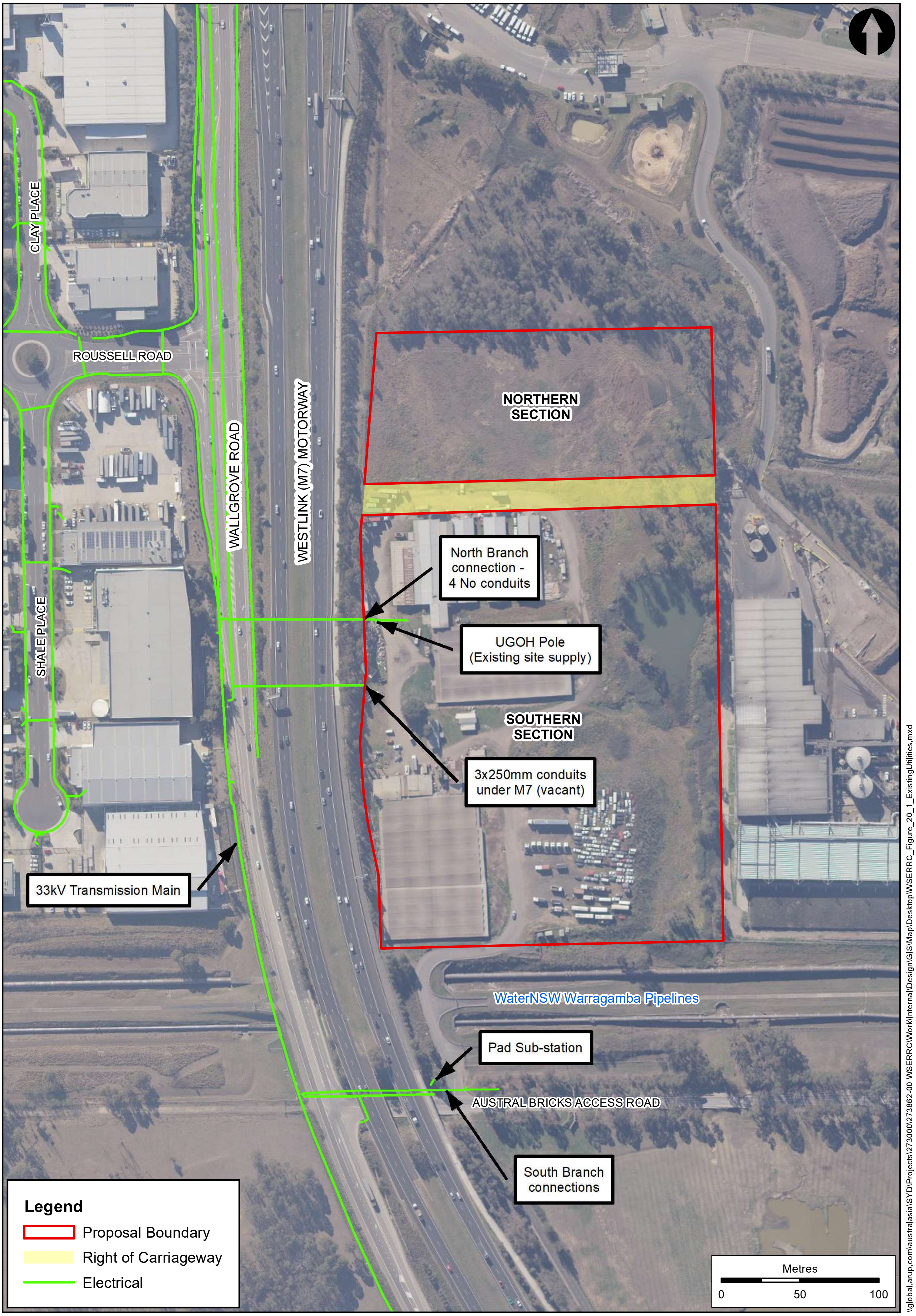
20.2.1 Electrical

Endeavour Energy owns several electrical assets located within and close to the proposal site. These include a 33kV overhead transmission line that runs north-south along Wallgrove Road, and three lines which branch off this main to the east, towards the proposal site, as shown in **Figure 20.2**.

The three lines which branch off the 33kV main include:

- A northern branch with four conduits, located to the west of the site, that crosses underneath Wallgrove Road and the Westlink M7 motorway (the M7). This branch supplies power to the existing buildings on site.
- A middle branch with 3 x 250mm conduits which are vacant, located to the west of the site, that also crosses underneath Wallgrove Road and the M7. This connects to a pad mount substation on the western corner of the access road to the proposal site.
- A southern branch, located to the south of the site, that also crosses underneath the M7.

The site's electricity is currently supplied by the Endeavour Energy high-voltage network, from a nearby 11kV feeder located on the western verge of Wallgrove Road, west of the proposal boundary. The electrical cables that supply the site are contained in conduits from the northern branch (described above) and are buried under Wallgrove Road and the M7. The cables enter the site below ground, at the western boundary, and reach an existing underground to overhead (UGOH) pole. Within the site, existing sheds and outhouses are served from a privately owned overhead electrical network that connects to the main feeder.



Service Layer Credits: © Department of Customer Service 2020 DFSI, 2020

Figure 20.2: Existing electrical assets

20.2.2 Water supply

20.2.2.1 WaterNSW assets

The Warragamba Pipeline corridor is located immediately south of the proposal site, running parallel to the southern boundary. The pipeline corridor is about 50m wide and contains two large above-ground steel cement lined, internal bitumen lined (SCL) (IBL) pipelines – 2.1m diameter for the southern pipe and 3.0m diameter for the northern pipe. These are known as the Warragamba Pipelines, and they are owned and managed by WaterNSW. The pipelines run roughly east-west in alignment.

20.2.2.2 Sydney Water assets

Sydney Water owns an existing 1050mm diameter SCL IBL water main located under the northern portion of the site running north-west to south-east, as shown in **Figure 20.3**. Beyond the proposal site, the water main continues south east and then follows the Warragamba Pipelines corridor east.

20.2.2.3 Site water connection

A 50mm diameter water connection from the WaterNSW 2.1m diameter southern pipeline of the Warragamba Pipelines enters the site at the southeast corner of the proposal site. This connection was used previously as a back-up water supply for the poultry operations, in addition to the farm dam.

20.2.3 Sewer

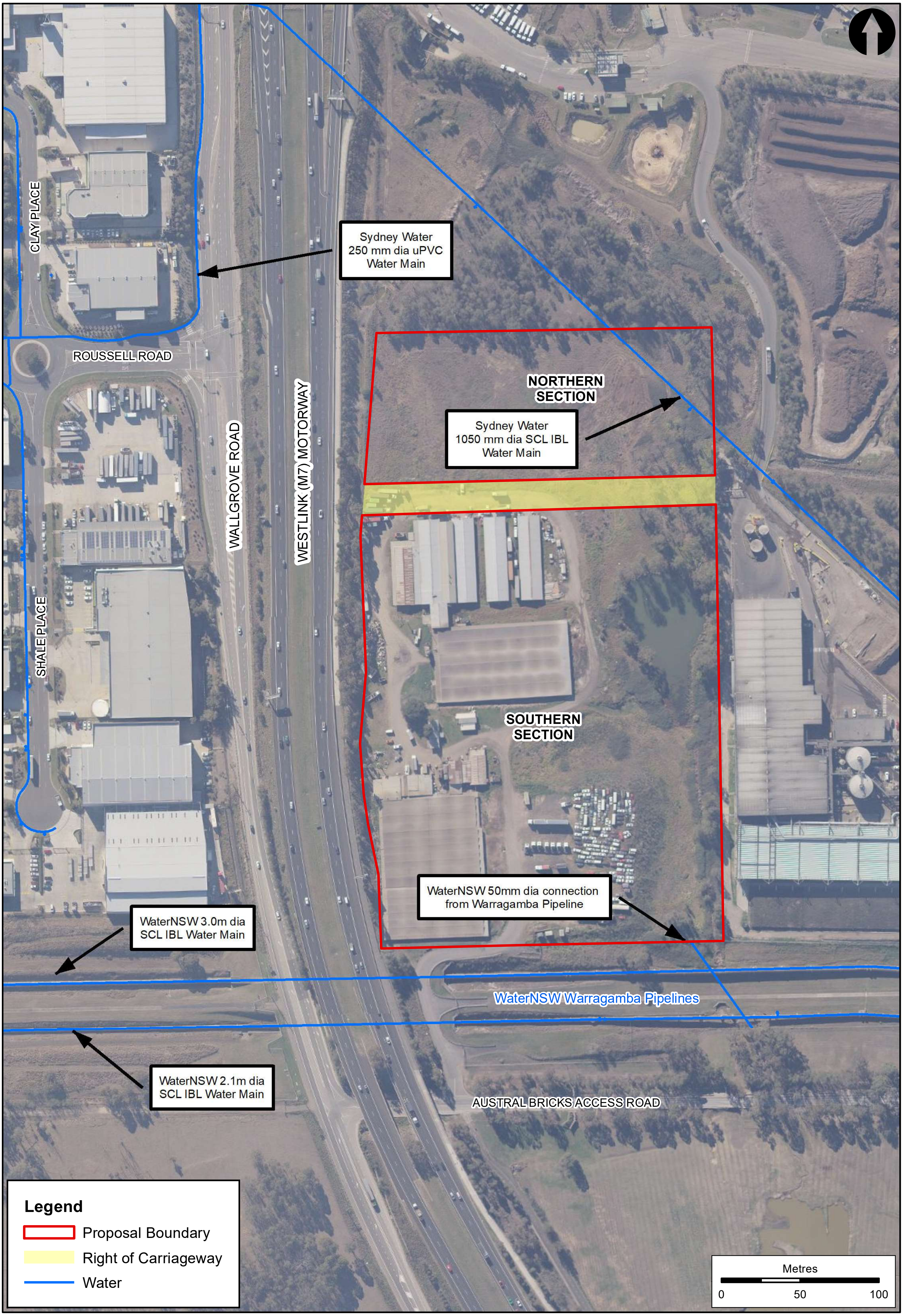
The site is not currently connected to sewer services. Previous activities on the site used septic tanks from which sewage was pumped out periodically and transported off site for treatment/disposal.

There are Sydney Water sewer assets located to the west of the proposal site, as shown in **Figure 20.4** The nearest existing sewer connection point is a 225mm diameter vitrified clay (VC) sewer at the intersection of Clay Place and Roussell Road, west of the proposal site.

20.2.4 Telecommunications

Record information shows there is a Telstra telecommunications connection from Wallgrove Road, under the M7, that terminates in a Telstra pit near the western boundary of the proposal site. It is understood that that this connection shown in **Figure 20.5** has been stopped and is no longer active.

AARNet, NBN, Nextgen, Optus, Superloop, and Uecomm have cable assets located under the eastern side of Wallgrove Road. PIPE Networks (TPG) has cable duct assets located adjacent to the M7 Cycleway. Based on available record information, there is no current telecommunications service to the existing site.

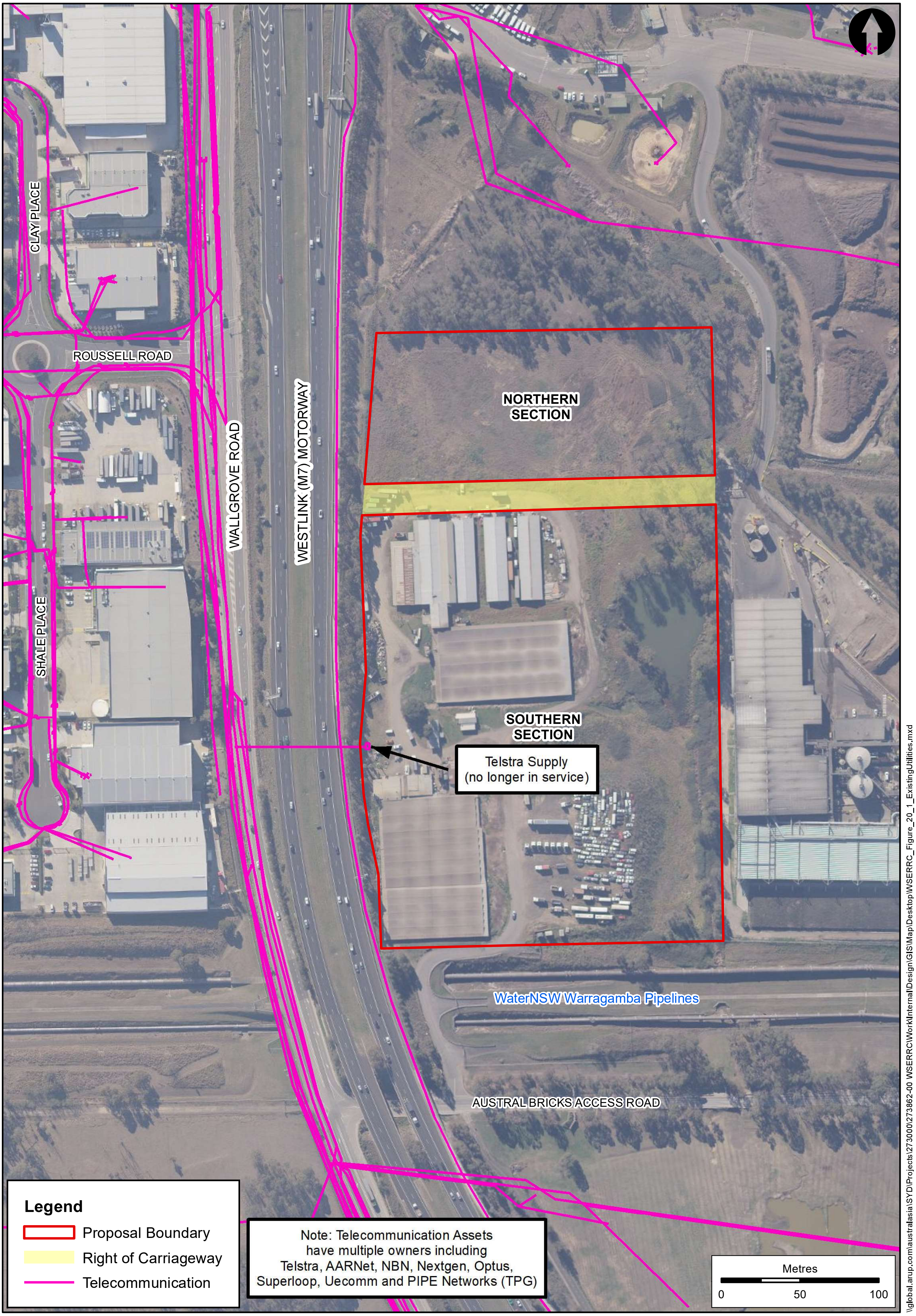


\\global.arup.com\australasia\SYD\Projects\273000\273862-00 WSERRC\Work\Internal\Design\GIS\Map\Desktop\WSERRC_Figure_20_1_ExistingUtilities.mxd

Service Layer Credits: © Department of Customer Service 2020 DFSI, 2020

Figure 20.3: Existing water assets

Figure 20.4: Existing sewer assets



Service Layer Credits: © Department of Customer Service 2020 DFSI, 2020

Figure 20.5: Existing telecommunication assets

20.2.5 Gas

There are no existing gas services near or within the proposal site and no connection is necessary for the proposal.

20.3 Assessment

This section describes the construction and operational impacts on utilities and services resulting from the proposal. The proposal requires offsite works to connect the site to electrical, water, sewer and telecommunications services. These offsite works and any potential associated impacts do not form part of the scope of the proposal and are described in **Chapter 22 Related development**.

20.3.1 Construction impacts

Before the start of demolition works, private networks (internal electrical and water) serving the existing buildings on site will be disconnected, to avoid impacts to the existing networks. The timing and location of utilities and services to be disconnected will be confirmed during detailed design, following further consultation with utility and service suppliers.

To minimise the need for diesel generators and water tanks onsite during construction, the applicant intends to use existing electrical and water services already connected to the proposal site. New temporary septic tanks or wastewater treatment plants, serving the construction compounds, will be used until a permanent connection is established. New temporary conduits and pipework will need to be installed inside the proposal boundary, to direct electricity and water to the temporary compound areas which are subject to discussion and agreement with network operators.

20.3.1.1 Electrical

The existing Endeavour Energy electrical supply is proposed to be retained to supply power for demolition and construction activities until the permanent electrical supply is installed and operational.

The underground to overhead (UGOH) pole that supports the existing electrical supply to the site is located next to the existing poultry shed building and between the two main buildings on the site.

The pole will be disconnected and removed to enable construction of the main EfW facility. The electrical cables will be diverted, before the pole is removed, and re-routed to the temporary construction compound.

Connections associated with the permanent electricity supply for the proposal site will require offsite works which are discussed in **Chapter 22 Related development.**

20.3.1.2 Water supply

Sydney Water assets

There are no existing Sydney Water assets within the southern portion of the proposal site where the construction is proposed. Minimal construction works or changes in level are proposed in the northern portion of the site where the existing Sydney Water water main is located. The proposed works, currently expected to be undertaken where the water main is located, relate to exotic vegetation clearing and replanting. So, the proposal is likely to cause no impact to the existing Sydney Water assets within the proposal boundary.

A new connection to Sydney Water's water infrastructure for potable water supply will involve disruption of existing infrastructure which is live and in use. Community engagement will be conducted as appropriate to keep the community informed of works and potential service/supply disruptions which may impact them.

The proposed connection to the existing Sydney Water main under Wallgrove Road, outside of the proposal boundary, is covered within **Chapter 22 Related development**.

WaterNSW assets

<u>Water supply connection</u>

The existing water supply connection from the Warragamba Pipelines is proposed to be retained during construction to service construction demands. Once the permanent potable water connection to the Sydney Water infrastructure is operational, the existing 50mm diameter pipe connected to the Warragamba Pipelines will be disconnected and removed. Disconnection details will be confirmed during detailed design, following agreement with WaterNSW.

<u>Risk to Warragamba Pipelines</u>

A Warragamba pipelines risk assessment has been completed for the proposal, detailing the risks that the proposal poses to the Warragamba Pipelines and the mitigation and monitoring measures proposed to address these items. A summary of this risk assessment is discussed below. The Warragamba Pipeline Risk Assessment is included as Appendix A of **Technical report P Utilities and Services Assessment**. The proposal will be designed, constructed and operated so that the Guidelines for Development Adjacent to the Upper Canal and Warragamba Pipelines are adhered to.

During the construction of the EfW facility, the equipment to be used near the pipeline will be chosen carefully to avoid vibration impacts. Vibration impacts to the Warragamba Pipeline will be avoided by carrying out a Construction Noise and Vibration Management Plan (CNVMP), which includes a construction vibration monitoring program. The purpose of the monitoring program is to avoid vibration over set criteria. Trigger thresholds would be established which, when exceeded would result in the cessation of any work. Work, potentially implementing alternative construction methods, would only ensue again once there was confidence that vibration impacts could be avoided. Further detail is available in **Technical report I Noise and Vibration Impact Assessment**.

The proposed high-voltage cables will be buried underground, in line with Service and Installation Rules of NSW and Endeavour Energy requirements. The cable routes will be positioned at a minimum of 20m from the pipeline corridor to reduce the risk of earth potential rise, and step and touch potentials on the metallic structures in the Pipelines Corridor, and to reduce corrosion potential of the Warragamba Pipelines by low-frequency induction from the generation of electricity by the EfW facility.

Any impacts from accidental spills or discharge of chemicals or hydrocarbons, such as fuels and oils in vehicles and/or equipment, will be managed by a spill management plan.

Erosion of soil and sedimentation through stormwater runoff and as result of earthworks and potential vegetation removal, will be managed through erosion and sediment control measures, to avoid any potential impact to the Warragamba Pipelines.

WaterNSW has access over to the pipeline corridor via two access tracks off the existing access road. The Warragamba Pipeline – Technical Paper and Risk Assessment outlines the proposed site access construction works. The works will be staged, to allow access from at least one of the access ramps to the Warragamba pipelines and pipelines corridor at all times. WaterNSW will be consulted before any works proceeding, and dates for construction will need to be agreed. Further detail will be developed during design development to work out and agree an approvals route. The proposed site access construction works do not form part of this proposal and are considered related development. This is discussed in more detail in **Chapter 22 Related development** and are subject to final detailed design.

20.3.1.3 Sewer

There are no existing Sydney Water sewer assets within the proposal site, so there will be no impacts to Sydney Water sewer infrastructure during construction.

To service the proposal, a new sewer pump station (located on the proposal site) is necessary to convey flows from the site to the existing Sydney Water sewer pipe at the intersection of Clay Place and Russell Road. The exact route of the new sewer main from the onsite pump station to this connection point is to be confirmed at detailed design stage. However, the preferred route crosses underneath the M7. To avoid open-cut trenching of the M7, which would cause significant disruption, this crossing will either use existing spare ducts, or a new crossing will be created by thrust boring. The proposed connection to the existing Sydney Water sewer outside of the proposal site is addressed in **Chapter 22 Related development**. These works will be carried out during earlier stages of construction, such that the permanent system can service both the construction and operation phases of the proposal.

20.3.1.4 Telecommunications

The existing Telstra pit and conduits on site will be removed to enable the construction of the proposal. A new separate telecommunication connection would be installed based on the design prepared by NBN.

A Fibre to the Premises (FTTP) connection by NBN will be built during construction and is proposed to supply a hard-wired service connection to the site during construction and operation as a permanent solution. NBN has confirmed that it will be able to coordinate and support the construction of additional infrastructure to connect to the existing NBN network on Wallgrove Road to the south of the site. The works proposed are not likely to impact on any of the existing telecommunication cables located outside the proposal site, currently located under Wallgrove Road or the M7.

20.3.2 Operation impacts

The WSERRC would be operational most of the year, except for planned shutdowns, to complete annual inspections and maintenance tasks. This includes annual inspections of core electrical, water and sewer systems on site.

The operation impacts, such as the demand which the proposal will place on utility networks, and whether there is enough capacity in the existing network, are assessed below.

20.3.2.1 Electrical

The proposal would generate up to 58MW of base load electricity, some of which would be used to power the facility itself with up to 55MW exported to the grid.

During start-up conditions, the EfW facility will need to import electrical load from the grid to enable the start-up process. Although the exact load will be determined during detailed design, this has been conservatively estimated to be 3MW.

To service the facility during operation, the high-voltage electrical cabling will enter the site along the western boundary, connecting to the existing ducts near the UGOH pole. This would be connected to the Endeavour Energy ducts which run under the M7. Doing this would minimise the need for excavations, which would decrease the risk of associated impacts such as dust, and limit disruptions to the M7 and Wallgrove Road.

Different options for connection have been discussed with network operators. Three feasible route options to connect WSERRC to the grid have been presented by Endeavour Energy (see Appendix D of **Technical report P Utilities and Services Assessment**). This comprises two 33kV options and one 132kV option. All options have been deemed to be technically feasible offering a viable connection to the local transmission network. The points of connection for both 33kV and 132kV are west of the proposal boundary, with the 33kV connection being adjacent to Wallgrove Road. The connection from the proposal site boundary to the 33kV or 132kV feeder offsite are related development and are covered in **Chapter 22 Related development**.

20.3.2.2 Water supply

The water demands from the proposal include:

- Potable water for welfare and cleaning facilities (drinking water, showers, facility washdown)
- Fire water for serving hydrants, cannons and sprinklers systems
- Process water to be fed into the boiler.

The water demands for the proposal are summarised in **Table 20.1**.

Table 20.1: Water demands for operation of the proposal

Water use	Average demand (L/s)	Peak demand (L/s)
Potable water	0.3	1.5
Fire water	18.0	113.1
Process water	9.0	

The peak fire water demand constitutes a significant demand on the existing water infrastructure. To reduce this peak demand, fire hydrant and sprinkler tanks will be arranged. During normal operations, only the potable water and process water flows will be taken from the Sydney Water network. Sydney Water confirmed that they could service the potable and process water demands for the proposal.

All process water would be reused within the facility, with the only losses as steam or quenching the incinerator bottom ash (IBA).

No effluent water will be produced in the EfW process. There are separate potable water and fire water mains proposed, however they will connect into the same Sydney Water Main on Wallgrove Road.

Consultation with Sydney Water has confirmed that the potable and process water demand for the proposal can be met and the proposed connection point on Wallgrove Road can to serve the proposal.

The possibility of supplying the facility with recycled water for use in the EfW process was thought of and this was assessed in consultation with Sydney Water. Based on this assessment, the supply of recycled water to the site was not considered feasible due to the lack of existing recycled water infrastructure in the surrounding area. No recycled water is proposed to be used for the EfW facility.

20.3.2.3 Sewer

The wastewater to be discharged to the Sydney Water networks will be generated from the welfare facilities (kitchens and toilets) within the administration building, visitor and education centre and general site uses, from washdowns and cleaning. There will be no process water discharged to sewer, given that it is wholly consumed as steam and used for quenching of fly ash. So, sewer discharge rates from the proposal will be relatively low. **Technical report P Utilities and Service Assessment** calculates the estimated flows based on occupancy rates of 50 staff and 100 daily visitors to be 0.25L/s and a peak flow of 1.5L/s.

Consultation with Sydney Water has confirmed that the proposed connection point on Roussell Road has capacity to take the sewer demand generated by the proposal.

20.3.2.4 Telecommunications

To control and monitor all processes and components during operation a Continuous Emissions Monitoring System (CEMS) is proposed.

The operation of the CEMS requires an extensive telecommunications network. To enable the continuous operation of the EfW facility and to mitigate the impact of external factors, a hard-wired telecommunications connection has been proposed.

A FTTP connection is proposed to supply a hard-wired service connection to the site. Consultation with NBN has confirmed that a FTTP connection is feasible and that the connection will be made from existing NBN network infrastructure on Wallgrove Road (to the south of the proposal) to the proposal site.

20.4 Mitigation

Table 20.2 describes the proposed measures to mitigate the potential impacts on utilities and services during construction and operation of the proposal.

Table 20.2: Utilities and services mitigation measures

ID	Impact	Mitigation measure
Design embedded mitigation measures		
US1	Power consumption	The proposal avoids additional demand on the capacity of the electricity supply network by generating electricity and exporting it to the grid.
US2	Warragamba Pipelines – vibration damage	In line with the Guidelines for Development Adjacent to the Upper Canal and Warragamba Pipelines, the proposal site layout has been configured, such that the waste bunker (the deepest excavation of the proposal) is located over 150m away from Pipeline Corridor, minimising the risk of vibration impacts on the pipelines.
Construction mitigation measures		
US3	Demand on network	Generators may be used during construction to supplement the power offtake and commissioning activities.
US4	Disruption to network	The timing for any connections/disconnections to existing services will be scheduled to avoid any peak periods and determined in consultation with the utility suppliers to avoid impacts to the existing live networks. Community engagement will be conducted as appropriate to keep the community informed of works and potential service/supply disruptions which may affect them.
US5	Excavation	Spare conduits that cross under the M7 will be used where possible to minimise excavations and mitigate disruptions.
US6		The works for private connections within the proposal site will coincide with bulk earthworks, thus reducing the amount of excavation and trenching needed. Spare conduits will be used for electrical and telecommunication networks which would allow laying new cables without additional earthworks.

ID	Impact	Mitigation measure
US7	Warragamba Pipelines – spills	Any impacts from accidental spills or discharge of chemicals or hydrocarbons, such as fuels and oils in vehicles and/or equipment, will be managed by a spill management plan.
US8	Warragamba Pipelines – sediment runoff	Erosion of soil and sedimentation through stormwater runoff and as result of earthworks and potential vegetation removal will be managed through erosion and sediment control measures to avoid any potential impact to the Warragamba Pipelines.
US9	Warragamba Pipelines – corrosion and earth potential rise	The generation of electricity by the EfW facility has the potential to cause corrosion of the pipelines by low frequency induction. The proposed HV cables will be buried underground, in line with Service and Installation Rules of NSW and Endeavour Energy requirements. The cable routes will be positioned at a minimum of 20m from the pipeline corridor to reduce potential corrosion of the Warragamba Pipelines.
US10	Warragamba Pipelines – vibration damage	Low vibration generating items of excavation plant and equipment will be placed on the southern part of the site. To minimise risks posed by vibration, driven piles will be prohibited, with bored or augured piles used instead. Attended vibration monitoring will be conducted at the beginning of any vibration generating activities to confirm minimum working distances and to limit vibration transmission through the ground. Additional agreed mitigation measures during construction will include setting up a monitoring regime of the pipe protection during the construction of the proposed works and managing traffic flows over the access road, so that WaterNSW retains access to the pipeline corridor and allow activities that maintain the function of this critical asset.
US11	Demolition impacts	Demolition work is to be carried out in line with Australian Standard AS 2601-2001 The Demolition of Structures to avoid impacts on existing infrastructure.
US12	Underground services	A Dial Before You Dig (DBYD) 1100 service in line with the requirements of the *Electricity Supply Act 1995* (NSW) will be carried out before starting underground activity.
Operation mitigation measures		
US13	Demand on water network	Fire and water tanks are proposed to lower the peak water demand on Sydney Water's potable water network.
US14	Warragamba Pipelines – vibration damage	Several vibration generating items will be installed on site such as the turbine and the ACC. The turbine hall is located over 100m and the ACC 60m from the southern boundary of the proposal site. Items that generate vibration have been located about 50m away from the pipeline corridor. The turbine, which creates the most vibration, is located about 100m from the pipeline corridor and will be founded on a piled raft which will incorporate a spring damper system to reduce the vibration effect of the equipment.
US15	Warragamba Pipelines – explosion risk	Most hazardous materials are being stored within the EfW building and are clear of the pipeline corridor. The materials stored are well understood and specific guidance is available for the appropriate protection of these chemicals from sources such as Australian Standards. Items stored externally will be bunded and secured in line with Australian Standards, to mitigate any potential risks to the Warragamba Pipelines.

Chapter 21

Biodiversity

21 Biodiversity

21.1 Introduction

This chapter summarises the potential impacts on biodiversity from the construction and operation of the proposal. A Biodiversity Development Assessment Report (BDAR) has been prepared and is included as **Technical report Q**.

The methodology for the BDAR included:

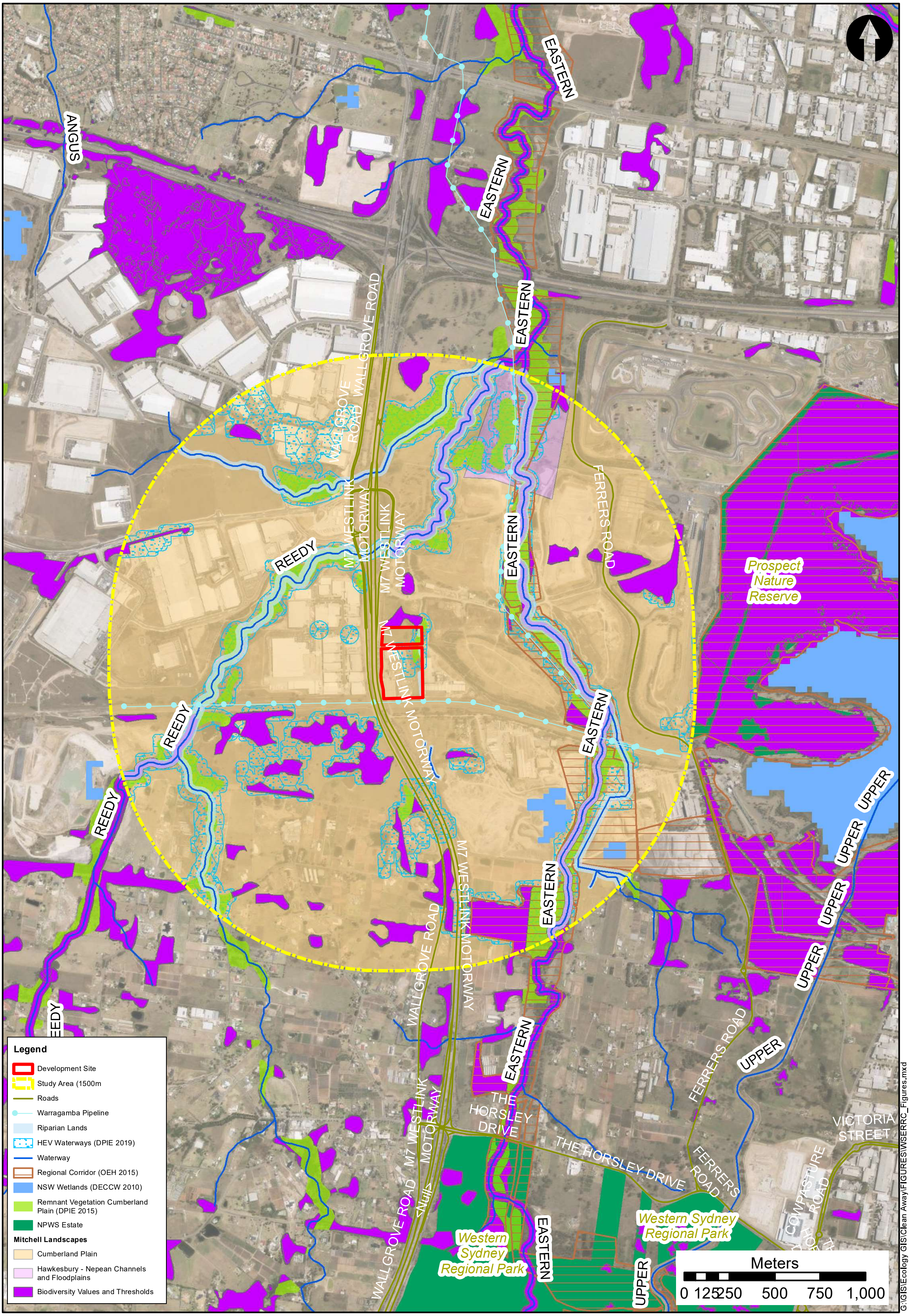
- Creating the study area to be used for the BDAR which included a 1500m buffer surrounding the proposal site
- Gaining a clear understanding of the existing environment and biodiversity values through a desktop review of publicly available spatial datasets and documents and site assessments, to confirm habitat suitability for potentially occurring threatened species and ecological communities
- Conducting onsite surveys of native vegetation, threatened ecological communities, habitats for flora and fauna and targeted surveys of potential threatened/migratory fauna and threatened flora species
- Assessing the impacts of the proposal on existing biodiversity values
- Development of measures to avoid, mitigate or offset biodiversity impacts.

The BDAR was prepared following the NSW Biodiversity Assessment Method (BAM).[1]

21.2 Existing environment

The existing environment was derived from onsite targeted surveys and publicly available spatial datasets. Biodiversity features discovered in the study area are summarised below and shown on **Figure 21.1**.

[1] OEH, 2017.



Service Layer Credits:

© Arup 2020

Figure 21.1: Biodiversity features in the surrounding environment

21.2.1 Bioregion and underlying geology

Australia is categorised into bioregions depending on landscape types. The study area is located within the Sydney Basin Interim Biogeographic Regionalisation for Australia (IBRA) bioregion and the Cumberland IBRA subregion[2]. The geology of the study area is underlain by Cumberland Plain and Hawkesbury–Nepean Channels and Floodplains soil types.

21.2.2 Waterways

The study area is located within the Hawkesbury–Nepean River catchment, which covers about 21,400km². This catchment includes the coastal areas from Turmetta Headland to Barrenjoey near its mouth, and catchments for the Warragamba, the Upper Nepean and the Mangrove Creek dams that are the main water supply reservoirs for the Sydney Metropolitan Area, including Gosford and Wyong.

Although no watercourses are mapped for the proposal site, an overland flow path exists within low-lying areas adjacent to the eastern property boundary. This overland flow path is referred to as a stream in the BDAR. The BDAR classifies this stream as an unmapped first-order stream according to Strahler stream classification[3]. The Hydrology and Flooding Assessment (**Technical report H**) does not classify this stream as a defined watercourse in line with the NSW Office of Water Guidelines for Riparian Corridors on Waterfront Land 2012. For the remainder of this chapter, the stream will be referred to as an overland flow path.

The site drains to Eastern Creek, which is about 500m to the east, which drains north to Hawkesbury River. Reedy Creek is located to the west and joins Eastern Creek about 1.5km north of the proposal site. Both waterways are mapped as key fish habitats[4].

According to the DPIE, the study area supports High Ecological Value (HEV) waterways and water-dependent ecosystems. These are mapped for Reedy Creek, Eastern Creek and the existing farm dam and adjacent vegetation within the proposal site.

[2] Commonwealth Department of Agriculture, Water and Environment.
[3] DoI, 2018.
[4] DPI Fisheries, 2007.

21.2.3 Wetlands

No Ramsar wetlands or Nationally Important Wetlands have been mapped within the study area. A review of the NSW Wetlands spatial layer indicates two wetlands are located south-east of the proposal, within the Austral Bricks property boundary. Aerial imagery indicates an unmapped wetland is also located within the Austral Bricks site, about 160m south of the proposal site. Following heavy rainfall, this wetland is likely to drain to the north, across the Warragamba Pipeline Corridor and through eastern parts of the proposal site.

21.2.4 Biodiversity corridors

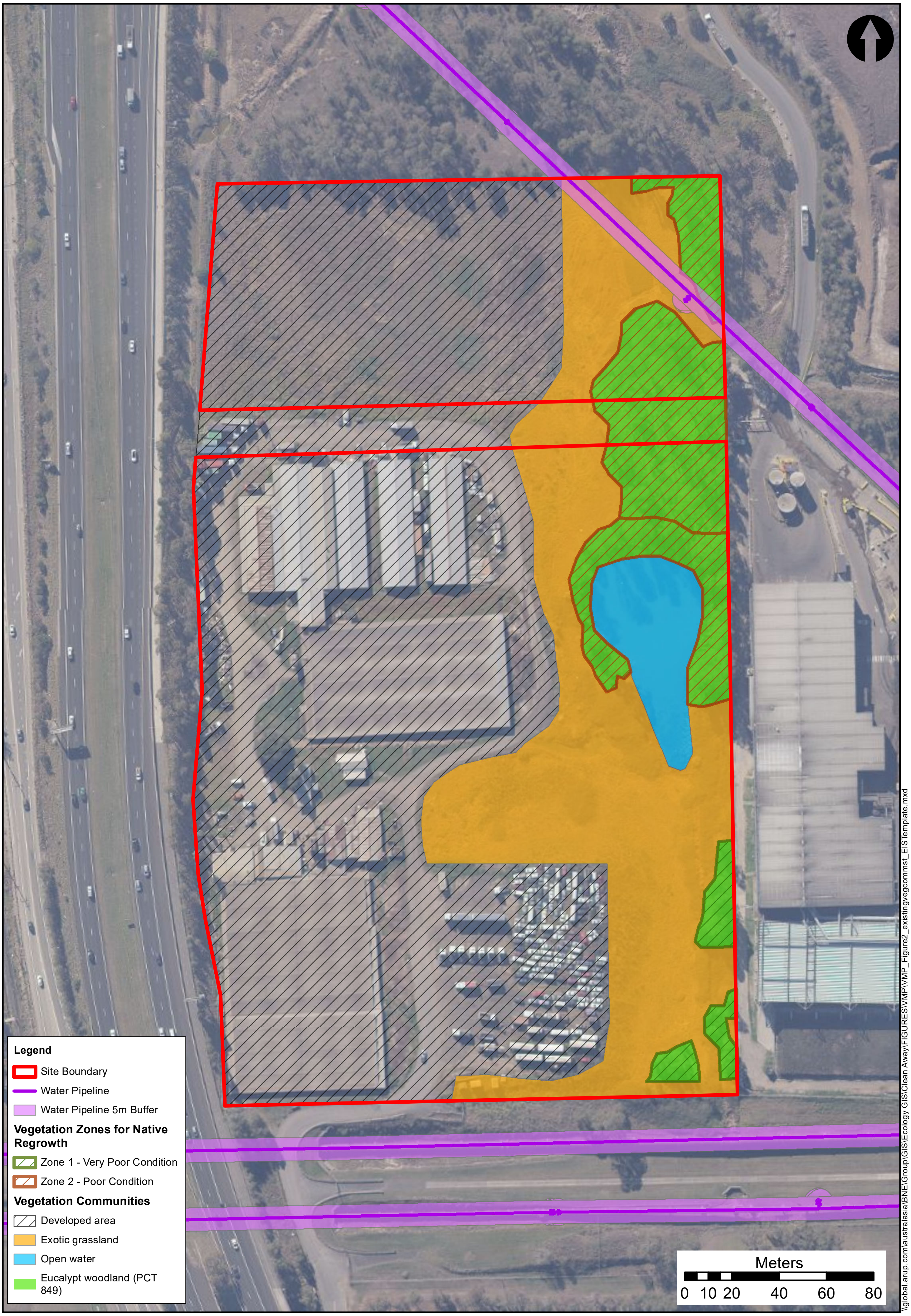
Biodiversity corridors are landscape connections between larger areas of fauna habitat. BIO Map regional biodiversity corridor mapping[5], shows that riparian vegetation associated with Eastern Creek forms a regionally significant biodiversity corridor connecting Prospect Reservoir (about 1.5km to the east) with Western Sydney Parklands. Existing vegetation associated with Reedy Creek also offers some north-south connectivity with Eastern Creek and provides a connection between Eastern Creek and Ropes creek to the west.

Smaller areas of vegetation and scattered trees are located within the proposal site and southern parts of the study area, offering connectivity between adjacent waterways and larger vegetated areas to the north and south.

21.2.5 Native vegetation

A combination of site surveys and online spatial datasets was used to determine the spatial location of vegetation on the proposal site. There are two areas of vegetation as shown on **Figure 21.2** below.

[5] OEH, 2015.



Service Layer Credits:

Figure 21.2: Mapped vegetation on the proposal site

21.2.6 Plant community types

Plant community types are a vegetation mapping classification tool used for planning and assessment in New South Wales. The proposal site supports about 0.88ha of native vegetation comprising one Plant Community Type (PCT) with varying levels of disturbance and condition. Native vegetation within the proposal site generally comprises isolated patches of regrowth Cumberland Shale Plains Woodland (PCT 849) within low-lying areas along the eastern property boundary (as shown on **Figure 21.2**).

Vegetation within the site is subject to high levels of disturbance due to historical land clearing, agricultural land uses and ongoing industrial and transport activities.

21.2.7 Threatened ecological communities

Threatened ecological communities are ecological communities listed within Australian environmental law which are under threat and are given a status ranging from critically endangered to vulnerable. The Cumberland Shale Plains Woodland found on the proposal site is consistent with the NSW *Biodiversity Conservation Act 2016* (BC Act) listed Cumberland Plains Woodland critically endangered ecological community. The vegetation within the proposal site does not meet the EPBC Act requirements as a listed TEC due to the poor condition of the vegetation and the small area of the woodland. A detailed assessment of the key thresholds for determining whether the vegetation meets the EPBC Act requirements is covered in Section 3.3 of the BDAR.

21.2.8 Groundwater dependent ecosystems

The proposal site does not support vegetation reliant on groundwater. During site surveys, only exotic grassland was found. While there are some groundwater-dependent ecosystems (GDEs) mapped for the proposal site, site surveys confirmed that these features comprised exotic grasslands only and were not GDEs.

21.2.9 Threatened species

Flora

There were no threatened flora species found during site surveys. Areas of native vegetation at the site are highly degraded and dominated by exotic species. Habitat quality for the threatened flora species was generally poor.

Fauna habitats

Native vegetation within the proposal site consists of small patches of regenerating eucalypt woodland (about 0.88ha) which is subject to high levels of weed, noise and light disturbance due to historical and ongoing adjacent land uses. The eucalypt woodland would likely serve as habitat for magpie, little raven, lorikeet and noisy miner species. Dense thickets of blackberry and African boxthorn underneath the eucalypt woodland may also serve as habitat for small birds such as red-browed finch and superb fairy wren.

Waterbirds including Australian white ibis, cattle egret and dusky moorhen may use riparian environments associated with the farm dam. Bulrushes and sedges within the overland flow path and at the periphery of the farm dam may also offer potential habitat for green and golden bell frogs.

Exotic grasslands and other developed areas of the site offer little value for native fauna. The vegetation on site offers limited connectivity to larger intact areas of habitat in the wider region.

Targeted survey results

Surveys for terrestrial threatened fauna were conducted between 17 and 23 February 2020. Full details of these surveys are available in Section 4 and 5 of the BDAR.

The surveys included the following methods for targeting candidate species:

- Ultrasonic call detection for micro bat species
- Habitat assessment for:
  - Grey-headed flying fox (presence of camps)
  - Masked owl (tree hollows suitable for breeding)
  - Micro bats (tree hollows suitable for roosting, caves housing breeding colonies, man-made habitat features including buildings, drainage structures and bridges)
  - Little eagle and square-tailed kite (stick nests)
- Observation of disused structures during bat fly-out
- Spotlighting for nocturnal arboreal fauna
- Active searches and call playback for Green and Golden Bell Frog.

Six threatened fauna species were recorded during the field surveys, of which five are listed under the BC Act and two are listed under the EPBC Act as shown in **Table 21.1** below.

Table 21.1: Threatened fauna species recorded during field surveys

Common name	Scientific name	Status	
		BC Act	EPBC Act
White-throated needletail	*Hirundapus caudacutus*	-	V[6]
Eastern coastal free-tailed bat	*Micronomus norfolkensis*	V	-
Large bent-winged bat	*Miniopterus orianae oceanensis*	V	-
Southern myotis	*Myotis macropus*	V	-
Grey-headed flying fox	*Pteropus poliocephalus*	V	V
Greater broad-nosed bat	*Scoteanax rueppellii*	V	-

The results from the targeted microbat surveys showed that the site has limited roosting opportunities for microbats. No microbat calls were recorded near the existing southern poultry shed, suggesting buildings on site are not being used as roosting sites.

The overall number of microbat calls recorded was relatively low for the length of the sampling period (only 394 calls over 18 survey nights). However, it is possible that microbat activity, is higher for the study area than the survey data indicated due to existing background noise inhibiting data collection.

A lack of leaf litter and woody debris was noted within the site during the survey indicating habitat is marginal for Cumberland Plain land snail and Dural land snail. No green or golden bell frogs were recorded during site surveys. Marginal habitat for the green and golden bell frog was observed within bulrushes and sedges associated with the overland flow path and at the periphery of the farm dam. However, these were very sparse and did not offer a large extent of potential habitat. Connectivity to larger areas of potential habitat upstream and downstream of the site is also limited indicating the site is unlikely to offer vital habitat for these species.

Aquatic habitats and threatened species

A survey of the existing aquatic features on site was conducted on 19 February 2020. The details of the methods used for this assessment are available in Section 5 of the BDAR.

A farm dam and an overland flow path are located within the eastern part of the site. The farm dam and overland flow path are not connected, but it is likely that in large storm events there is mixing between the farm dam and the overland flow path.

[6] V: Vulnerable

The overland flow path discharges to Reedy Creek 600m to the north of the site. The overland flow path is characterised by a discontinuous channel with some areas inundated by exotic vegetation (for example, blackberry thickets) or supporting overland flow only.

The overland flow path and the farm dam are manmade, supporting generally stable banks, with few areas susceptible to erosion and the beds are primarily silt. Some native macrophytes (aquatic plants) were present at the margins of the farm dam, serving as amphibian habitat.

A discontinuous and degraded riparian zone was observed dominated by exotic shrubs, grasses and forbs and supporting some scattered native canopy trees. The width of the riparian corridor generally varied from 0m to 10m, with some areas north of the dam being about 35m wide.

No mapped habitat for threatened fish was found within or adjacent to the site. However, turtles and elvers were observed during the targeted surveys for candidate threatened fauna species. These species are commonly associated with disturbed freshwater environments and are not listed as threatened.

Observed aquatic habitats do not meet the definition of Key Fish Habitat, as defined by the policy and guidelines for fish habitat conservation and management[7].

21.2.10 Matters of National Environmental Significance

The EPBC Act lists Matters of National Environmental Significance (MNES) including biodiversity species, which are protected by federal law. Two threatened fauna species and one marine fauna species listed under the EPBC Act were recorded on the proposal site during field surveys, these were the grey-headed flying fox, white-throated needletail and cattle egret.

As stated in **Section 21.2.7**, Cumberland Plains Woodland does not meet the EPBC Act requirements (see also Section 3.3 of BDAR).

Section 6 of the BDAR concludes that due to the lack of habitat present within the study area, any proposal impacts to EPBC Act listed species are negligible and do not meet any significant impact criteria, as defined by the Commonwealth Significant Impact Guidelines (DoE, 2013) (refer to Appendix F of the BDAR). As such, works associated with the development do not require Commonwealth referral.

[7] DPI, 2013.

21.3 Assessment

Biodiversity impacts are described using four impact categories:

- Direct – an impact as a direct result of action (for example, vegetation loss from clearing)
- Indirect – an impact as a result of an indirect action (noise, light, litter, dust, air quality impacts)
- Prescribed – an impact that may affect biodiversity values in addition to, or instead of, impacts from clearing vegetation
- Aquatic – impacts on aquatic environments and aquatic species.

The assessment of both construction and operation impacts from the proposal are assessed for each impact category.

Table 21.2 summarises the types of impacts and whether they will occur during construction or operation of the proposal.

Table 21.2: Biodiversity impacts

Biodiversity value	Potential impact	Proposal phase	
		Construction	Operation
Direct impacts			
Native vegetation	Loss of 0.45ha of Cumberland Shale Plains Woodland (PCT849)	✓	
Threatened ecological communities	Loss of 0.45ha of BC Act listed Cumberland Plain Woodland	✓	
Threatened species	Loss of 0.45ha of habitat for southern myotis	✓	
Indirect impacts			
Native vegetation, threatened ecological communities and habitat for threatened species	Disturbance from noise, light and litter	✓	✓
	Edge effects and impacts to habitat viability	✓	✓
	Dust and other air quality impacts	✓	✓
	Disturbance from weeds, pests and pathogens	✓	
Prescribed impacts			
Native vegetation, threatened ecological communities and habitat for threatened species	Loss of habitat connectivity	✓	
	Impacts to hydrology and water quality	✓	
	Impacts to groundwater	✓	
	Fauna injury/mortality due to vehicle strike	✓	✓

Biodiversity value	Potential impact	Proposal phase	
		Construction	Operation
Other impacts			
Aquatic habitats	Impacts to the downstream receiving environment habitat and water quality	✓	
	Impacts to hydrology	✓	
	Displacement of aquatic fauna (native and exotic)	✓	
	Impacts to water quality	✓	✓

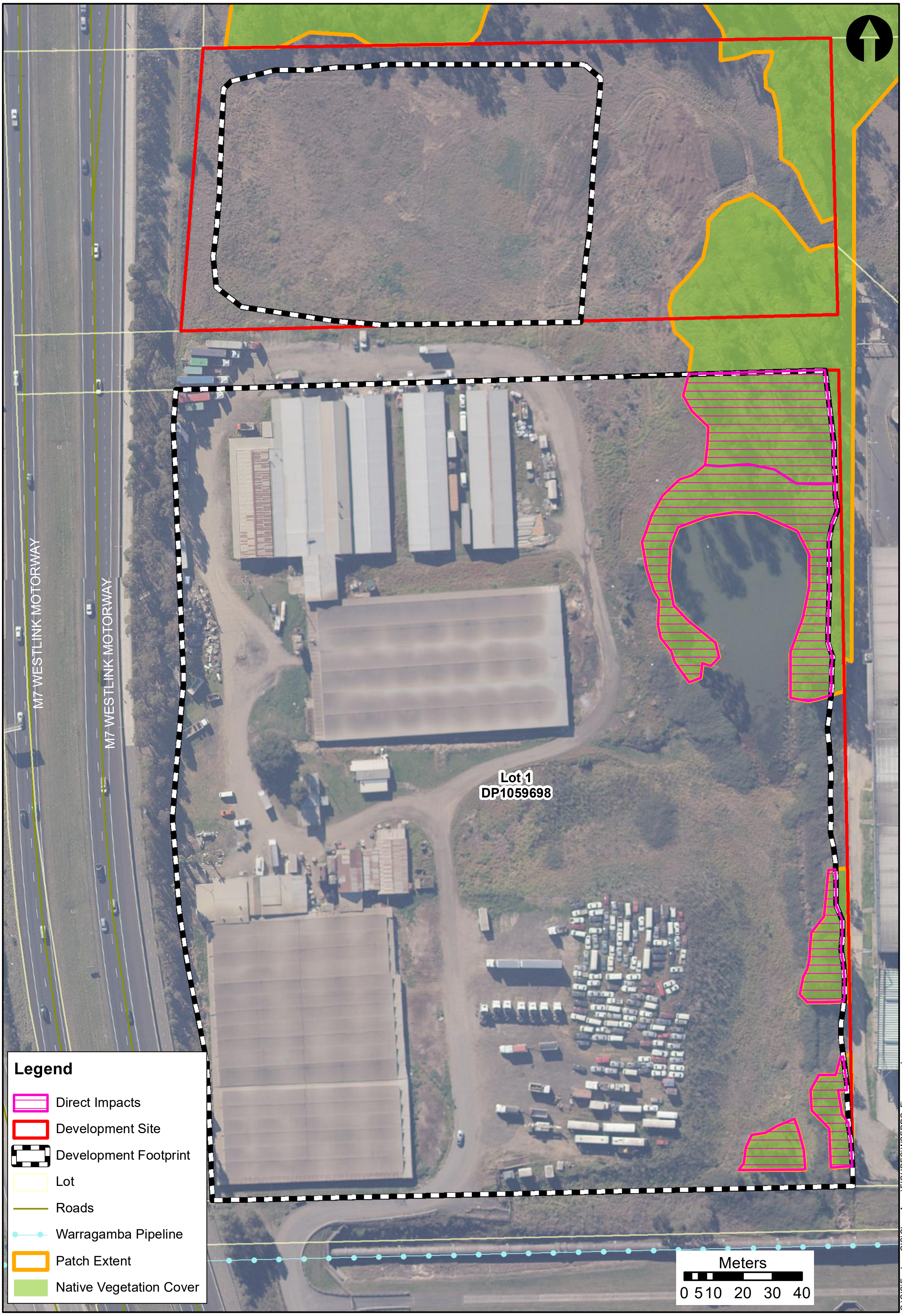
21.3.1 Direct impacts

Direct impacts associated with the proposal are mainly related to the proposed site clearing works. An area of 0.45ha of native vegetation will be cleared during construction of the proposed EfW facility and associated infrastructure. **Table 21.3** covers the extent of impacts including predicted change in vegetation integrity for vegetation communities within the development footprint.

Table 21.3: Impacts to native vegetation

PCT	Condition	Proposed clearing extent (ha)	Current vegetation integrity score	Future vegetation integrity score	Regional extent	
					Estimate extent remaining[8]	Estimate % cleared[9]
PCT 849 Cumberland Shale Plains Woodland	Very Poor	0.09	20.6	0	6800ha	93%
PCT 849 Cumberland Shale Plains Woodland	Poor	0.36	31	0	6800ha	93%

[8] Estimate of pre-European extent remaining modelled from known site or polygon data.
[9] Percent of pre-European extent cleared.



Service Layer Credits:

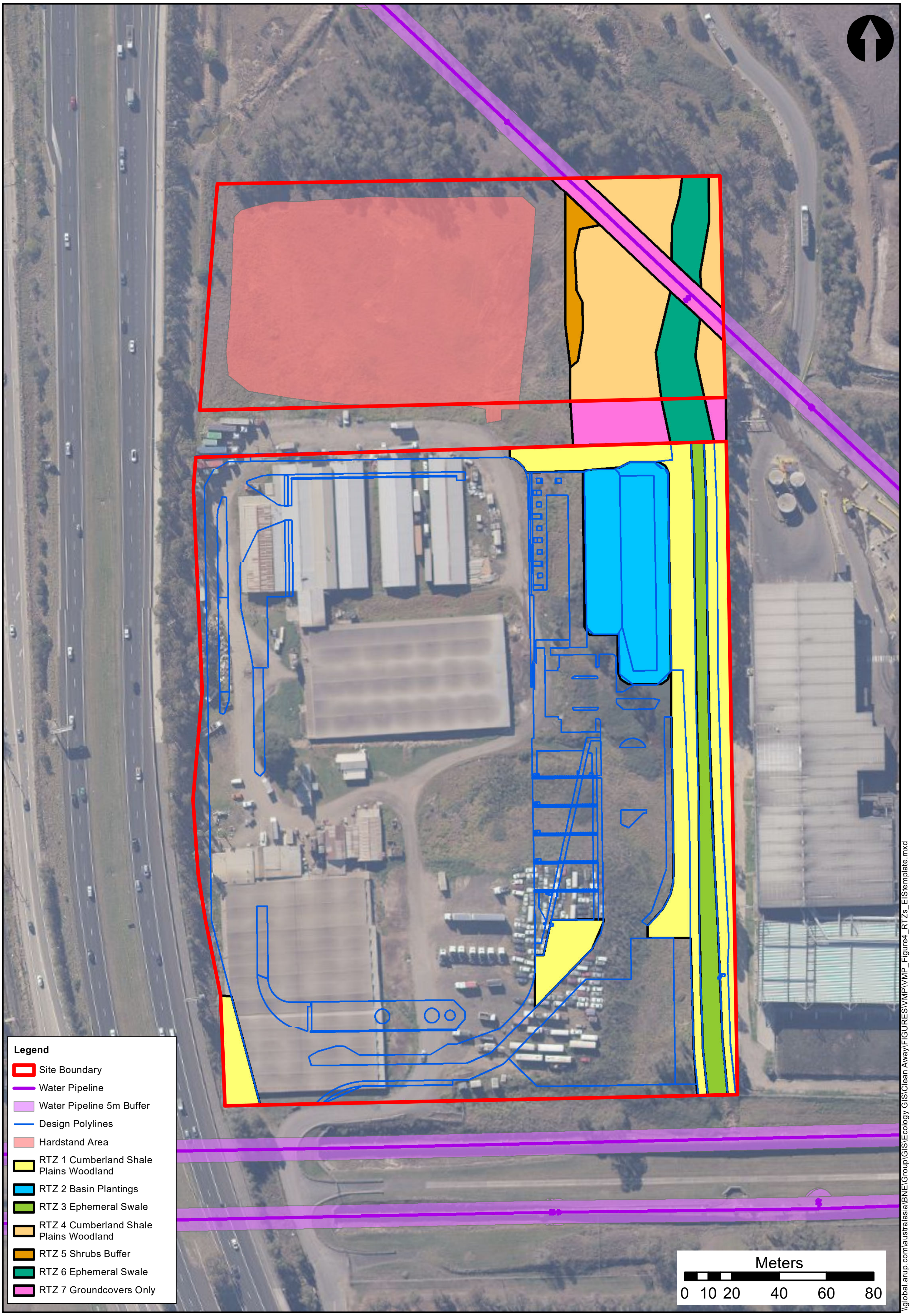
Figure 21.3: Proposal impacts to biodiversity values

The proposal will result in a loss of 0.45ha of Cumberland Plain Woodland, listed as critically endangered under the BC Act. This will result in 0.45ha loss of Eucalypt woodland offering foraging and marginal roosting opportunities for southern myotis, listed as vulnerable under the BC Act. Foraging habitats for other fauna species will also be lost. No threatened flora species will be impacted as a result of the proposal.

Site landscaping and restoration of cleared native vegetation communities, ecological communities and impacted aquatic habitats is proposed following construction of the facility to minimise impacts to biodiversity. Details of the proposed restoration are shown in **Table 21.4** and **Figure 21.4**, and in the Vegetation Management Plan included as Appendix G to the BDAR.

Table 21.4 Proposed restoration

RTZ	Treatment	Target community	Approximate area (ha)
1	Reconstruction	Species generally representative of PCT849 Cumberland Shale Plains Woodland	0.65
2	Reconstruction	Native grasses and riparian plants appropriate for predicted water levels at the edges of the bioretention basin and OSD basin	0.31
3	Reconstruction	Ephemeral swale	0.18
4	Rehabilitation	Species generally representative of PCT849 Cumberland Shale Plains Woodland	0.37
5	Rehabilitation	Shrubs buffer	0.04
6	Rehabilitation	Ephemeral swale	0.16
7		Groundcovers (grasses and sedges) around the Sydney Water pipeline and in right of carriageway	0.18
Total			**1.89ha**



Service Layer Credits:

© Arup 2020

Figure 21.4: Proposed vegetation restoration

21.3.2 Indirect impacts

Indirect impacts from the proposal would include noise, light and litter impacts, impacts to habitat viability, dust and air quality impacts and impacts from weeds, pests and pathogens. These impacts are generally considered to be negligible with the application of suitable design measures and construction controls.

21.3.2.1 Disturbance of remaining habitats due to increased noise, light and litter

Habitats within and near to the proposal site are already subject to considerable disturbance as a result of adjacent industrial and transport land uses. This includes noise and light pollution from the adjacent lands to the east and the M7 Motorway to the west. Despite this, habitats within the accessway and northern portion of the site adjacent to the proposal footprint are likely to be subject to some increased disturbance.

Operation of the facility will be 24 hours and will involve the use of machinery and equipment likely to generate noise. Trucks will also be delivering waste to the site during daylight hours. Based on the results of the noise assessment, operational noise impacts will be generally low, not exceeding 74dB as a worst-case scenario at the eastern site perimeter.

Noise impacts associated with construction are likely to be higher than during operation, with construction involving the use of loud activities, such as piling and rock hammering. This will be limited to daytime hours for the duration of the construction period.

Operation of the facility is likely to result in some increased light pollution for habitats immediately adjacent to the development footprint. However, this will be minimised wherever possible using sensor lighting and/or directional lighting for more heavily used parts of the facility. Construction activities will be carried out during daylight hours and are unlikely to need additional lighting.

Litter is currently being deposited within the proposal site from surface water runoff from the facility to the east. These waste materials pose a risk to water quality and the health of common terrestrial and aquatic fauna likely to use habitats within the site. Construction of the facility and ongoing site operations could increase litter as described in **Chapter 10 Waste management**.

21.3.2.2 Edge effects and impacts to habitat viability

Flora and fauna habitats immediately adjacent to the proposal site could be impacted by the proposal. However, these impacts are considered negligible given the existing high levels of disturbance due to historical clearing and weed invasion within areas supporting native vegetation.

Restoration activities proposed following construction of the facility would improve the viability and ecological function of remaining habitats through weed management and improvements to vegetation communities.

21.3.2.3 Dust and other air quality impacts

During construction, dust and airborne particulates could temporarily impact vegetation and remaining habitats adjacent to the development footprint. However, these impacts will be managed through erosion and sediment control measures during construction.

Existing levels of dust and other particulates (such as $PM_{2.5}$ and PM_{10}) within the site were determined to already exceed recommended criteria, and an increase of less than 1% is predicted as a result of proposed operations.

Modelled emission levels during operation will not exceed guideline limits, and proposed mitigation measures for human health concerns are appropriate to address any risks to retained vegetation communities and habitats within and adjacent to the development footprint.

21.3.2.4 Disturbance from weeds, pests and pathogens

There is the potential for the introduction and spread of weeds and pathogens during construction as a result of machinery movements, increased foot traffic and landscaping activities.

There are at least seven high threat weed species confirmed for the site. These weeds would be initially controlled and then managed during construction, to prevent further spread.

Pathogens, including root rot, myrtle rust and chytrid fungus, have the potential to be introduced to the site during construction, which could impact terrestrial and aquatic habitats.

However, the potential risks associated with pathogen introduction are considered relatively low-risk and will be managed through construction hygiene protocols. The ongoing operation of the facility will pose little risk to biodiversity from pathogens as operations will be contained within developed areas of the site. Permanent fencing, buffer plantings and batters would be used to delineate the extent of developed area from other vegetated parts of the site.

Habitats within the proposal site are already likely to be subject to disturbance from pest species including fox and feral cat. Development activities are unlikely to result in any increased risk of predation or pests within retained habitats.

21.3.3 Prescribed impacts

Prescribed impacts are listed in section 6.1 of the *Biodiversity Conservation Regulation 2017* (BC Regulation). Potential prescribed impacts associated with the development are discussed below include:

- Impacts on the connectivity of different areas of habitat of threatened species that supports the movement of those species across their range
- Impacts on water quality, water bodies and hydrological processes that sustain threatened species and threatened ecological communities
- Impacts of vehicle strikes on threatened species of animals or on animals that are part of a threatened ecological community.

21.3.3.1 Loss of habitat connectivity and impacts to flight paths

Existing vegetation and habitats within the proposal site are already subject to high levels of fragmentation due to historical clearing and land uses. However, there are scattered vegetation and trees within the site which do give some connectivity between adjacent waterways and other vegetated areas.

These connectivity pathways have the potential to be used by southern myotis and other threatened bat species. There is potential for the proposal to impact habitat connectivity in this respect. An assessment of impacts on habitat connectivity was carried out (see Section 7.2.3 of the BDAR). The results of the assessment indicate habitat connectivity will be enhanced through the increase of native vegetation cover along the eastern property boundary. Proposed restoration treatments are likely to improve the structure of target vegetation communities and will support increased habitat function and movement opportunities for fauna.

The proposed height of the stack structure will be about 75m above ground level, with an associated plume. This could affect the flight paths for birds and bats. However, no observed or predicted flight paths for threatened birds or bats were found within the proposal site.

Habitat within and adjacent to the site is generally marginal for these species and any potential fauna movements are likely to involve north-south movement between habitat fragments along vegetation within the eastern part of the site (not the location of the stack).

21.3.3.2 Impacts to hydrology and water quality

Construction and operation of the proposal could cause changes in water quality and impacts to native vegetation, habitats and ecological communities.

Construction activities could result in the movement of soils and suspended solids, leading to increased turbidity. These impacts would be managed through the application of construction controls outlined in **Section 21.4**.

The existing overland flow path is proposed to be realigned and restored with additional planting. This will occur after construction and be carried out as a staged approach to enable the successful uptake of plantings. Details are available in the Vegetation Management Plan (VMP) included as Appendix G to the BDAR. This realignment and replanting of the overland flow path will have positive impacts for water quality and flooding.

21.3.3.3 Impacts to groundwater

Site-based soil and water investigations and conceptual modelling indicate a shallow/perched groundwater layer may be intercepted during construction of the waste bunker. The extremely low permeability of the underlying geology means that the potential for significant drawdown is likely to be low and intermittent (see **Technical report F Soils and Water Assessment Report**). The soils and water assessment in **Chapter 11 Soils and water** and **Technical report F** conclude that the proposal will not result in a significant increase in hardstand and so will not interfere with groundwater recharge. The proposed waste bunker it is not expected to interfere or intercept groundwater flows within the deeper regional groundwater table.

Overall, construction activities and groundwater impacts are considered to pose a low risk to ecological communities and associated habitats.

21.3.3.4 Fauna injury/mortality due to vehicle strike

The proposal will increase the risk of fauna injury or death as a result of collision with vehicles and/or machinery during the construction and operation of the facility. Permanent fencing will be installed at the interface between natural habitats and operational areas of the site and will help in minimising any risk of fauna injury or death. Similarly, temporary fencing will be installed during construction to minimise the risk of vehicle strike as well as entrapment in deep excavations.

21.3.3.5 Summary of prescribed impacts

Overall, with appropriate mitigation measures, these prescribed impacts have a negligible impact on biodiversity values within and adjacent to the proposal site.

21.3.4 Aquatic impacts

There will be some impacts to aquatic habitats and fauna from the realignment of the overland flow path and the removal of the farm dam. Although there are no listed aquatic species on site, there is still potential for fauna to be displaced, and habitat to be lost.

The proposal includes a realignment of the overland flow path and two bioretention basins, which are designed to meet the relevant stormwater design guideline requirements and where possible apply principles of Water Sensitive Urban Design as described by Blacktown City Council. The proposed realignment of the overland flow path will cause temporary loss of aquatic habitats and displacement of aquatic fauna. However, a riparian corridor will be re-established after construction, incorporating improvements to stream connectivity and the restoration of riparian vegetation and aquatic habitats. The width of the restored riparian corridor will be about 9–11m, increasing to 76m wide in some locations. Connectivity will be restored from the southern boundary of the property through to the northern property boundary, with proposed restoration works (including weed management and restoration of riparian vegetation).

The removal of the farm dam will result in habitat removal for aquatic and other species that rely on the access to water. The use of water for dust control or during dewatering process could also mobilise sediments into the receiving environment. Baseline soil samples showed elevated levels of ammonia, copper, zinc and polycyclic aromatic hydrocarbons and disturbing these sediments could cause impacts to species habitat. A Dewatering Management Plan would be carried out so that these impacts are avoided.

The farm dam contains aquatic fauna both of native and exotic species. The native species should be relocated to a suitable habitat and the exotic species should be removed from the system to avoid the release of exotic species, such as the mosquitofish, into the receiving environment.

21.3.5 Serious and irreversible impacts

An impact is to be regarded as serious and irreversible if it is likely to contribute significantly to the risk of a threatened species or ecological community becoming extinct. Principles for determining potential serious and irreversible impacts (SAII) are specified in clause 6.7 of the BC Regulation 2017.

The impacts to the Cumberland Plain Woodland are potentially SAII. However, no SAII thresholds have currently been set for the Cumberland Plain Woodland. The Cumberland Plain Recovery Plan (DECCW, 2011) and the NSW Scientific Committee final determination for the ecological community have been used to assess proposal impacts against each of the SAII principles (see **Table 28** of **Technical Report Q**). The results of the assessment indicate that the impacts of the proposal to the TEC are unlikely to constitute a SAII.

Southern myotis is not a potential SAII entity and impacts to the species as a result of the proposal are unlikely to contribute to any increased risk of extinction.

21.3.6 Offsetting

Section 8.1 of the BDAR outlines the tests for determining whether biodiversity offsets are needed. In summary, while 0.45ha of Cumberland Woodland will be cleared, the clearing impacts will not exceed the area-based threshold of 0.5ha relevant to the minimum lot size for the site as set by section 7.1 of the BC Act, nor will any biodiversity listed on the biodiversity values map (BVP) be impacted.

Under section 7.3 of the BC Act, offsets may also be necessary for a development where it is likely to have a significant effect on threatened species or ecological communities, or their habitats. The BDAR concludes that the proposal is not likely to result in any significant impacts to these matters.

As such, the proposal does not trigger any offset requirements under the NSW Biodiversity Offset Scheme.

21.4 Mitigation

Measures to avoid impacts on biodiversity values were considered during a detailed site selection process and during design of the proposal as outlined in Section 7 of the BDAR. Mitigation measures outlined in other chapters and technical reports of this EIS are also relevant for mitigating biodiversity impacts. These include management plans for construction noise and vibration, air quality, soil and water, erosion and sediment, groundwater, waste and dewatering. Further measures to mitigate and manage impacts to biodiversity are outlined in **Table 21.5.**

Table 21.5: Biodiversity impact mitigation measures

ID	Impact	Mitigation measures
Design embedded mitigation measures		
BD1	Disturbing biodiversity values	The size and layout of the proposal has been consolidated to minimise disturbance of existing biodiversity values.
Construction mitigation measures		
BD2	General construction impacts on flora and fauna	A Flora and Fauna Management Plan would be prepared and carried out. The Flora and Fauna Management Plan would include appropriate controls to manage biodiversity during construction and avoid impacts on biodiversity values.
BD3	Unexpected finds	As part of the CEMP, an unexpected finds procedure would be prepared and applied to describe the process for discovering, dealing with, and managing any unexpected threatened flora or fauna.
BD4	Noise impacts on fauna	Noise activities such as piling, and rock hammering should be limited to daytime hours for the duration of the construction period. These measures will be included in the Construction Noise and Vibration Management Plan.
BD5	Waste/litter	A Waste Management Plan would be prepared as part of the CEMP to manage waste during construction and would include measures to avoid impacts on biodiversity.
BD6	Impacts on aquatic fauna and water quality	A Dewatering Management Plan would be prepared as part of the CEMP outlining strategies for the use of the water within the dam, controls for reducing contamination risk in the form of suspended solids impacting on the receiving environment and completing an aquatic fauna/fish salvage.
BD7	Changes to the aquatic habitats on site and loss of vegetation	A Vegetation Management Plan will be prepared, carried out and audited as a part of the CEMP and will outline proposed measures for the restoration of native vegetation, ecological communities and associated habitats within the development site. The plan will be generally in keeping with the Vegetation Management Plan (Appendix A of the BDAR). Site landscaping and habitat restoration will include restoration of the riparian corridor, 0.6ha of plantings including trees, shrubs and grasses generally representative of a Cumberland Shale Woodland ecological community. The Vegetation Management Plan will include any measures for ongoing management and monitoring of restoration outcomes.
BD8	Vegetation selection	Vegetation proposed as part of the Vegetation Management Plan will consider the location of infrastructure and selection of species to avoid impacts on infrastructure.
BD9	Weeds, pests and pathogens	Management measures would be prepared, applied and audited to avoid and minimise the environmental risks associated with weeds, pests and pathogen. A Weed Management Plan would be incorporated as part of the Vegetation Management Plan.
BD10	Lighting impacts on fauna	Lighting impacts are to be minimised as much as possible using sensor lighting and/or directional lighting for more heavily use parts of the facility.
Operation mitigation measures		
BD11	Pathogens and pests	Operations will be contained within developed areas of the site, with permanent fencing, buffer plantings and batters delineating the extent of these areas from other vegetated parts of the site.

Chapter 22

Related development

22 Related development

22.1 What is related development

This EIS seeks approval for the construction and operation of the WSERRC as described in **Chapter 3 Proposal description**. Several additional developments referred to as related development are needed to support the operation of the WSERRC or may be needed, subject to further investigation. These will be assessed and determined through separate approval processes under Part 4 or Part 5 of the *Environmental Planning & Assessment Act 1979*.

Table 22.1 lists the developments that are related development for the purposes of WSERRC.

The following sections describe the related development and their relationship to WSERRC, including an assessment of their potential impacts based on currently available information. Applications for approval for confirmed related developments will be progressed at the appropriate time.

22.1.1 Relationship between WSERRC and related development

This section identifies each related development and describes its relationship to the WSERRC.

Table 22.1: Relationship between WSERRC and related development

Related development	Relationship to the WSERRC
Processing facility	The resource recovery criteria in the NSW EfW policy Statement requires waste processed at an Energy Recovery Facility (or an EfW facility) to be 'residual from bona-fide resource recovery operations'. The Policy notes that the EPA considers energy recovery to be a complementary waste management option for the residual waste produced from material recovery processes or source-separated collection systems. The Policy sets specific criteria which determine the amount of waste that can be received at an EfW facility from a processing facility. Greater source separation allows a higher proportion of the waste received at a processing facility to be sent to an EfW facility, which is in part dependent on the extent to which Councils transition to greater source separation (for example, councils using a 3-bin FOGO collection) in the future. If processing of waste is needed before it being received by the proposal, this is likely to be located at Cleanaway's existing Erskine Park Waste Transfer Station, which may trigger the need to increase the approved capacity at this facility.

Related development	Relationship to the WSERRC
IBA processing and secondary metals recovery facility	Incinerator Bottom Ash (IBA) is produced as a waste by-product from the EfW combustion process. IBA is an inert by-product which contains ferrous and non-ferrous metals. The WSERRC will include a ferrous metal separator onsite, to recover large ferrous metals from the IBA for recycling and sale to market. The remaining IBA may be transported to a dedicated IBA processing, treatment, metal recovery and maturation facility where non-ferrous metals (or secondary metals) recovery may be carried out. This dedicated offsite IBA processing facility is under investigation for consideration only. Options to reuse the IBA in construction products are being explored by the applicant and would be subject to getting the necessary resource recovery order. The IBA processing facility, if progressed, will be subject to a separate development application process. However, the site location for storage and/or treatment has not been finalised at this stage. Note that other ash by-products, including Flue Gas Treatment residues (FGTr) and boiler fly ash, will be managed offsite using existing infrastructure (described in **Chapter 3 Proposal description**) and will not need any additional related development. It is noted that part of the boiler fly ash stream is captured with the IBA and part of this ash stream is captured with the FGTr and will be transported for disposal according to the ash type it is collected with.
An electrical connection to the high-voltage network	The WSERRC is designed to generate about 58MW of electricity on a gross basis (between 53MW and 55MW of this electricity will be exported to the electricity grid). Some of the electricity generated will be used to power the facility itself (3MW to 5MW). To allow generated energy to be exported to the electricity grid and to allow electricity to be supplied by the electricity grid when the facility is not operating (for example, in facility start-up or shutdown for maintenance) a new connection to the electricity grid is needed. Different options for connection have been discussed with network operators. Three feasible route options to connect the WSERRC to the grid have been identified by Endeavour Energy. This comprises two 33kV options and one 132kV option. All options have been deemed to be technically feasible offering a viable connection to the local transmission network. The points of connection for both 33kV and 132kV are west of the proposal boundary, with the 33kV connection being adjacent to Wallgrove Road. The connection from the proposal site boundary to the 33kV or 132kV feeder will be planned and carried out by the network operator. The final electricity connection point and route will be confirmed in detailed design.

Related development	Relationship to the WSERRC
Water and sewer connections	The proposal will require new connections to water supply and sewer infrastructure. The proposed connection to the existing Sydney Water main would be under Wallgrove Road. The proposed connection to the existing sewer pipe at the intersection of Clay Place and Russell Road would be underneath the Westlink M7 Motorway (the M7). However, the exact route will be confirmed as the design progresses.
Telecommunications connections	The proposal will require a new connection to the telecommunications network. To control and monitor all processes and components in operation, and to support automatic operation of the EfW facility, a Continuous Emissions Monitoring System (CEMS) is needed. The operation of the CEMS requires an extensive communication network. To enable the continuous operation of the EfW facility and to mitigate the impact of external factors, a hard-wired telecommunications connection has been proposed using a Fibre to the Premises (FTTP) NBN connection.
Site access works	Existing access to the site is through a dedicated access road off Austral Bricks Road adjacent to the site's southern boundary. The road crosses over the Warragamba Pipeline Corridor to enter the site from the south. The existing access road was constructed by encasing the two pipelines in construction of the M7. The site access needs to be upgraded to accommodate the traffic movements associated with the proposal. The proposed solution for site access is widening the existing site access on the Eastern side with no additional covering of the pipelines and improving the tie-in to the Austral Bricks Road. The preferred access solution has been agreed in principle with WaterNSW. Ongoing consultation will continue with WaterNSW, to agree on the detailed design and construction method.

The following sections describe each related development that may be needed, provides an assessment of potential environmental impacts, outlines the approval process and provides an indicative timing for construction and operation.

22.2 Processing facility

If a facility is needed to process waste before being sent to WSERRC, it is likely to be an expansion to Cleanaway's Erskine Park Waste Transfer Station.

22.2.1 Description

Cleanaway owns and operates a Waste Transfer Station incorporating basic resource recovery at Erskine Park, located around 6km west from the WSERRC site (**Figure 22.1**). The facility is licenced to receive up to 300,000tpa of waste (MSW and C&I) with valuable materials recovered for resale. The residual waste, currently sent to landfill, is available as a feedstock to be sent to the WSERRC for energy recovery.

The Waste Transfer Station was approved through a Staged SSD application which granted consent for a Concept Proposal for a Waste and Resource Management Facility comprising two stages: a Stage One Waste Transfer Station incorporating resource recovery and a Stage Two resource recovery facility. Consent was also given for the construction and operation of the Stage One facility as part of this approval.

The consent for the Stage One Waste Transfer Station was then modified to include a manual sort line, to expand the scope of resource recovery that could be carried out.

Subject to future changes in the source separation of waste and the availability of resource recovery and recycling infrastructure, the Waste Transfer Station could be expanded to process additional waste, with the residual waste sent as feedstock to WSERRC.

The scale of future expansion of the Erskine Park Waste Transfer Station, if necessary, is dependent on future directions in the waste market, such as source separation and collection arrangements, including councils transitioning to using a 3-bin FOGO collection system and the application of the resource recovery criteria and exemptions to WSSERC.

\\global.arup.com\australasia\SYD\Projects\273000\273862-00 WSERRC\Work\Internal\Design\GIS\Map\Desktop\WSERRC_Figure_22_1_Erskine_Park.mxd

Service Layer Credits: © Department of Customer Service 2020;Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community © Arup 2020

Figure 22.1: Location of Erskine Park Waste Transfer Station and likely route to the WSERRC

22.2.2 Approval process and indicative timing

The original Erskine Park application was assessed as SSD because it meets the definition of SSD under clause 23 of Schedule 1 of the State Environmental Planning Policy (State and Regional Development) 2011 (SRD SEPP):

> *(2) Development for the purpose of waste or resource transfer stations in metropolitan areas of the Sydney region that handle more than 100,000 tonnes per year of waste.*
>
> *(3) Development for the purpose of resource recovery or recycling facilities that handle more than 100,000 tonnes per year of waste.*

The planning approval pathway for an application to expand resource recovery capacity at the Waste Transfer Station, if necessary, would depend on the nature and scale of the expansion needed. However, for the purposes of this assessment, it is assumed to be SSD.

Table 22.2 shows indicative timeframes for planning approval, construction and operation.

Table 22.2: Indicative timeframes for planning approval and construction

WSERRC Related development	Planning pathway	Planning approval timeframe	Construction timeframe	Total time to operation
WSERRC	SSD	18 months	3 1/4 years	5 years
Erskine Park WTS	SSD	12–18 months	1 year	2.5 years

22.2.3 Environmental impacts

As the Erskine Park Waste Transfer Station is located on a previously disturbed and developed site, the key environmental impacts associated with its expansion mainly relate to the intensification of operation impacts, rather than land development.

The site is located in the Erskine Business Park adjacent to Cleanaway's operational Erskine Park Landfill and surrounded by industrial and warehouse development. The nearest residential areas are about 700m away.

One of the key thoughts in designing the facility was to manage potential odour impacts. The facility is fully enclosed with fast-acting roller shutter doors to allow vehicle access and operates under negative pressure to limit fugitive emissions escaping.

Odour is captured through the air handling system, with the potential to be treated through a wet scrubber before being discharged to the atmosphere through a forced ventilation system. The wet scrubber and ventilation system were installed with additional capacity to cater for future expansion.

The facility operates in line with an Environmental Protection Licence (EPL) issued by the EPA, and it is assumed that any future expansion of the facility would operate within the same licence conditions.

The location of the facility in the Erskine Business Park, separated from residential areas, also serves as a main source of impact mitigation.

Considering the facility's current operations, only potential additional impacts have been summarised below.

Table 22.3: Erskine Park potential environmental impacts

Environmental aspect	Assessment of environmental impact	Management of environmental impact
Air quality and odour	*Potential construction impacts* • Increased dust from ground disturbance and construction vehicles. *Potential operation impacts* • Increase in odour from putrescible waste as a result of the increased volumes of waste received and stored at the site • Increased dust because of the increased volume of waste to be processed at the facility • Increased vehicle exhaust emissions generated by the increase in vehicles accessing the site and the movement of more waste material onsite by equipment.	Construction impacts would be managed by including dust mitigation measures in a Dust Management Plan as part of a Construction Environment Management Plan (CEMP). Potential operation impacts will be managed by: • Continuing to execute the air quality strategy approved in the existing EPL. This will involve containment of emissions using fast-acting roller shutter doors and operating the facility under negative pressure, treating emission through a wet scrubber where necessary and dispersing the air to the atmosphere through a forced ventilation system. • The air pollution and odour control system, comprising a wet scrubber and forced ventilation system, has been designed with the potential to add more if needed.

Environmental aspect	Assessment of environmental impact	Management of environmental impact
Noise and vibration	*Potential construction impacts* • Increased noise and vibration impacts resulting from operation of construction equipment. *Potential operation impacts* • Operational noise and vibration impacts resulting from the movement of trucks and operation of plant and equipment.	Construction Noise and Vibration Management Plan (CNVMP) will be prepared and used to mitigate construction impacts. The existing facility is approved to receive waste by means of truck deliveries, recovery and recycle waste through resource recovery activities and transfer recovered materials and waste offsite. Operations are carried out in line with an approved EPL, including noise conditions. An expanded facility is likely to include similar waste receival, recycling and resource recovery and waste transfer activities and would be operated in line with existing EPL conditions, including for noise. The location of the site in an industrial area with good separation distances to the nearest residential areas will help minimise operational noise impacts.
Traffic and transport	*Potential construction impacts* • A temporary increase in traffic movements from construction vehicles in and out of the site. *Potential operation impacts* • An increase in traffic in operation of the facility.	Access to the Erskine Business Park benefits from a few recent road upgrades and planning future road upgrades. Recent upgrades include the Erskine Park Link Road connecting Erskine Park to Wallgrove Road, the route that would be used to transport waste feedstock from Erskine Park to WSERRC. Traffic associated with the expansion of Erskine Park would likely be managed within the existing road network, given recent upgrades.
Social	*Potential construction impacts* • Positive social impact of additional employment in construction of the expansion • Potential negative social impact to amenity of the surrounding area in construction. *Potential operation impacts* • Positive social impacts of potential additional employment opportunities.	The key social impacts that may result from an expansion of the Waste Transfer Station are those relating to potential amenity impacts, such as noise, air and odour, dust and traffic. Existing mitigation measures and compliance with existing EPL conditions would allow an expanded facility to maintain its existing environmental performance and to avoid negative social impacts.

22.3 IBA processing facility

22.3.1 Description

The combustion of waste creates ash by-products, which is a residual waste material leftover from the EfW process. The WSERRC proposal will produce three types of ash: incinerator bottom ash (IBA), boiler fly ash and flue gas treatment residues (FGTr).

As part of the WSERRC proposal, FGTr would be collected and transported for pre-treatment to Cleanaway's existing hazardous solid waste treatment facility located in St Marys before being disposed to an existing licenced restricted solid waste landfill facility such as at Kemps Creek, as described in **Chapter 3 Proposal description**. Part of the boiler fly ash stream is captured with the IBA and part of this ash stream is captured with the FGTr and will be transported for disposal according to the ash type it is collected with.

IBA is the mostly inert, non-combustible component of the waste that is left over at the end of the combustion process and is collected at the bottom of the grate. About 65,800tpa of IBA (dry weight) is expected to be generated from the EfW facility. The WSERRC proposal would include a ferrous metal separator onsite, to recover large ferrous metals from the IBA which will be deposited into a storage container onsite for recovery and sale.

Options to recover IBA for use in construction products are being investigated, based on practices in other jurisdictions. Subject to the outcome of these investigations, the IBA may be transported to a dedicated ash facility (or ash management infrastructure as per the SEARs) which is the related development.

Treatment and recovery of non-ferrous metals (or secondary metals recovery) and maturation of the IBA to become incinerator bottom ash aggregate (IBAA) before it being used in construction materials may be carried out at this facility. Although not yet a well-known practice in Australia, IBAA is currently used in the UK and Europe in a variety of construction products, including aggregates, roads and landfill capping material, and this will be investigated further as part of the ash treatment facility proposal. A resource recovery order and exemption will first need to be gained, and market development will need to be prepared to enable this reuse pathway. This will be progressed in parallel with the development process to establish resource recovery pathways for the IBA.

If the resource recovery pathways have not been established for the IBA before commissioning of the WSERRC, bottom ash will be disposed at a suitably licenced landfill as general solid waste (non-putrescible), until a suitable reuse is arranged.

22.3.2 Approval process and indicative timing

The approval process for the ash facility will depend on how quickly a solution is found for the reuse of the IBA. Although the EfW facility generates about 65,800tpa of IBA (dry weight), the ash storage facility may be handling over 100,000t by Year 2 and so is likely to trigger an SSD approval pathway. In this scenario, the IBA treatment facility would be assessed as an SSD because it meets the definition of SSD under clause 23 of Schedule 1 of the State Environmental Planning Policy (State and Regional Development) 2011 (SRD SEPP):

> *(2) Development for the purpose of waste or resource transfer stations in metropolitan areas of the Sydney region that handle more than 100,000 tonnes per year of waste.*
>
> *(3) Development for the purpose of resource recovery or recycling facilities that handle more than 100,000 tonnes per year of waste.*

However, if the proposal was not classified as SSD, then it would most likely be assessed as Designated Development (DD) under clause 32 of Schedule 3 to the *Environmental Planning and Assessment Regulation 2000*.

Waste projects that trigger DD automatically trigger Regionally Significant Development (RSD) which is defined under clause 7 of Schedule 7 of the State Environmental Planning Policy (State and Regional Development) 2011 (SRD SEPP):

> *Development for the purposes of waste management facilities or works, which meet the requirements for designated development under clause 32 of Schedule 3 to the Environmental Planning and Assessment Regulation 2000.*

RSD is assessed under Part 4 of the EP&A Act with the relevant Regional Panel acting as consent authority.

Table 22.4 shows the indicative timeframes for planning approval, construction and operation.

Table 22.4: Indicative timeframes for ash storage and secondary metals recovery planning approval and construction

WSERRC Related development	Planning pathway	Planning approval timeframe	Construction timeframe	Total time to operation
WSERRC	SSD	18 months	3 1/4 years	5 years
Ash storage and secondary metals recovery	SSD or DD RSD	12–18 months	6 months	2 years

22.3.3 Environmental impacts

Selection of a site for a potential IBA treatment facility would consider suitable site zoning, the availability of supporting infrastructure such as road access, avoidance of environmental constraints and appropriate buffer distances to residential areas to minimise offsite amenity impacts.

Potential impacts of an ash treatment facility are likely to be associated with the operations of the facility as described in the table below. Impacts associated with site development are dependent on the specific site characteristics but may include soil, surface water and contamination, among others, which can be managed through standard construction environmental management methods.

Table 22.5: Ash storage and secondary metals recovery potential environmental impacts

Environmental aspect	Assessment of environmental impact	Management of environmental impact
Air quality	*Potential construction impacts* • Emissions from the use of construction vehicles • Dust generated in construction of the facility, installation of equipment and movement of vehicles. *Potential operation impacts* • Dust impacts due the movement, handling and processing of ash material • Emissions generated by vehicles accessing the site and the movement of waste material onsite by equipment.	Construction impacts would be managed by dust mitigation measures included in a Dust Management Plan as part of a Construction Environment Management Plan (CEMP). The design of the facility and operation would manage dust impacts by: • Using enclosed vehicles for the transportation of the IBA • Suppressing of dust using water.
Noise and vibration	*Potential construction impacts* • Noise and vibration impacts resulting from operation of construction equipment. *Potential operation impacts* • Operational noise and vibration impacts resulting from the movement of trucks and operation of plant and equipment.	Construction Noise and Vibration Management Plan (CNVMP) will be prepared and used to mitigate construction impacts. The location of the chosen site would be in an appropriately zoned area, separated from residential areas, which will minimise operational noise impacts.

Environmental aspect	Assessment of environmental impact	Management of environmental impact
Traffic and transport	*Potential construction impacts* • Traffic movements from construction vehicles in and out of the site. *Potential operation impacts* • An increase in traffic on the nearby road network in operation of the facility.	Construction traffic impacts would be managed by a Construction Traffic Management Plan (CTMP). The site chosen would make sure there is appropriate road infrastructure surrounding the site so any additional traffic from the proposal does not cause adverse impacts on the operation of the road network.
Social	*Potential construction impacts* • Temporary increased traffic, noise, amenity • Temporary job creation.	The location of the site and use of mitigation measures would reduce amenity impacts to the nearest residential areas, minimising social impacts.
Water	*Potential operation impacts* • Potential impacts to surface and groundwater as a result of storage of the IBA.	Potential surface and groundwater impacts that may result from the long-term storage of ash would be mitigated using an appropriate liner material and standard surface water controls.

22.4 Electrical connection to the high-voltage network

22.4.1 Description

Any works related to utilities and services outside the proposal site are considered related development. For utility connections within the proposal site, details are available in **Chapter 20 Utilities and services**.

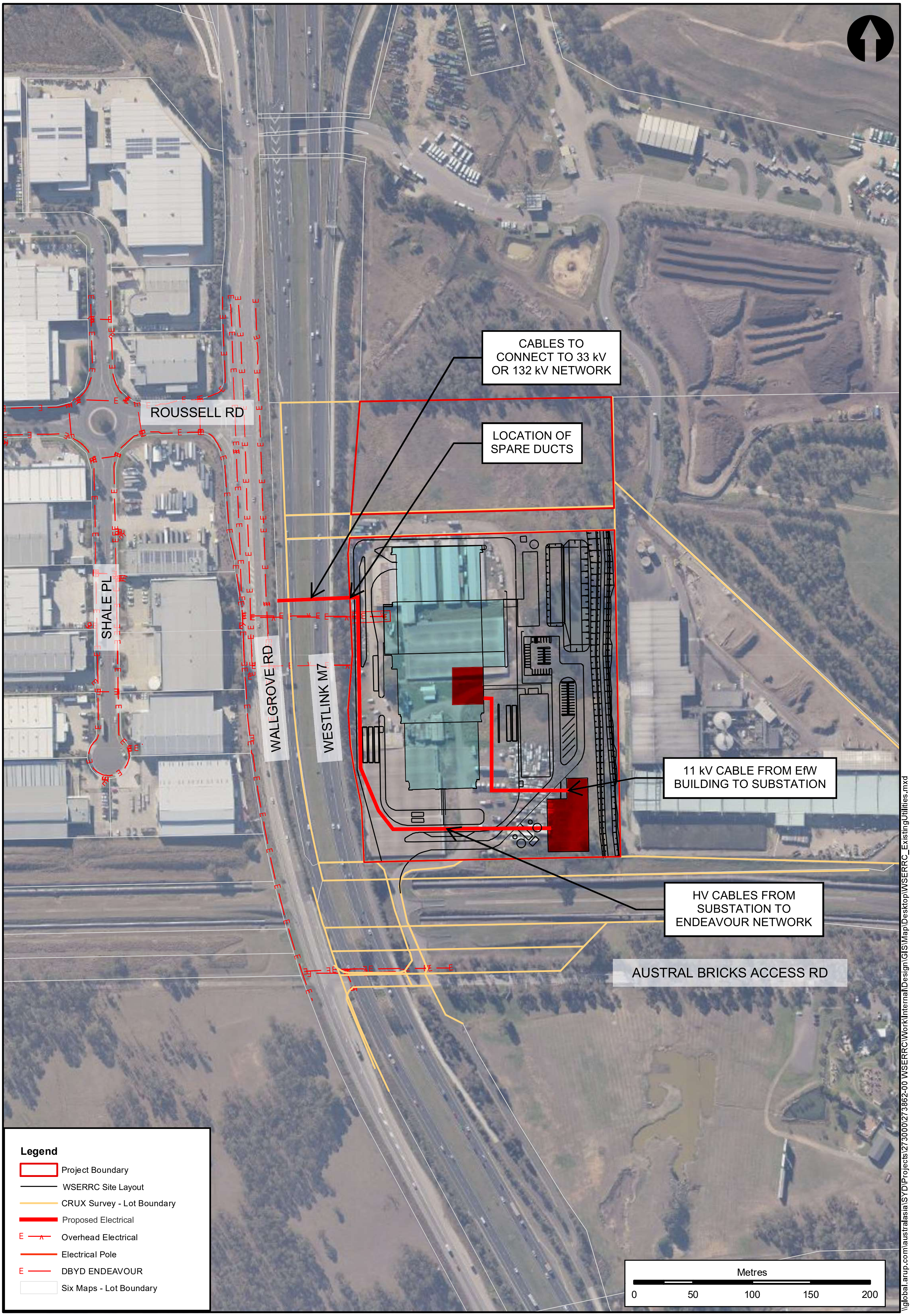
The WSERRC proposal will be designed to generate up to 58MW of base load electricity, some of which would be used to power the facility itself, with up to 55MW exported to the grid. This is a provisional assessment and would be verified with more detailed modelling by Endeavour Energy in detailed design.

To export and import energy to and from the grid, the proposal will require a new connection to the electricity grid. These connection works are related development.

Different options for connection have been discussed with network operators. Three feasible route options to connect WSERRC to the grid have been presented by Endeavour Energy (see Appendix D of **Technical report P Utilities and Services**). This comprises two 33kV options and one 132kV option. All options have been deemed to be technically feasible, offering a viable connection to the local transmission network.

The points of connection for both 33kV and 132kV are west of the proposal boundary (**Figure 22.2**), with the 33kV connection being adjacent to Wallgrove Road. The connection from the proposal site boundary to the 33kV or 132kV feeder offsite will be planned and executed by Endeavour Energy. New infrastructure to connect the site to the points of grid connection would pass through areas that are characterised by transport infrastructure and industrial land uses.

The electrical connection will likely need easements for these assets that pass over private or public land. The creation of an easement is the preferred method of achieving property tenure for network assets. To maintain the safety and reliability of the network, electricity easements grant Endeavour Energy access rights to enter property and to control the use of land near powerlines, underground cables and substations. The works will be designed and constructed by an Accredited Service Provider (ASP) selected by the applicant. The ASP will submit their designs to Endeavour Energy for review and approval before construction.



Service Layer Credits:
© Arup 2020

Figure 22.2: WSERRC electrical connection options

22.4.2 Approval process and indicative timing

Part 5 of the EP&A Act allows for certain activities to be carried out by or on behalf of public authorities without consent. However, public authorities must consider the environmental impacts of the activity when thinking whether to approve the activity.

It is likely that the proposed electrical connection for WSERRC will be assessed under Part 5 of the EP&A Act.

For the purposes of this assessment, it is assumed that the works will not trigger the need for State significant infrastructure (SSI).

Table 22.6 shows the indicative timeframes for planning approval, construction and operation.

Table 22.6: Indicative timeframes for electrical connection planning approval and construction

WSERRC Related development	Planning pathway	Planning approval timeframe	Construction timeframe	Total time to operation
WSERRC	SSD	18 months	3 1/4 years	5 years
Electrical connection to high voltage network	Part 5 Public authority activity (Endeavour Energy – Electricity Supply Authority)	6–12 months	12–18 months	2.5 years

22.4.3 Environmental impacts

To minimise excavations and mitigate disruptions to the M7 and Wallgrove Road in connection works to Endeavour Energy’s grid network, it is proposed to use existing electrical conduits owned by Endeavour Energy that cross under the M7.

Service providers likely to experience temporary interruption of service as a result of connection works in construction will be contacted before the start of activities, to avoid impacts to the existing networks.

Table 22.7: Electrical connection to high-voltage network potential environmental impacts

Environmental aspect	Assessment of environmental impact	Management of environmental impact
Air quality and odour	*Potential construction impacts* • Increased emissions from the use of construction vehicles • Increased dust generated in electrical wiring upgrades and installation of new wiring.	Construction impacts would be managed by dust mitigation measures included in a Dust Management Plan as part of a Construction Environment Management Plan (CEMP).
Noise and vibration	*Potential construction impacts* • Increased noise and vibration impacts resulting from operation of construction equipment.	Construction Noise and Vibration Management Plan (CNVMP) will be prepared and used to mitigate construction impacts.
Traffic and transport	*Potential construction impacts* • A temporary closure of roads/disruption to traffic where wiring is being installed/upgraded.	Construction traffic impacts would be managed by a Construction Traffic Management Plan (CTMP). Where possible, existing conduits for electrical reticulation will be used. Where new conduits are needed to allow the cable route, these would likely be installed by boring under the M7 and Wallgrove Road, to avoid disruptions to the road network. Trenching in road reserves may also be used for further connections with localised traffic control. Ideally, any electrical conduits would be placed within the existing road reserve and/or footpath verge, to minimise impacts on the road carriage, so footpaths may be temporarily closed. It is proposed that if construction is needed within or adjacent to a road carriageway, it would be done in stages, with appropriate traffic management for minimal disruption to the traffic.
Soils and geology	*Potential construction impacts* • Disturbance of soils has the potential to result in erosion and sediment runoff.	An Erosion and Sediment Control Plan (ESCP) would be prepared and carried out, outlining measures for the prevention of erosion and sedimentation in construction.

Environmental aspect	Assessment of environmental impact	Management of environmental impact
Surface water and groundwater	*Potential construction impacts* • Interception of groundwater in installation • Potential contamination of stormwater, soil and groundwater due to accidental spills • Potential contamination of stormwater runoff from erosion and sedimentation.	If necessary, groundwater and contamination sampling would be monitored in construction. Erosion and sediment control measures would prevent potential contamination of stormwater runoff.
Social	*Potential construction impacts* • Temporary disruption to electricity services in upgrades/installation • Temporary increase in traffic and noise • Temporary job creation.	Managing and mitigating amenity impacts, such as noise and air quality, would also reduce social impacts. Information on proposed construction activities would be offered to local residents before construction activities as part of communication strategy and standard project development practices.
Property	*Potential construction impacts* • Route connection options would pass through industrial land and transport infrastructure thus potentially disrupting property owners or users of the land. *Potential operation impacts* • Potential disruption to property owners in cases of maintenance.	Property impacts would be minimised through the construction method. It is the responsibility of the applicant to acquire any easements for these assets that pass over private or public land.

22.5 Water and sewer connection

22.5.1 Description

Any works related to utilities and services outside the proposal site are considered related development. Details on utility connections within the proposal site are available in **Chapter 20 Utilities and services**.

Water

The WSERRC proposal needs water for three main uses:

- Potable water – drinking water and cleaning facilities (drinking water, showers). This includes an allowance for water used for facility washdown and cleaning.
- Fire water – water serving fire hydrants, water cannons and sprinkler systems
- Process water – water to be fed into the boiler.

To supply the proposal site with enough water, connections to offsite utilities and services are needed.

It is proposed to connect the WSERRC proposal to a potable water supply using the existing service main at Roussell Road (**Figure 22.3**). Separate water and fire mains are proposed from this connection point to service the WSERRC site. Process water will also be sourced from this potable water connection point.

The exact route of the potable water connection is to be confirmed in detailed design, however the preferred route crosses underneath the M7. To avoid open-cut trenching of the M7, which would cause significant disruption, it is proposed to use existing spare conduits that cross under the M7. Should these spare conduits not be suitable, the intention is to thrust bore underneath the motorway and Wallgrove Road. Sydney Water has confirmed that other developments have previously created potable water and other services crossings under the M7. Disconnection and decommissioning details of the legacy connection to the Warragamba Pipelines will be confirmed in detailed design, following agreement with WaterNSW.

Sewer connection

The WSERRC proposal will need to discharge wastewater from onsite welfare facilities (kitchens and toilets) and general site uses, such as washdowns and cleaning. Process water would be wholly consumed in the EfW process, so no process water would be discharged to sewer. So, sewer discharge rates are relatively low.

It is proposed to connect the WSERRC proposal to sewer by means of the existing vitrified clay (VC) sewer pipe gravity sewer at the intersection of Clay Place and Roussell Road (**Figure 22.4**). The exact route of sewer connection is to be confirmed in detailed design, however the preferred route crosses underneath the M7. To avoid open-cut trenching of the M7, which would cause significant disruption, it is proposed to use existing spare conduits that cross under the M7. If these spare conduits are not suitable, the intention is to thrust bore underneath the M7 and Wallgrove Road for sewer (wastewater) connections to existing Sydney Water infrastructure networks.

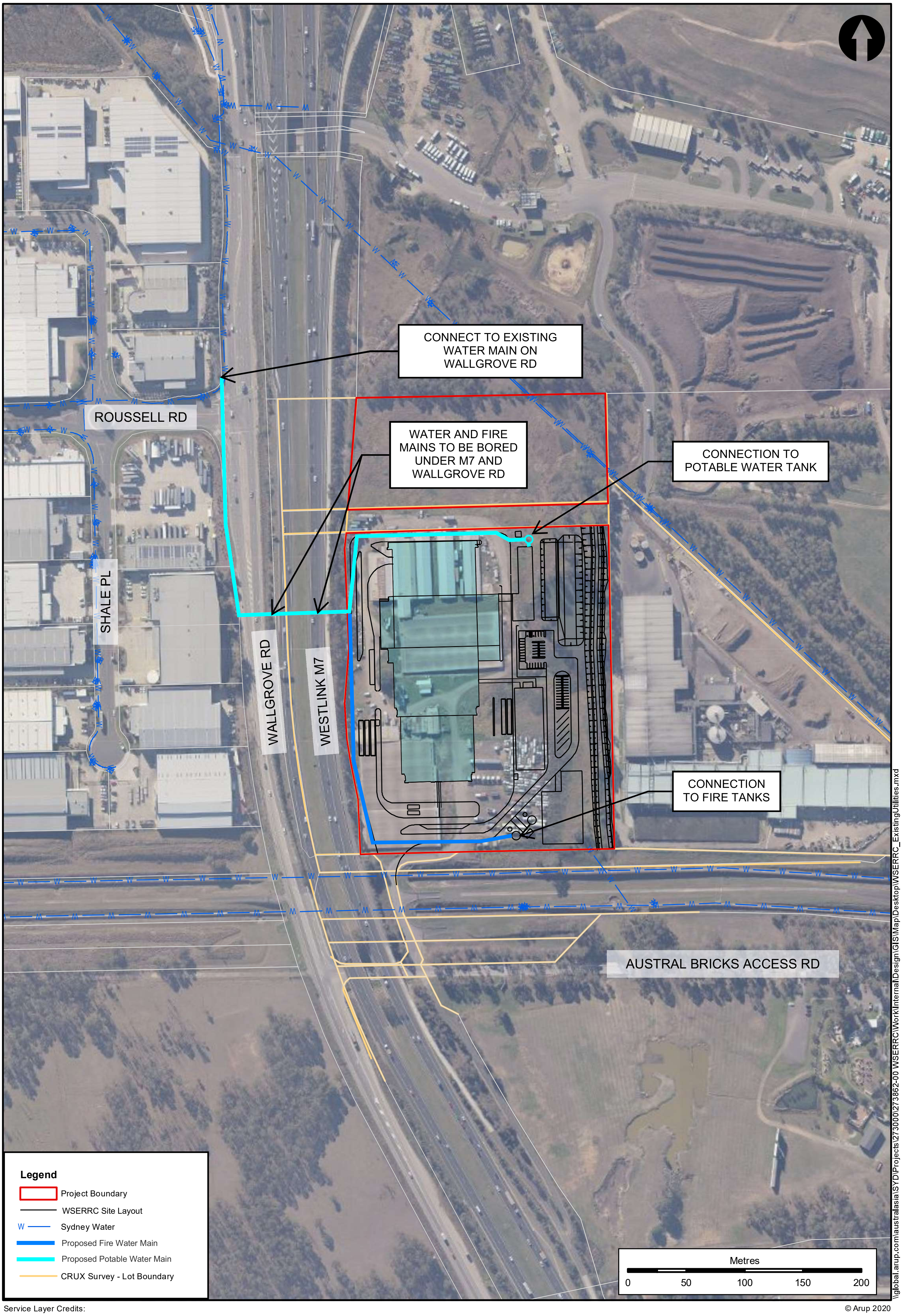
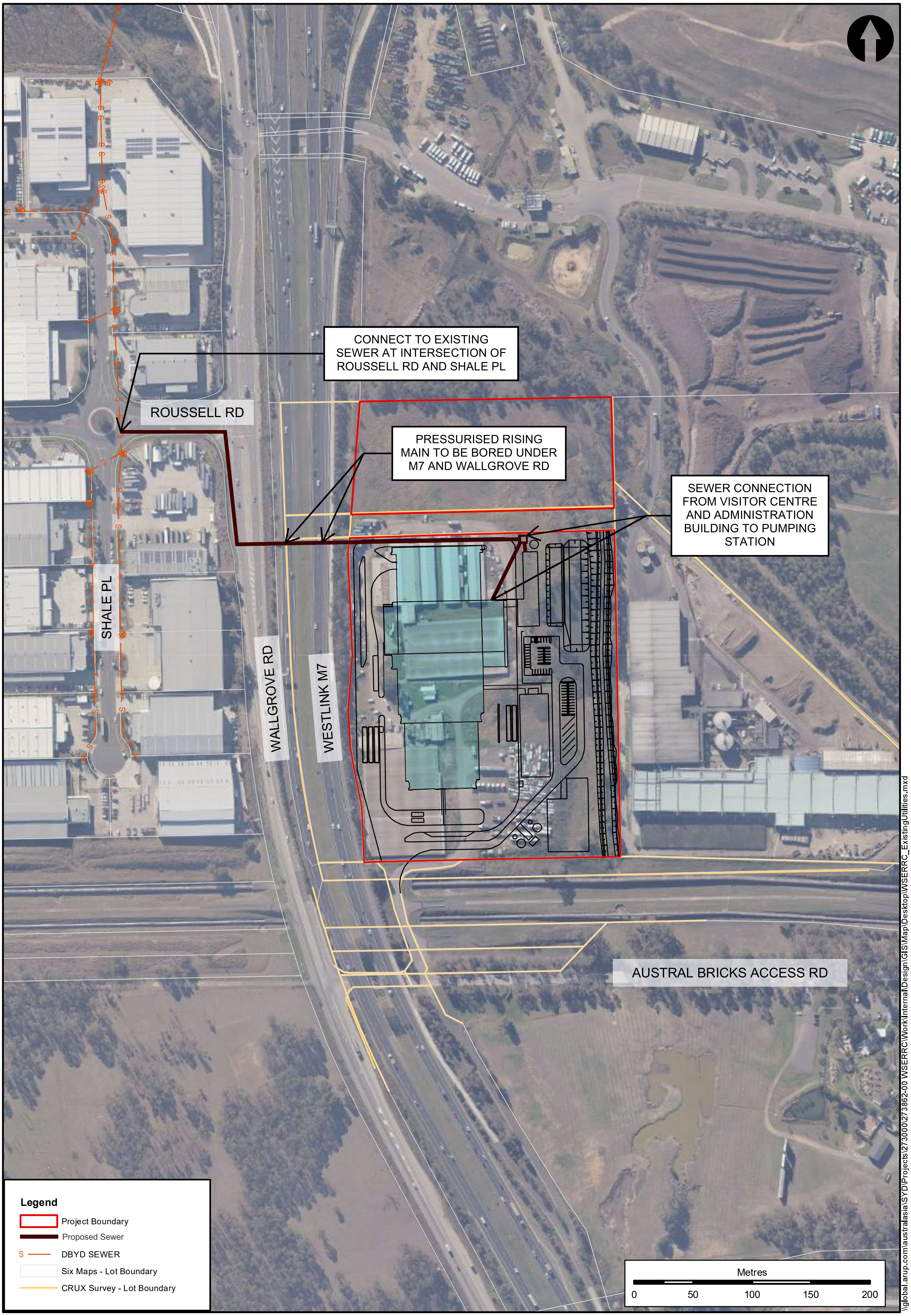


Figure 22.3: WSERRC water connection



Service Layer Credits:

Figure 22.4: WSERRC sewer connection

22.5.2 Approval process and indicative timing

The sewer and water connection for WSERRC will be assessed under Part 5 of the EP&A Act as an activity to be carried out by or on behalf of a public authority without consent.

A detailed connection assessment for both sewer and water will be completed by a water servicing coordinator (WSC) and an application for a section 73 Certificate through a WSC may be needed. A section 73 Compliance Certificate confirms that the applicant has satisfied Sydney Water needs to adequately service the development with water, wastewater and stormwater services.

Table 22.8 shows the indicative timeframes for planning approval, construction and operation.

Table 22.8: Indicative timeframes for water and sewer connections planning approval and construction

WSERRC Related development	Planning pathway	Planning approval timeframe	Construction timeframe	Total time to operation
WSERRC	SSD	18 months	3 1/4 years	5 years
Water and sewer connections	Part 5 Public authority activity	6–8 months	4–6 months	14 months

22.5.3 Environmental impacts

The exact route of the potable water and sewer connection is to be confirmed in detailed design. However, the preferred route crosses underneath the M7. The potential impacts relating to this scenario are summarised below.

Table 22.9: Water and sewer connection potential environmental impacts

Environmental aspect	Assessment of environmental impact	Management of environmental impact
Air quality and odour	*Potential construction impacts* • Increased emissions from the use of construction vehicles • Increased dust generated in installation of pipelines and or boring.	Construction impacts would be managed by dust mitigation measures included in a Dust Management Plan as part of a Construction Environment Management Plan (CEMP).
Noise and vibration	*Potential construction impacts* • Increased noise and vibration impacts resulting from operation of construction equipment.	Construction Noise and Vibration Management Plan (CNVMP) will be prepared and used to mitigate construction impacts.

Environmental aspect	Assessment of environmental impact	Management of environmental impact
Traffic and transport	*Potential construction impacts* • A temporary closure of roads/disruption to traffic where pipelines are being installed.	Construction traffic impacts would be managed by a Construction Traffic Management Plan (CTMP).
Soils and geology	*Potential construction impacts* • Disturbance of soils has the potential to result in erosion and sediment runoff.	An Erosion and Sediment Control Plan (ESCP) would be prepared and carried out, outlining measures for the prevention of erosion and sedimentation in construction.
Surface water and groundwater	*Potential construction impacts* • Interception of groundwater in installation • Potential contamination of stormwater, soil and groundwater due to accidental spills • Potential contamination of stormwater runoff from erosion and sedimentation.	If necessary, groundwater and contamination sampling could be monitored in construction. Erosion and sediment control measures would avoid potential contamination of stormwater runoff.
Social	*Potential construction impacts* • Temporary disruption to water and sewer services in upgrades/installation • Temporary increase in traffic and noise • Temporary job creation.	Managing and mitigating amenity impacts, such as noise and air quality, would also reduce social impacts. Information on proposed construction activities would be offered to local residents before construction activities as part of a communication strategy and standard project development practices.
Property	*Potential construction impacts* • Route connection options would pass through industrial land and transport infrastructure, potentially disrupting property owners or users of the land.	Property impacts would be minimised through the construction method. It is the responsibility of the applicant to acquire any easements for these assets that pass over private or public land.

22.6 Telecommunications connection

22.6.1 Description

To control and monitor all processes and components in operation, and to support automatic operation of the EfW facility, a Continuous Emissions Monitoring System (CEMS) is needed.

The operation of the CEMS requires an extensive communication network. To enable the continuous operation of the EfW facility and to mitigate the impact of external factors, a hard-wired telecommunications connection has been proposed.

A Fibre to the Premises (FTTP) connection by NBN is proposed to offer a hard-wired service connection to the site. NBN has confirmed that it will be able to coordinate and help the construction of additional infrastructure to connect to the existing NBN network infrastructure on Wallgrove Road to the south of the proposal site and to follow the existing access road into the proposal site.

22.6.2 Approval process and indicative timing

The telecommunications connection for WSERRC will be assessed under the processes in the *Telecommunications Act 1997 (Cth)* and, if necessary, the EP&A Act. The precise process will depend on the scope and location of works.

An application was submitted to NBN through its Technology Choice Program. The Technology Choice Program enables parties to change their NBN access network technology at their own cost. NBN sent a build quote, however this will need to be re-applied for at a later stage. The NBN Build Quote is included as Appendix E in **Technical report P Utilities and Services**. The build quote notes that any relevant approvals and access arrangements for civil works outside of the property boundary to connect the premises to the NBN access network will be carried out by NBN.

Table 22.10 shows the indicative timeframes for planning approval, construction and operation.

Table 22.10: Indicative timeframes for telecommunications connection works planning approval and construction

WSERRC Related development	Planning pathway	Planning approval timeframe	Construction timeframe	Total time to operation
WSERRC	SSD	18 months	3 1/4 years	5 years
Telecommunications connection	Planning approval is not likely to be needed – planning pathway to be assessed if necessary.	4–6 months (if needed)	4–6 months	1 year

22.6.3 Environmental impacts

It is likely that the potential construction and operation environmental impacts as a result of connecting to the NBN network will be low.

The exact route for the telecommunications connection is to be confirmed in detailed design. However, the preferred route would cross underneath the M7, so potential impacts relating to this scenario have been summarised below.

Table 22.11: Telecommunications connection potential environmental impacts

Environmental aspect	Assessment of environmental impact	Management of environmental impact
Air quality and odour	*Potential construction impacts* • Increased emissions from the use of construction vehicles • Increased dust generated in installation of cables and or boring.	Construction impacts would be managed by dust mitigation measures included in a Dust Management Plan as part of a Construction Environment Management Plan (CEMP).
Noise and vibration	*Potential construction impacts* • Increased noise and vibration impacts resulting from operation of construction equipment.	Construction Noise and Vibration Management Plan (CNVMP) will be prepared and used to mitigate construction impacts.
Traffic and transport	*Potential construction impacts* • A temporary closure of roads/disruption to traffic where cables are being installed.	Construction traffic impacts would be managed by a Construction Traffic Management Plan (CTMP).
Soils and geology	*Potential construction impacts* • Disturbance of soils has the potential to result in erosion and sediment runoff.	An Erosion and Sediment Control Plan (ESCP) would be prepared and carried out, outlining measures for the prevention of erosion and sedimentation in construction.
Surface water and groundwater	*Potential construction impacts* • Interception of groundwater in installation • Potential contamination of stormwater, soil and groundwater due to accidental spills • Potential contamination of stormwater runoff from erosion and sedimentation.	If necessary, groundwater and contamination sampling could be monitored in construction. Erosion and sediment control measures would avoid potential contamination of stormwater runoff

Environmental aspect	Assessment of environmental impact	Management of environmental impact
Social	*Potential construction impacts* • Temporary disruption to telecommunication services in upgrades/installation • Temporary increased traffic, noise, amenity • Temporary job creation.	Managing and mitigating amenity impacts, such as noise and air quality, would also reduce social impacts. Information on proposed construction activities would be offered to local residents before construction activities as part of a communication strategy and standard project development practices.
Property	*Potential construction impacts* • Route connection options may pass through industrial land and transport infrastructure thus potentially disrupting property owners or users of the land.	Property impacts would be minimised through the construction method. It is the responsibility of the applicant to acquire any easements for these assets that pass over private or public land.

22.7 Site access works

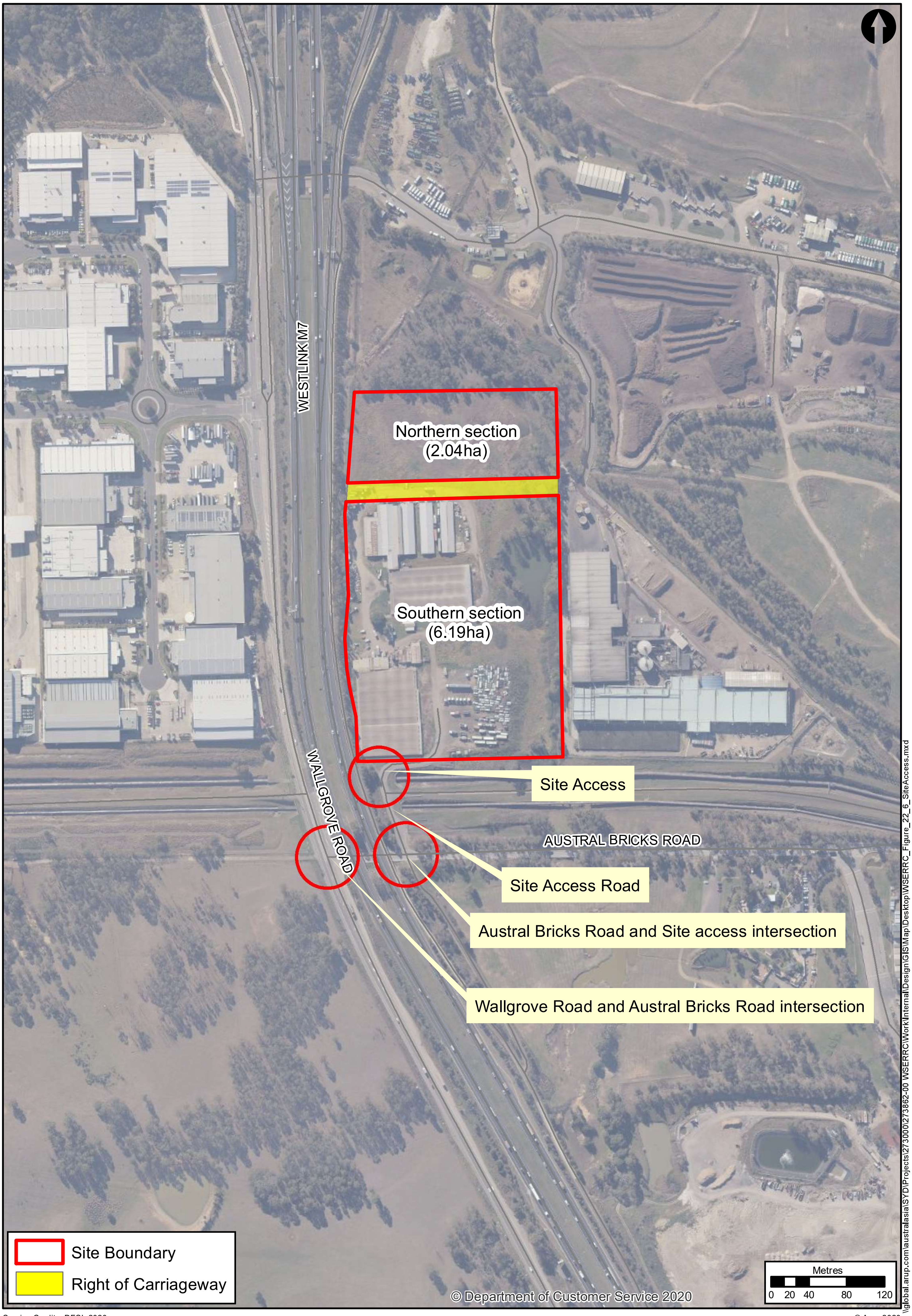
22.7.1 Description

Access to the site is via an existing access off Austral Bricks Road which crosses over the Warragamba pipelines corridor and into the proposal site (**Figure 22.5**). This existing access was constructed by concrete encasing the two existing WaterNSW pipelines.

Site access needs to be upgraded to accommodate the proposals traffic movements and to allow access to the pipelines for maintenance. The existing access will be upgraded to accommodate two-way B-double type heavy vehicle movements and will be designed to comply with the relevant Australian Standards. A vehicle swept analysis of the proposed access has been conducted using expected design vehicles (including B-doubles) and is included in Appendix B of **Technical report K.**

The proposed solution for site access is widening the existing site access to the east, with no additional covering of the pipelines. These site access works and any corresponding road upgrades are related development and do not form part of the WSERRC proposal.

The preferred access solution has been agreed in principle with WaterNSW. Ongoing consultation will continue with WaterNSW, to agree the detailed design and construction method.



Service Credits: DFSI, 2020

Figure 22.5: WSERRC site access

22.7.2 Approval process and indicative timing

The site access works for WSERRC are likely to be assessed under Part 5 of the EP&A Act as an activity carried out by or on behalf of a public authority without consent.

The site access carriageway is partially owned by Transport for New South Wales (TfNSW) and partially owned by WaterNSW. Consultation is ongoing between WaterNSW, TfNSW and the applicant about finalising site access arrangements.

Table 22.12 shows the indicative timeframes for planning approval, construction and operation. The timeframe for planning approval and construction is likely to be longer than standard site access works, given the ownership complexity and the interface with the WaterNSW Warragamba Pipelines.

Table 22.12: Indicative timeframes for site access works planning approval and construction

WSERRC Related development	Planning pathway	Planning approval timeframe	Construction timeframe	Total time to operation
WSERRC	SSD	18 months	3 1/4 years	5 years
Site access works	Likely to be Part 5 Public authority activity	6–12 months	8–12months	2 years

22.7.3 Environmental impacts

In the initial design period, four alternative site access options were investigated. These alternative site access options are discussed in **Section 2.6.7** of **Chapter 2 Strategic context**.

The proposed solution for site access is widening the existing site access to the east. This will involve the following:

- Clearing existing vegetation/trees, south of the pipeline corridor, to enable construction of the widened junction with Austral Brick Road
- Removing existing damaged asphalt wearing course and existing vehicle barriers
- Excavation of existing verge to form new pavement construction
- Construction of widened carriageway to TfNSW specifications, including asphalt concrete wearing course. Widening works of the access tracks would allow unobstructed two-way travel of vehicles onto Austral Bricks Access Road and onto Wallgrove Road.
- Installation of new vehicle barriers
- Reprofiling verge from edge of widened carriageway to back of existing headwalls
- Relocation of security fencing, including gate to access track.

No additional covering of the pipelines is proposed.

A risk assessment of the potential impacts to the Warragamba Pipelines Corridor has been completed and is included as Appendix A of **Technical report P Utilities and Services**. This considers the Guidelines for Development Adjacent to the Upper Canal and Warragamba Pipelines (WaterNSW, 2020).

The potential environment impacts for upgrading the current site access have been summarised below.

Table 22.13: Site access works potential environmental impacts

Environmental aspect	Assessment of environmental impact	Management of environmental impact
Property	*Potential construction impacts* • Restricting access to pipelines. *Potential operation impacts* • Restricting access to pipelines.	Widening works will be staged to maintain access to the pipeline corridor. Specific details will be developed in detailed design. The widening works include connection to the existing access tracks to allow WaterNSW to access their pipeline assets.
Air quality and odour	*Potential construction impacts* • Increased emissions from the use of construction vehicles • Increased dust generated in road upgrades.	Construction impacts would be managed by dust mitigation measures included in a Dust Management Plan as part of a Construction Environment Management Plan (CEMP).
Noise and vibration	*Potential construction impacts* • Increased noise and vibration impacts resulting from operation of construction equipment. *Potential operation impacts* • Operational noise and vibration impacts resulting from the movement of vehicles at a new road intersection.	Construction Noise and Vibration Management Plan (CNVMP) will be prepared and used to mitigate construction impacts. Potential vibration impacts on the Warragamba pipelines in operation will be mitigated by the design of the access road.
Traffic and transport	*Potential construction impacts* • A temporary increase in traffic generation from construction vehicles. *Potential operation impacts* • A change to existing road intersections and access, including increased vehicle movements.	Construction traffic impacts would be managed by a Construction Traffic Management Plan (CTMP). The proposed site access has been assessed in **Chapter 15 Traffic and transport** and **Technical report K Traffic and Transport Assessment Report**. The intersection between the site access and Austral Bricks Road will maintain the existing level of service.

Environmental aspect	Assessment of environmental impact	Management of environmental impact
Soils and geology	*Potential construction impacts* • Earthworks and potential vegetation removal may cause soil erosion and sedimentation, including potential for sediment laden runoff. • Potentially contaminated soil or fill material within the proposal area may present a hazard to construction workers or others through dermal (skin) contact, ingestion and inhalation. • Potential impact of excavation of contaminated material on the environment includes water pollution and airborne dispersal of contaminants.	If necessary, groundwater and contamination sampling could be monitored in construction. Erosion and sediment control measures would avoid potential contamination of stormwater runoff.
Surface water and groundwater	*Potential construction impacts* • Accidental spill or discharge of chemicals or hydrocarbons, such as fuels and oils in vehicles and/or equipment. Potential to contaminate both surface water and groundwater table. • Erosion of soil and sedimentation through stormwater runoff.	Any impacts from spills or discharge would be managed by a Spill Management Plan. Erosion and sediment control measures would avoid potential contamination of stormwater runoff.
Biodiversity	*Potential construction impacts* • Clearing, removal and disturbance of vegetation • Introduction and spread of invasive species and weeds • Disturbance to fauna and habitat.	Any impacts to biodiversity would be managed by a Flora and Fauna Management Plan.
Social	*Potential construction impacts* • Temporary increase in traffic and noise • Temporary job creation.	Managing and mitigating amenity impacts, such as noise and air quality, would also reduce social impacts. Information on proposed construction activities would be offered to local residents before construction activities as part of a communication strategy and standard project development practices.

Chapter 23

Cumulative impacts

23 Cumulative impacts

The SEARs require an assessment of the

'potential impacts of all stages of the development, including any cumulative impacts of the proposed facility with any approved (but not yet constructed) developments, including The Next Generation's proposal for an energy from waste facility at Eastern Creek (currently subject to proceedings in the NSW Land and Environment Court).'

There is no conventional method for the assessment of cumulative impacts in New South Wales. However, the following approach has been adopted:

- Confirming the scope of cumulative impact assessment by:
    - Recognising projects within a 3km radius of WSERRC, based on the spatial extent of impacts from WSERRC
    - Recognising projects that are likely to proceed by focusing on those projects that are approved but not yet constructed or at an advanced stage in the planning process
- Reviewing the New South Wales planning portal for major projects
- Reviewing environmental impact assessment data for those projects included in the scope of the cumulative impact assessment to see how their impacts may overlap with impacts from WSERRC
- Completing a qualitative cumulative impact assessment of WSERRC with the identified projects, and, where relevant, developing management and mitigation measures.

A quantitative cumulative air quality impact assessment of WSERRC with the DADI Next Generation proposal has also been prepared. It is reported in **Chapter 8 Air quality and odour** and summarised here.

23.1 Identifying relevant projects

The spatial extent of impacts from WSERRC is different for each assessment matter. Emissions-based impacts such as air, noise and health tend to have a greater spatial extent than impacts which are typically confined to the site area, such as biodiversity and heritage. However, site-based impacts may also be considered to overlap with offsite impacts if they are seen as part of a broader pattern of loss of environmental values, such as biodiversity.

Based on a 3km study area adopted for the air quality assessment, the cumulative impact assessment has also adopted a 3km radius study area.

A search of the Department's Major Projects register was performed in May 2020, to identify the approved developments within 3km of the proposal site, as well as other relevant developments not yet approved. **Table 23.1** and **Figure 23.1** describe major projects.

The Next Generation facility is expressly mentioned in the SEARs, so while it is more than 3km from the proposal site, it is included in this assessment.

Western Sydney Airport (WSA) is at least 15km away from the proposal, so potential cumulative impacts were not considered with this proposal. A review of the WSA impact assessment shows that it would not affect the background concentration levels for air quality near the proposal, as noted in the Air Quality and Odour Impact Assessment (**Technical report A**).

Table 23.1: NSW Major Projects

Location	Applicant	Proposed development	Status
Honeycomb Drive, Eastern Creek	The Next Generation (NSW) Pty Ltd	**Eastern Creek Energy from Waste Facility** The construction and operation of an energy from waste facility.	Currently being assessed by the NSW Land and Environment Court
780 Wallgrove Road, Eastern Creek	The Austral Brick Co Pty Ltd	**Horsley Park Brickworks Plant 2 Upgrade** Proposed upgrade works to existing Plant 2 brick making facility including replacement of existing two kilns, with one new kiln and alterations and additions to the existing production building. The proposal does not seek to alter the current production capacity of the site.	Approved (May 2020)
813–913 Wallgrove Road, Horsley Park	Gazcorp Pty Ltd	**Gazcorp Industrial Estate** Concept Proposal for an industrial estate with 16 warehouses and a concurrent Stage 1 Development Application (DA). The Concept Proposal was approved for a maximum gross floor area (GFA) of 211,550m^2 across 16 development lots as well as site levels, landscaping, infrastructure services and development controls. The Stage 1 DA was approved for the construction and operation of a 45,225m^2 warehouse with ancillary office space on proposed Lot 10 as well as bulk and detailed earthworks, construction of internal access roads and estate-wide street landscaping.	Approved (November 2019)
165 Wallgrove Road and 475 Ferrers Road, Eastern Creek	Western Sydney Parklands Trust	**Light Horse Interchange Business Hub Eastern Creek** Concept proposal for the staged development of a 29.4ha business park (known as the Light Horse Interchange Business Hub) and a detailed proposal for the Stage 1 works.	Assessment (Further information requested March 2020)

Location	Applicant	Proposed development	Status
17 Roberts Road, Eastern Creek	Hindmarsh Construction Australia Pty Ltd	**Roberts Road Data Centre** Construction and operation of a data storage facility.	Response to submissions (Requested February 2020)
194–202 Chandos Road, Horsley Park	Jemena Gas Networks (NSW) Ltd	**Western Sydney Green Gas Project** A 5-year trial to construct a Power to Gas facility at an existing Facility at Horsley Park, inject hydrogen gas into the Sydney secondary gas distribution network, supply it for bus refuelling, and/or for power generation back into the grid.	Assessment (Further information requested May 2019)
Lot 3 DP 1225803, Lot 4 DP 1225803 and Lot 5 DP 1225803, Eastern Creek	Hanson Construction Materials Pty Ltd	**Eastern Creek Resource Recovery Facility** Construction and operation of a resource recovery facility comprising a concrete recycling plant with a processing capacity of 100,000tpa and a material storage depot with a capacity of 36,000tpa.	Prepare EIS (SEARs issued February 2019)
Lot 1 DP1077822, Lots A, B and C DP408966 and Lot 2 DP 1062965	Sydney Metro	**Sydney International Speedway** Construction and operation of a new speedway (Sydney International Speedway), including a clay-based racetrack, support infrastructure for competitors, support infrastructure for spectators and ancillary infrastructure and services.	Prepare EIS (SEARs issued May 2020)

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User CommunityDFSI 2020

Figure 23.1: Major projects surrounding the proposal site

23.2 Cumulative impact assessment

Table 23.2 outlines the key impacts for each project and the potential cumulative impacts which may arise when considered with impacts from WSERRC. These are considered both construction and operation impacts.

Table 23.2: Identification of key impacts and potential cumulative impacts

Proposed development	Key impact	Potential cumulative impact with WSERRC
Eastern Creek Energy from Waste Facility (Next Generation)	• Air quality and odour • Human health • Noise • Traffic • Waste • Social • Biodiversity	• Air quality and odour • Human health • Waste • Social • Biodiversity • Soils and water
Horsley Park Brickworks Plant 2 Upgrade	• Air quality and odour • Biodiversity • Noise • Traffic • Visual	• Air quality and odour • Noise • Traffic • Visual • Biodiversity • Soils and water
Gazcorp Industrial Estate	• Traffic • Noise • Biodiversity	• Traffic • Noise • Biodiversity • Soils and water
Light Horse Interchange Business Hub Eastern Creek	• Traffic • Contamination • Flooding • Biodiversity	• Traffic • Biodiversity
Roberts Road Data Centre	• Noise and vibration • Visual • Traffic • Biodiversity	• Noise • Traffic
Western Sydney Green Gas Project	• Air quality and odour • Hazards and risks • Noise and vibration • Traffic	• Air quality and odour • Traffic

Proposed development	Key impact	Potential cumulative impact with WSERRC
Eastern Creek Resource Recovery Facility	• Air quality and odour • Human health • Noise • Traffic • Visual • Social	• Air quality and odour • Human health • Traffic
Sydney International Speedway	• Traffic • Noise and vibration • Biodiversity • Aboriginal heritage • Air quality and odour	• Traffic • Noise

The potential cumulative impacts mainly relate to air quality and odour, noise, biodiversity and traffic impacts. These are assessed in more detail in **Table 23.3**.

Cumulative construction impacts

During construction, the proposal has the potential to cause cumulative impacts if other developments are built at the same time. Construction impacts which could result in cumulative impacts include noise, air quality and odour and transport, which may generate social impacts in terms of the change in amenity experienced by people living and working in the surrounding areas.

The construction timeframes for the surrounding developments are unknown. A worst-case scenario would be that all proposed development construction timeframes overlapped. While this is unlikely, it has been used as the basis for the assessment.

As construction impacts are temporary in nature and can be managed by applying standard construction environmental management measures, construction related impacts are not considered significant. The proximity of the site and the other developments to major transport infrastructure, including the Westlink M7 motorway, minimises construction traffic related impacts and the distance to residential areas minimises noise, air quality and other amenity impacts.

Cumulative operation impacts

Once the proposal is operational, it has the potential to cause cumulative impacts that relate to air quality and odour and consequently human health impacts, noise, traffic, waste, social and visual impacts. These cumulative impacts are inherently mitigated against in the embedded design of the proposal and by making sure the proposal operates in compliance with necessary licences and approvals.

Table 23.3: Potential cumulative impacts during construction and operation of the proposal

Impact	Assessment
Cumulative construction impacts	
Noise	WSERRC • The proposal's site location surrounded by industrial uses and major roadways and the distance to sensitive receivers mitigates its noise impact. The proposal construction noise and vibration impacts will be managed by a Construction Noise and Vibration Management Plan (CNVMP). Cumulative noise assessment • The likelihood of a cumulative construction noise impact is from the four projects to the south or west of the proposal area and the south west residential area (Horsley Park). It is likely that noise impacts at the residential area would be influenced by the closest project, with WSERRC being located furthest from this area. In addition, each project would manage construction noise impacts within their conditions of consent and in line with a construction noise management plan, which is the most effective way of avoiding and minimising cumulative impacts. • Even assuming a worst-case scenario of every project being constructed at the same, the noisiest activities are likely to occur for a short time within individual construction programmes.
Traffic	WSERRC • The traffic assessment (**Technical report K**) modelled the proposed construction traffic against the Gazcorp Industrial Estate proposed intersection upgrades at Wallgrove Road and Austral Bricks Road intersection (and their traffic load). The results showed that even with the proposal's construction traffic, the same level of service would be maintained for the intersection. All construction vehicles would be able to park onsite, avoiding offsite parking impacts on the road network. Cumulative traffic assessment • The Gazcorp Industrial Estate and Horsley Park Brickworks Plant 2 Upgrade have the potential for direct cumulative impacts as these projects will impact the same intersections as the proposal. Other projects are far enough away to avoid cumulative impacts. • The construction period for Horsley Park Brickworks Plant 2 Upgrade will be 2.5 years and could coincide with the WSERRC construction period. If there was overlap during construction periods, this could cause cumulative traffic impacts on the Austral Bricks Road and Wallgrove Road intersection. • A draft Construction Transport Management Plan (CTMP) has been prepared and would be updated by the appointed contractor. This will help manage and mitigate any construction traffic impacts and consider cumulative impacts if other projects are constructed at the same time. • Each major project would require a similar CTMP to be prepared and carried out during construction.

<table>
<tr><th>Impact</th><th>Assessment</th></tr>
<tr><td colspan="2">Cumulative construction impacts</td></tr>
<tr><td>Social</td><td>WSERRC
Potential negative social impacts during construction correlate to the anticipated visual, noise, air quality and traffic impacts. The social impacts are how these impacts are experienced and valued by people including their perceptions of impact. The proposal would also have the positive social impact of creating employment and business opportunities along the supply chain during construction.
Cumulative social assessment
Construction activities that overlap can exacerbate the potential effects of construction, for example increased construction noise and traffic volumes. This may intensify the potential social impacts associated with changes to movement and access and reduced amenity.
There is potential for construction fatigue to be experienced by nearby receivers where they are impacted by the proposal’s construction and other nearby construction activities.
The overlap of development can result in issues with sourcing construction workers, materials and equipment. However, as construction makes up a large proportion of the workforce (19%) and businesses (21%) in the local study area, this risk is low.
A Community management strategy will also be developed through the construction phase, which will include the formation of a Community Reference Group (CRG), contact protocols and communication strategy with nearby neighbours, residents and businesses.</td></tr>
<tr><td>Heritage</td><td>WSERRC
There are no known Aboriginal archaeological sites or areas of Aboriginal archaeological potential or non-Aboriginal heritage features within the proposal area, so the proposal is unlikely to impact on Aboriginal or non-Aboriginal heritage. An unexpected finds protocol will be followed during construction.
Cumulative heritage assessment
While other projects may result in heritage impacts, the proposal is unlikely to contribute to any cumulative heritage impacts.</td></tr>
</table>

<table>
<tr><th>Impact</th><th>Assessment</th></tr>
<tr><td colspan="2">Cumulative construction impacts</td></tr>
<tr><td>Biodiversity</td><td>WSERRC

The proposal will require the removal of 0.45ha of Cumberland Shale Plain Woodland. Site landscaping and restoration of cleared native vegetation communities, ecological communities and impacted aquatic habitats is proposed following construction of the facility to minimise impacts to biodiversity.

Cumulative biodiversity assessment

The surrounding projects will require the following vegetation removal:

The Next Generation proposal would require the removal of about 0.27ha Cumberland Plain Woodland and 2.89ha Eucalypt River flat forest. Offsetting will be achieved with about 0.54ha of Cumberland Plain Woodland and 4.98ha of River Flat Eucalypt Forest to be regenerated or replanted.
Horsley Park Brickworks Plant 2 Upgrade requires vegetation clearing including the loss of 0.11ha of degraded Cumberland Plain Woodland.
The Gazcorp Industrial Estate project will require the removal of Shale Hills Woodland, Shale Plain Woodland and Alluvial Woodland.
The Light Horse Interchange Business Hub project will require the removal of Cumberland Plain Woodland and Shale-Gravel Transition Forest.
The Roberts Road Data Centre project would require the removal of Red Gum Forest. Offsets are proposed to mitigate this impact.
The Western Sydney Green Gas project will have no impacts on biodiversity.
The Eastern Creek Resource Recovery Facility and the Sydney International Speedway are also likely to have biodiversity impacts, although the extent of these are not known as the EIS has not been prepared.

For projects that have been approved (Gazcorp Industrial Estate and Horsley Park Brickworks Plant 2 Upgrade) the total amount of Cumberland Shale Plain Woodland to be cleared would be 13.2ha. So, in combination with the WSERRC proposal's clearing of 0.45ha, the total Cumberland Shale Plains Woodland to be cleared would be about 13.6ha.
While there may be cumulative impacts of vegetation clearing, particularly for the Cumberland Shale Plain Woodland, all projects will mitigate these impacts by either replanting with native vegetation or offsets. For those projects not offering an offset, like the WSERRC proposal, the quantity of clearing and/or the quality of the vegetation being cleared must have been assessed to not be significant enough to require an offset (no or minimal impact).
</td></tr>
</table>

Impact	Assessment
Cumulative operation impacts	
Air quality and odour and human health	WSERRC • The proposal air quality impacts are assessed with and without the Next Generation proposal emissions considered (**Technical report A**). Without the Next Generation emissions, predicted incremental air quality impacts are low, with the maximum predicted air quality levels below the relevant criteria for all assessed air pollutants. Cumulative air quality and odour and human health assessment • The air quality assessment assessed a range of operational scenarios for WSERRC, and when including the Next Generation emissions into the background air quality levels, all predicated air quality impacts were within criteria. • The AQOIA also assessed potential cumulative impacts with other surrounding projects. The existing emissions from the operating Horsley Park Brickworks are accounted for in the WSERRC assessment modelling, so cumulative impacts are inherently already considered. Furthermore, the proposed Horsley Park Brickworks Plant 2 Upgrade EIS states that the upgrade will result in an improvement in the site's overall air quality. The Western Sydney Green Gas project will operate on natural gas for the first six months of operation, and the nitrogen oxides and fugitive natural gas emissions were predicted to be negligible. Once the proposal's generator is operated on hydrogen, the only emissions from the proposal will be oxygen, water and fugitive hydrogen. So, any cumulative air quality impacts associated with the Western Sydney Green Gas Project would be negligible. • It is likely that the Eastern Creek Resource Recovery Facility and the Sydney International Speedway proposals would also result in air quality impacts which could have a cumulative impact. The EIS's for these proposals have not yet been developed, so the potential cumulative impacts are unknown, however these proposals would also have to comply with requirements relating to air quality emissions. It is likely that any air quality impacts from the Sydney International Speedway would be localised to the speedway and immediate surrounding environment. Thus, these impacts are unlikely to cause cumulative impacts with the WSERRC proposal.
Noise	WSERRC • The noise assessment (**Chapter 13 Noise and vibration** and **Technical Report I**) concludes that noise generated from the operation of the proposal is predicted to comply with noise criteria at all sensitive receivers during standard weather conditions. In enhanced weather conditions where the noise is carried further, a minor exceedance (less than 2dB) during the night-time period is predicted at residential receivers located to the south of the site in Horsley Park. During the detailed design stage, the building envelope and plant and equipment would be designed so the proposal can comply with noise criteria.

Impact	Assessment
Cumulative operation impacts	
	Cumulative noise assessment • The noise assessment has been completed in line with the Noise Policy for Industry (NPfI) (EPA, 2017). This policy defines two noise levels, project intrusiveness noise levels and project amenity noise levels. The project intrusiveness noise level aims to protect against significant changes in noise levels, while the project amenity noise level seeks to protect against cumulative noise impacts from industry and maintain amenity for particular land uses. Applying the most stringent requirement as the project noise trigger level will make sure that both intrusive noise is limited, and amenity is protected and that no single industry can unacceptably change the noise level of an area (EPA, 2017). • Any future development in the local area would be subject to the same assessment process, thereby limiting the potential for cumulative noise from industrial activities over time. • The likelihood of a cumulative operational noise impact is from the nearest four projects to the south or west of the proposal area and the south west residential area. This has been considered through an assessment of the individual projects noise impacts and their stated noise impacts (if known).
Traffic	WSERRC • **Chapter 15 Traffic and transport** and **Technical report K** considered the trip generation from the proposal and the traffic impacts on the nearest intersections, being Wallgrove Road / Austral Bricks Road intersection and the Austral Bricks Road / site access intersection. The proposal will result in 236 two-way trips per day. The peak hour for vehicle trips would be between 09:00–10:00, with 33 vehicles arriving at the site. The traffic assessment (**Technical report K**) for this proposal uses the Gazcorp Industrial Estate proposed intersection upgrades in the modelling (including any the predicted traffic generated from the Gazcorp Industrial Estate project), the results indicate that although the proposal will increase the average intersection delay, the existing level of service is maintained for this intersection. Cumulative traffic assessment • Potential cumulative impacts associated with transport relate to increase traffic and congestion on surrounding roads being Austral Bricks Road and Wallgrove Road. • As the Gazcorp Industrial Estate traffic modelling has been included in the WSERRC assessment, the cumulative impacts have inherently been considered and the existing level of service is maintained for the Wallgrove Road / Austral Bricks Road intersection. • As the design of the intersection progresses, the applicant will continue to engage with Gazcorp and the approving authorities. This will make sure that the traffic generated by the proposal is considered and any design requirements are fed into the design process.

Impact	Assessment
Cumulative operation impacts	
	• For the Austral Bricks Road and site access intersection, the proposal will not change the level of service for this intersection, given the expected flows using the Austral Bricks Road. The nearest proposed development which could cause cumulative traffic impacts is the Horsley Park Brickworks Plant 2 Upgrade. The Horsley Park Brickworks Plant 2 Upgrade EIS concludes that the proposed development would not change the travel patterns of the existing site and would not increase traffic generation associated with the site. • For all other projects, they are located far enough away so that any cumulative impacts will be negligible.
Visual	WSERRC • Based on the assessment of landscape character and visual impacts (**Chapter 16 Landscape and visual** and **Technical report L**) the proposal will result in additional built form and large visual elements, such as the stack and plume which would result in a noticeable change for some visual receptors within the receiving environment. The visual impacts on the receivers are greater where the surrounding landscape has higher sensitivity, being within the Western Sydney Parklands and or rural residential areas. Cumulative visual assessment • The expansion of new industrial and commercial development to the area could result in the cumulative impact of overdevelopment or loss of existing landscape character. However, as the existing environment is zoned for industrial and commercial land uses intended for these proposed major developments, these types of activities could be reasonably anticipated. • The design embedded mitigation measures and careful architectural design of each development will mitigate cumulative visual impacts, as well as proposed landscaping and planting.
Waste feedstock	WSERRC • An assessment of the availability of waste feedstock in combination with the Next Generation facility has been considered and is discussed in **Chapter 2 Strategic context** and **Chapter 5 EfW policy**. Cumulative waste assessment • There is significantly more waste feedstock available in the Sydney Basin than the 500,000tpa design capacity of the WSERRC proposal. The Next Generation facility EIS states that it will process and thermally treat up to 552,000t of non-putrescible residual waste sourced from construction and demolition (C&D), commercial and industrial (C&I) sources as well as shredder floc. The proposed feedstock for the WSERRC facility differs from the Next Generation proposal in that it will thermally treat residual putrescible and non-putrescible waste from MSW and C&I sources. Even with increased source separation, reduction in waste generation per capita and meeting recycling targets, the Sydney Basin will still generate significant quantities of residual waste that will need to be managed.

Impact	Assessment
Cumulative operation impacts	
Social	WSERRC • Social impacts have been assessed for the proposal in **Chapter 17 Social** and **Technical report M**. Negative social impacts correlate to the anticipated visual, noise, and traffic impacts, as well as perceived social impact related to health impacts associated with air emissions. Potential employment and businesses opportunities for local and regional residents and businesses presents a positive social impact. • The proposal has strong environmental credentials and commitment to operating within the criteria stated in this EIS. The site has been chosen due to its distance from sensitive receivers, proximity to major transport corridors to avoid social impacts. Cumulative social assessment • The development of multiple similar projects in the surrounding area could compound social impacts. In particular, the combination of the proposal and the Eastern Creek Resource Recovery Facility may result in an increase of the perceived health and air quality impacts reported. In addition, the potential cumulative traffic and congestion impacts may also result in cumulative social impacts around way of life and ease of access to employment and services. There may be perceived social impacts associated with the core community value of liveability, noting a shift in the area towards more industrial use. However, industrial uses are specifically provided for in the broader policy framework and strategic direction for the area, and the proposal is part of the Western Sydney Parklands area which specifically allows for recycling and renewable energy activities. • Furthermore, the commitment to ongoing consultation with the community throughout the life of the facility will occur through the visitor and education centre, and creation of a Community Reference Group (CRG). The purpose of the CRG will be to help build long-term relationships with the community, enabling a forum for genuine discussion of construction and operation of the facility, community concerns, information requests, and local initiatives and partnerships. In addition to general CRG duties, it is anticipated that the CRG will also manage the allocation of the community funding package in line with an agreed governance framework. The CRG will be made up of community representatives, local stakeholders and council representatives, and meetings will be supported independently. It is likely that this group will be refreshed every 2 years so that a variety of community and other stakeholders are given the opportunity to participate (see **Chapter 6 Engagement**). These will help to mitigate cumulative social impacts.
Greenhouse gas	WSERRC • The WSERRC proposal will result in a net reduction of greenhouse gas emissions (390,000t of CO_2-e). Cumulative greenhouse gas assessment • Even if other projects do result in greenhouse gas impacts, the proposal will not contribute to negative cumulative impacts.

Chapter 24

Summary of management and mitigation measures

24 Summary of management and mitigation measures

Table 24.1 summarises mitigation and management measures recommended to minimise environmental impacts during detailed design, construction and operation of the proposal.

Inherent mitigation measures have been incorporated into the design as the proposal has been developed. These are discussed in detail in the impact assessment chapters of this EIS and the technical reports.

Table 24.1: Summary of recommended mitigation and management measures

ID	Mitigation measure	Timing
General		
GN1	A Construction Environment Management Plan (CEMP) will be prepared and carried out. The CEMP will contain the site-specific management and mitigation measures to be applied during construction, including timeframes and responsibilities.	Construction
GN2	An Operational Environment Management Plan (OEMP) will be prepared and carried out before operation of the proposal.	Operation
Air quality and odour		
AQ1	Overhead cranes are used to mix waste in the waste bunker, extract any obvious items that are out of specification, and load the process lines via the feed hopper into the boiler. The active mixing of the waste is designed to increase the waste homogeneity, which helps to minimise operation fluctuations and variation in emissions. The combustion system and boiler has been designed to operate at a range of operating conditions.	Design embedded
AQ2	The proposal flue gas treatment system will include: • A Selective Non-Catalytic Reduction (SNCR) with ammonia injection system for the removal of NOx • Combined dry/wet system comprising of bag filters, activated carbon injection and hydrated lime injection • Post-flue-gas polishing scrubber designed to allow emission limit values to be achieved under a range of operating scenarios. The proposed flue gas treatment system represents best practice and best available technology. WSERRC is the only proposed EfW facility in New South Wales for which an EIS has been lodged and that commits to a combination of dry/wet flue gas treatment technology.	Design embedded
AQ3	The boiler will include an advanced moving grate mass burn technology with the main combustion air supplied from below the moving grate, heated to a level designed to achieve complete combustion of feedstock. Movement of the grate floor components will also agitate the waste to optimise complete combustion.	Design embedded

ID	Mitigation measure	Timing
AQ4	Each grate line will be equipped with a Continuous Emissions Monitoring System (CEMS) (including redundant back up) to allow for continuous monitoring of the flue gas to make sure that the proposal is compliant with the licence limits. This also helps in giving real-time feedback to the control systems to make automatic adjustments to the combustion system and the injection rates for the flue gas cleaning system process.	Design embedded
AQ5	Construction dust will be managed through a Dust Management Plan integrated with the CEMP which will include water application for dust suppression, wheel washing of construction vehicles to prevent tracking of dirt/dust offsite and management of stockpiles to limit wind-blown dust.	Construction
AQ6	Construction particulates from diesel engines will be managed through measures in the CEMP which will include minimising engine idling and operating and maintaining equipment correctly.	Construction
AQ7	Waste will be transported to the facility in enclosed trucks and unloaded in the waste receiving hall which will be fully enclosed, with fast-acting roller shutter doors, operating under negative pressure to contain odours from the waste tipping process and the bunker. The air from the waste hall passes into the boiler and is destroyed in the combustion process.	Operation
AQ8	The waste bunker and tipping hall will also have an exhaust system equipped with an active carbon filter for odour control during standstill of the facility, to mitigate odour escaping from the waste bunker and tipping hall if the boilers are not operating.	Operation
AQ9	Hazardous waste is explicitly excluded from the incoming waste stream. The proposal has developed protocols to manage and mitigate any potential unacceptable waste, such as inspection regimes and scanning for radioactive materials.	Operation
AQ10	Waste will be transported to the facility in enclosed vehicles, which will minimise the potential for fugitive odour emissions.	Operation
AQ11	Before operations begin, a Proof of Performance trial will be carried out in line with an agreed plan, to test all major process components including emission controls and demonstrate compliance with approved criteria.	Operation
AQ12	All ash handling takes place inside the facility. Flue gas treatment residues (FGTr) are stored in sealed silos and transported in sealed trucks. Incinerator Bottom Ash (IBA) is quenched (wet) and stored in an enclosed bunker and building.	Operation
Waste management		
W1	Asbestos containing materials (ACM) and contaminated soil will be recognised and remediated in line with the Remediation Action Plan (RAP).FG	Construction
W2	Existing buildings and potentially contaminated soil within building footprints will be assessed and remediated in line with the RAP.	Construction
W3	Waste will be managed according to the waste hierarchy. The CEMP will include provisions for segregation and separate collection of recoverable materials including green waste, excavated natural materials and metals.	Construction

ID	Mitigation measure	Timing
W4	The CEMP will include measures for containment of waste during storage and transport, such as covering, fencing and bunding.	Construction
W5	A Weed Management Plan will be developed outlining appropriate control and disposal options of high-threat weeds found on site.	Construction
W6	The CEMP will include a requirement that all waste be delivered to an appropriately licensed facility for recovery or disposal.	Construction
W7	Waste will be managed according to the waste hierarchy. A Waste Management Plan (WMP) will be developed and will include provision for source separation systems for recyclable materials including food waste, paper and card and comingled recyclables. No operational waste will be disposed directly to the tipping hall for energy recovery.	Operation
W8	A WMP will be developed during detailed design to enable provision for storage and collection of waste.	Operation
W9	The WMP will include a requirement that all waste be delivered to an appropriately licensed facility for recovery or disposal.	Operation
Soils and water		
SW1	All waste storage and the waste bunker will be designed to avoid leaching of any contaminants into the groundwater or soils.	Design embedded
SW2	As part of the CEMP, an Erosion and Sediment Control Plan (ESCP) will be prepared and carried out, outlining measures for the prevention of erosion and sedimentation during construction.	Construction
SW3	Sediment basins in the ESCP would be designed to account for dispersive soils. Visual observation would be maintained during excavation for evidence of high salinity soils (visible salt crystals and other evidence), and if found, these would be removed and placed in covered stockpiles.	Construction
SW4	Where relevant, contaminated surface soils and fill material will be stripped, waste classified and disposed offsite at a licensed facility as per NSW EPA Waste Classification Guidelines.	Construction
SW5	Regular testing and characterisation of the ground in areas of potential disturbance would be carried out to quantify sulphides and the neutralisation necessary to mitigate the risk of acid sulfate soil production.	Construction
SW6	A draft Remediation Action Plan (RAP) has been prepared and will be carried out to make the site suitable for the proposal. The RAP will include: • Hazardous building materials survey • Removal of all hazardous building materials • A continued soil and soil gas monitoring.	Construction
SW7	Encountered groundwater will be monitored regularly throughout the construction period. Monitoring would assess any changes to background groundwater quality conditions from those previously recorded to recognise contaminant level trends and any groundwater impacts.	Construction
SW8	A surface water monitoring program will be applied to demonstrate the effectiveness of erosion control and sediment control measures and help with construction site management.	Construction
SW9	Given the proximity of the site to landfill, ongoing monitoring of groundwater quality will be carried out.	Operation

ID	Mitigation measure	Timing
Hydrology and flooding		
HF1	As part of a Soil and Water Management Plan (part of the CEMP) the contractor will be responsible for monitoring the quality of stormwater discharged from the site construction area via sedimentation basins. Ongoing monitoring of water quality in the overland flow path through the site, including at the site discharge point, will also be carried out throughout construction.	Construction
HF2	As part of a Soil and Water Management Plan (part of the CEMP), during the construction phase all works, or activities are to be carried out in line with Managing Urban Stormwater: Soils and Construction (The Blue Book).	Construction
HF3	As part of a Soil and Water Management Plan (part of the CEMP), a sediment control plan and strategy comprising of cut-off drains, shaker pads, check dams and sediment basins will be developed. This will improve the quality of stormwater runoff from the site and minimise downstream environmental impacts.	Construction
HF4	As part of the CEMP, a Dewatering Management Plan would be prepared before the decommissioning and dewatering of the farm dam. The Plan will describe the dewatering method, monitoring of water quality and measures to minimise risk to water quality in the overland flow path.	Construction
HF5	As part of the CEMP, arrangements will be developed for the reuse of stormwater collected in sediment basins for site activities such as dust suppression to minimise potable water demand for construction activities.	Construction
HF6	Locate site facilities and construction access tracks away from the existing overland flow path and recognised 1% AEP flood extent. This will assure a level of flood immunity to these facilities and minimise flood impacts on neighbouring properties. The construction site layout will be confirmed through the CEMP.	Construction
HF7	In line with Blacktown City Council water sensitive urban design (WSUD) principles and the stormwater pollutant reduction targets, water quality impacts associated with the proposal will be mitigated through: • The bioretention basin which will include a permanent pond depth and filtration media which will be planted with suitable nutrient-removing vegetation. It will also be installed with permanent water quality monitoring devices. • Site runoff through each trunk drain will pass through a gross pollutant trap before discharge to the basin. • Oil and water separators, including shut off valves.	Operation

ID	Mitigation measure	Timing
HF8	During site operations it is proposed to permanently monitor stormwater discharge at the outlet from the onsite detention (OSD) basin. As all site stormwater runoff from the development area will be directed to the basin, this will enable the quality of runoff from the site to be monitored effectively. The permanent testing will monitor a range of parameters representative of general water quality, including: • Dissolved oxygen (DO) • Turbidity • pH • Total suspended solids • Total nitrogen • Total phosphorus.	Operation
HF9	Stormwater runoff from the proposal site will be controlled by an OSD basin and the overland flow path will be realigned and revegetated to minimise offsite flooding impacts.	Operation
HF10	Runoff from sensitive areas with the potential to cause spills of chemicals or hydrocarbons will be contained by bunding and runoff will pass through oil and water separators.	Operation
HF11	Rainwater harvesting of main building roof runoff for reuse in the EfW plant process to reduce reliance on potable water.	Operation
Noise and vibration		
NV1	The building design mitigates noise impacts by being an almost fully enclosed building. Further opportunities will be recognised during the detailed design stage so that the proposal mitigates against any non-compliances with the noise criteria.	Design embedded
NV2	An assessment of natural frequencies of footings will be carried out so that resonant response does not occur during ramp-up, operation and ramp-down of the generator turbine. The building design will include piles where appropriate to reduce vibration impacts from the turbine and air-cooled condensers.	Design embedded
NV3	A detailed Construction Noise and Vibration Management Plan (CNVMP) will be prepared. This plan will include, but not be limited to the following: • Roles and responsibilities • Noise sensitive receiver locations • Noise mitigation strategy • Monitoring methods • Community engagement strategy.	Construction
NV4	Vibration monitoring will be carried out for works near the Warragamba Pipeline Corridor. This will include setting trigger levels and adapting the construction methods accordingly.	Construction
NV5	As part of the OEMP, specific noise management measures will be included so that the ongoing operation of the EfW facility adheres to noise criteria and avoids adverse noise impacts on sensitive receivers. A six-month post-commissioning report would be prepared as part of this OEMP.	Operation

ID	Mitigation measure	Timing
Hazard and risk		
HR1	The CEMP will include details of how to manage construction related risks including spills, incidents and transportation risks.	Construction
HR2	Install fire detection and suppression systems in both the tipping hall and waste bunker. The final waste bunker fire safety design shall be developed through an appropriate fire engineering process.	Operation
HR3	A facility wide vacuum cleaning system will be installed to reduce the likelihood of dust build-up in the tipping hall.	Operation
HR4	The ventilation of the Incinerator Bottom Ash (IBA) building will be sufficient to prevent the building up of hydrogen into an explosive atmosphere. The IBA area will also have hydrogen gas sensors with alarm set points below the lower flammability limit.	Operation
HR5	Acids and bases will be stored in line with AS 3780-2008, and in line with obligations under section 5 of Chapter 7 of the *Work Health and Safety Regulation 2011*.	Operation
HR6	Ammonium hydroxide and sodium hydroxide will not be stored in the same bunded area or in compounds that share a common drainage system as per section 6.3 of AS/NZS 3833-2017.	Operation
HR7	The activated carbon storage area will be zoned in line with AS/NZS 60079.10.2-2016 and a Hazard Assessment as outlined in section 3 of AS/NZS 4745-2012 will be carried out during the design phase.	Operation
HR8	The storage of diesel will be designed in line with EPA's Bunding and Spill Management guidelines and AS 1940-2017 and be contained within a bunded area that can hold the capacity of the diesel storage silo.	Operation
HR9	The ammonium hydroxide silos will be equipped with level sensors with real-time monitoring to detect leaks quickly from the control room.	Operation
HR10	Notification and evacuation procedures will be developed and included in an emergency plan as part of the OEMP, if there is a significant release of ammonium hydroxide.	Operation
HR11	The site managers will develop an emergency response plan which includes coordination with local response organisations such as Fire and Rescue NSW and NSW Ambulance services. The emergency response plan would include but not be limited to the following: • Emergency procedures • Evacuation procedures • Roles and responsibilities and contact details of emergency contacts • Equipment necessary to rectify the emergency • Details of hazardous materials stored onsite • Medical treatment advice.	Operation
HR12	The stack will be lit in line with Chapters 5 and 6 of the Federal Aviation Administration's (FAA) AC 70/7460-1L: Obstruction Marking and Lighting.	Operation
HR13	The proposal will be subject to an EPL and conditions of consent, that will further regulate the proposal to manage potentially hazardous or potentially offensive impacts.	Operation

ID	Mitigation measure	Timing
Traffic and transport		
TT1	The number of weighbridges and their location on the site is enough to avoid queuing onto the road network.	Design embedded
TT2	The site layout has been designed so that staff and visitor vehicles are separated from heavy vehicles.	Design embedded
TT3	The proposal includes end-of-trip facilities and bicycle parking to encourage sustainable transport to the site.	Design embedded
TT4	A Draft Construction Traffic Management Plan (CTMP) (Appendix A of **Technical report K**) has been prepared and includes measures to reduce construction traffic such as adjusting shift patterns, encouraging car sharing and making workers aware of other transport options. This CTMP, as part of the CEMP, will be updated once a contractor is appointed.	Construction
TT5	A Green Travel Plan will be prepared and carried out to inform employees on sustainable travel modes and will include measures to support these initiatives. A member of staff will be appointed as the Green Travel Plan coordinator tasked with applying and updating the plan.	Operation
TT6	The site will create designated car parking spaces for carshare use to encourage staff to carshare.	Operation
TT7	Most of the visitor travel to the visitor and education centre will be via coaches to minimise additional traffic generation.	Operation
Landscape and visual		
LV1	Integrating the design of the stack and blade wall to mitigate visual impact where possible, such as careful consideration of the choice of colour and material properties and/or introducing designed elements into the physical design of the stack.	Design embedded
LV2	Material selection will involve careful selection of colour and low-reflective material so the stack appears recessive above the skyline.	Design embedded
LV3	Incorporation of a green wall (vegetated system grown vertically) to the northern and southern extent of the building and a green roof to the Visitor and Education Centre. The Urban Green Cover in NSW Technical Guidelines (OEH, 2015) will be referred to during detailed design of the green walls and roof.	Design embedded
LV4	The architecture has been designed to reduce the building bulk and locate the greatest massing height in the centre of the built form to mitigate abrupt change in scale. Positioned the built form towards the south western boundary aligns with exiting local developments and is orientated on a north-south axis to align with the M7.	Design embedded
LV5	Limit lighting spill to the stack by careful placement of lighting columns. Lighting design would be designed to achieve a dim glow in localised areas such as the flue gas treatment hall. Any lighting treatments will not be directed at the building's facades.	Design embedded
LV6	Increase density of planting across the site which will help to screen ancillary infrastructure and enhance the landscape character within the proposal site.	Design embedded
LV7	Visual barriers around the site will be set up and maintained throughout the construction period to minimise visual impacts during construction.	Construction

ID	Mitigation measure	Timing
Social		
SO1	A targeted stakeholder and community engagement strategy and program will offer regular proposal updates, and liaison with sensitive receptors regarding impacts. A Community Reference Group (CRG) will be formed during construction and function across the life of the proposal. The purpose of the CRG will be to help long-term relationships with the community, providing a forum for genuine discussion of construction and operation of the facility, community concerns, information requests, and local initiatives and partnerships.	Construction
SO2	A construction skills and employment strategy will support employment of local people in construction and boost the construction business base in the local study area and wider region.	Construction
SO3	A targeted stakeholder and community engagement strategy and program including the CRG will educate the community on perceived impacts, offer information regarding the EfW process, handle and respond to complaints, and engage with vulnerable groups and sensitive receptors. The CRG will also manage the allocation of a community investment fund in line with an agreed governance framework. Funding contributions are yet to be determined but are likely to be towards initiatives such as local sporting infrastructure, community facilities and environmental areas such as tree plantings.	Operation
Greenhouse gas and energy efficiency		
GHG1	The proposal will use its own energy production to power the facility itself before exporting the remaining electricity generation to the grid.	Design embedded
GHG2	The plant is designed to run at 'high-steam conditions' which refer to the temperature and pressure of the steam that is generated by the boiler and is used to drive the turbine to generate electricity. High steam conditions maximise the recovery of energy from the flue gases, maximising energy efficiency.	Design embedded
GHG3	Variable Speed Drives (VSDs) will be specified for large motors driving fans and pumps to reduce energy consumption within the plant. This effectively decreases the electricity consumed by the plant, and therefore increases the amount of electricity that can be exported to the electricity grid in comparison to the case where single speed drives are used.	Design embedded
GHG4	All plant systems and equipment will be accurately specified and sized so they operate at optimal design point during normal operations. This means that equipment will operate efficiently, so energy efficiency of the overall facility will be increased.	Design embedded
GHG5	Use of energy-efficient motors.	Design embedded
GHG6	Use of mechanical/pneumatic rapping systems to do online cleaning to the boiler rather than soot blowers which would use steam which could otherwise been used for electricity generation.	Design embedded

ID	Mitigation measure	Timing
GHG7	Efficient design of steam turbine with multiple steam extraction points so that all internal process demands can be met with extracted steam for all load conditions.	Design embedded
GHG8	Maximizing natural ventilation of process plant areas where possible to minimize use of forced ventilation.	Design embedded
GHG9	Sub-metering of all electricity distribution at a system level to monitor usage and find out high consumers and opportunities for future improvement.	Design embedded
GHG10	Location of the Operations/Administration areas in the main facility, not a stand-alone building which reduces the overall volume of materials needed for construction.	Design embedded
GHG11	Consideration of the orientation of the buildings and glazed facades to limit excess solar gain thus reducing the need for excessive cooling. Use of glazing to balance solar gain with provision of natural light will also be carefully considered to reduce the energy usage from electrical lighting.	Design embedded
GHG12	Use of insulated façade materials to reduce energy consumption for heating and cooling when compared to a non-insulated facility.	Design embedded
GHG13	Materials will be carefully selected, considering life cycle impacts and embedded carbon in materials.	Design embedded
GHG14	The CEMP will include appropriate measures to be applied to optimise construction machinery and fuel usage, and the clearing of vegetation will be minimised as much as practical for the construction footprint.	Construction
GHG15	A site-specific Environmental Management Plan will be prepared and applied as part of the OEMP. This will outline energy-efficient procedures so the plant operation is optimised, including the logistics to reduce fuel usage. This plan will be continuously reviewed and audited.	Operation
GHG16	The OEMP will include measures so that Best Available Techniques (BAT) are reviewed, and so that opportunities are recognised and applied where future technologies may further reduce energy use.	Operation
GHG17	The operator will continue to investigate whether the installation of a heat / low-pressure steam offtake is possible, to allow the facility to operate in a Combined Heat and Power mode which would increase the overall energy efficiency of the facility. Such opportunities will be assessed periodically.	Operation
Heritage		
HE1	An Unexpected Find Procedure would be prepared and incorporated into the CEMP to manage finds if any Aboriginal or non-Aboriginal heritage is discovered during construction of the proposal.	Construction

ID	Mitigation measure	Timing
Utilities and services		
US1	The proposal avoids additional demand on the capacity of the electricity supply network by generating electricity and exporting it to the grid.	Design embedded
US2	In line with the Guidelines for Development Adjacent to the Upper Canal and Warragamba Pipelines, the proposal site layout has been configured such that the waste bunker (the deepest excavation of the proposal) is over 150m away from Pipeline Corridor, minimising the risk of vibration impacts on the pipelines.	Design embedded
US3	Generators may be used during construction to supplement the power offtake and commissioning activities.	Construction
US4	The timing for any connections/disconnections to existing services will be scheduled to avoid any peak periods and determined in consultation with the utility suppliers to avoid impacts to the existing live networks. Community engagement will be carried out as appropriate, to keep the community informed of works and potential service/supply disruptions which may affect them.	Construction
US5	Spare conduits that cross under the M7 will be used where possible to minimise excavations and mitigate disruptions.	Construction
US6	The works for private connections within the proposal site will coincide with bulk earthworks, reducing the amount of excavation and trenching needed. Spare conduits will be used for electrical and telecommunication networks which would allow laying new cables without additional earthworks.	Construction
US7	Any impacts from accidental spills or discharge of chemicals or hydrocarbons, such as fuels and oils in vehicles and/or equipment, will be managed by a Spill Management Plan.	Construction
US8	Erosion of soil and sedimentation through stormwater runoff and as result of earthworks and potential vegetation removal will be managed through erosion and sediment control measures to avoid any potential impact to the Warragamba Pipelines.	Construction
US9	The generation of electricity by the EfW facility has the potential to cause corrosion of the pipelines by low frequency induction. The proposed HV cables will be buried underground, in line with Service and Installation Rules of NSW and Endeavour Energy requirements. The cable routes will be positioned at a minimum of 20m from the pipeline corridor to reduce potential corrosion of the Warragamba Pipelines.	Construction

ID	Mitigation measure	Timing
US10	Low vibration generating items of excavation plant and equipment will be placed on the southern part of the site. To minimise risks posed by vibration, driven piles will be prohibited, with bored or augured piles used instead. Attended vibration monitoring will be conducted at the beginning of any vibration generating activities to confirm minimum working distances and to limit vibration transmission through the ground. Additional agreed mitigation measures during construction will include setting up a monitoring regime of the pipe protection during the construction of the proposed works and managing traffic flows over the access road so that WaterNSW retains access to the pipeline corridor and allow activities that maintain the function of this critical asset.	Construction
US11	Demolition work is to be carried out in line with Australian Standard AS 2601-2001: The demolition of structures to avoid impacts on existing infrastructure.	Construction
US12	A Dial Before You Dig (DBYD) 1100 service in line with the requirements of the *Electricity Supply Act 1995 (NSW)* will be carried out before starting underground activity.	Construction
US13	Fire and water tanks are proposed to lower the peak water demand on Sydney Water's potable water network.	Operation
US14	Several vibration generating items will be installed on site such as the turbine and the Air-Cooled Condenser (ACC). The turbine hall is located over 100m and the ACC 60m from the southern boundary of the proposal site. Items that generate vibration have been located about 50m away from the pipeline corridor. The turbine, which creates the most vibration, is located about 100m from the pipeline corridor and will be founded on a piled raft which will incorporate a spring damper system to reduce the vibration effect of the equipment.	Operation
US15	Most hazardous materials are being stored within the EfW building and are clear of the pipeline corridor. The materials stored are well understood and specific guidance is available for the appropriate protection of these chemicals from sources such as Australian Standards. Items stored externally will be bunded and secured in line with Australian Standards to mitigate any potential risks to the Warragamba Pipelines.	Operation
Biodiversity		
BD1	The size and layout of the proposal has been consolidated to minimise disturbance of existing biodiversity values.	Design embedded
BD2	A Flora and Fauna Management Plan would be prepared and carried out. The Flora and Fauna Management Plan would include appropriate controls to manage biodiversity during construction and avoid impacts on biodiversity values.	Construction
BD3	As part of the CEMP, an unexpected finds procedure would be prepared and applied to describe the process for detecting, dealing with, and managing any unexpected threatened flora or fauna.	Construction
BD4	Noise activities such as piling, and rock hammering should be limited to daytime hours for the duration of the construction period. These measures will be included in the Construction Noise and Vibration Management Plan.	Construction

ID	Mitigation measure	Timing
BD5	A Waste Management Plan would be prepared as part of the CEMP to manage waste during construction and would include measures to avoid impacts on biodiversity.	Construction
BD6	A Dewatering Management Plan would be prepared as part of the CEMP outlining strategies for the use of the water within the dam, controls for reducing contamination risk in the form of suspended solids impacting on the receiving environment and completing an aquatic fauna/fish salvage.	Construction
BD7	A Vegetation Management Plan (VMP) will be prepared, carried out and audited as a part of the CEMP and will outline proposed measures for the restoration of native vegetation, ecological communities and associated habitats within the development site. The plan will be generally in line with the Vegetation Management Plan (Appendix A of **Technical report Q BDAR**). Site landscaping and habitat restoration will include restoration of the riparian corridor, 0.6ha of plantings including trees, shrubs and grasses generally representative of a Cumberland Shale Woodland ecological community. The VMP will include any measures for ongoing management and monitoring of restoration outcomes.	Construction
BD8	Vegetation proposed as part of the VMP will consider the location of infrastructure and selection of species to avoid impacts on infrastructure.	Construction
BD9	Management measures would be prepared, applied and audited to avoid and minimise the environmental risks associated with weeds, pests and pathogen. A Weed Management Plan would be incorporated as part of the VMP.	Construction
BD10	Lighting impacts are to be minimised as much as possible using sensor lighting and/or directional lighting for more heavily used parts of the facility.	Construction
BD11	Operations will be contained within developed areas of the site, with permanent fencing, buffer plantings and batters delineating the extent of these areas from other vegetated parts of the site.	Operation

Chapter 25

Evaluation and conclusions

25 Evaluation and conclusions

This chapter covers an overall evaluation of the proposal, taking into consideration:

- The need for the proposal based on its contribution to meeting government objectives for waste management by managing residual waste that would otherwise go to landfill, resulting in recovery of energy and avoidance of landfill environmental impacts
- The approach to avoiding and minimising environmental impacts, including those acknowledged as being of concern to the community, stakeholders and government agencies
- The objects of the *Environmental Planning and Assessment Act 1979*.

25.1 Proposal need and benefits

25.1.1 Need

The NSW Waste Avoidance and Resource Recovery Strategy 2014–2021 is a state-wide waste strategy detailed by the *Waste Avoidance and Resource Recovery Act 2001*. The main goal of the Strategy is to *'enable all of the NSW community to improve environment and community well-being by reducing the environmental impact of waste and using resources more efficiently'*.

The Strategy sets a target to increase waste diversion from landfill to 75% and to increase recycling of MSW and C&I waste to 70% by 2021–22. It notes that reuse and recycling remain the main avenues for diverting waste from landfill, supplemented by energy recovery. Actual recycling rates for MSW in the Sydney Metropolitan Levy Area (MLA) are currently short of this target, declining from 52% in 2010 to 2011 to 42% in 2017 to 2018, with recycling rates for C&I waste declining from 57% to 53% over the same period.

To achieve the landfill diversion targets through increased recycling, New South Wales needs greater source separation of waste to create clean streams of material with reduced contamination. Complementary investment in secondary resources processing infrastructure is also necessary to produce materials of value supported by meaningful market opportunities. Without source separation, the contamination of waste streams means it is not technically and economically viable to separate out waste for recycling or generate outputs of genuine value and need.

Even with higher recycling rates, a solution for residual waste is still needed. Experience from Europe indicates some countries are achieving genuine recycling rates of up to 66% and near 100% diversion from landfill.

However, achieving these landfill diversion rates calls for thermal treatment of the residual waste that cannot otherwise be recycled within existing technical, market and financial constraints.

As circular economy principles influence the design of materials, allowing them to be shared, reused and repaired, the amount of waste generated will be reduced. At the same time, increased management of waste over its life cycle will increase the availability of waste to be reused and recycled.

In recognition that energy recovery of waste is preferable to landfill, and as jurisdictions such as New South Wales transition towards circular economy principles over time, EfW facilities like WSERRC will play an important role in diverting waste from landfill during that transition. Even as recycling increases in response to the implementation of circular economy principles, EfW will be necessary to manage the residual waste that remains, to meet the diversion from landfill goals.

The proposal has been sized to offer a viable residual waste management infrastructure solution without the need to attract or cannibalise waste that can be effectively and economically reused, repaired or recycled.

25.1.2 Benefits

By diverting waste from landfill, EfW facilities like WSERRC:

- Recover some value from the waste as energy
- Significantly reduce the volume of residual waste for final disposal
- Decrease net GHG emissions
- Use less land
- Reduce the legacy impacts of landfills, such as soil and water contamination from leachate, as well as odour impacts.

In recognition of the ongoing requirement to dispose of non-recyclable waste to landfill, EfW allows the opportunity to preserve valuable landfill airspace, which is declining in Sydney, with limited land available for expansion of existing or development of new landfills.

As well as diverting waste from landfill, the proposal will enhance energy security for New South Wales by supplying a base load energy source, part of which is categorised as renewable, and an alternative to traditional fossil fuel generation. The proposal will produce enough energy for over 79,000 homes in Western Sydney, reducing net greenhouse gas emissions by around 390,000t of CO_2-e per year, equivalent to taking about 85,000 cars off the road each year.

In addition to supplying electricity to the grid, there is also potential to supply energy in the form of heat and steam to local industrial users.

It is the intention of the proposal to build and maintain a strong relationship with the community, continuing the momentum achieved with the engagement activities to date. The main part of this relationship is the onsite visitor and education centre, which will be available as an educational resource to the local and wider community. It will focus on the principles of waste management, waste avoidance, the circular economy, recycling, resource recovery and EfW.

The proposal will also benefit the local economy, representing a major investment in Western Sydney of about $645m, creating around 900 direct and 700–1200 indirect construction jobs over the 3-year construction period and 50 highly skilled jobs locally during operation.

25.2 Avoidance and minimisation of impacts

The avoidance and minimisation of environmental impacts has been central in the selection of the site, the choice of process technology and the layout and design of the facility.

25.2.1 Site selection

A site screening analysis was carried out between July 2018 and October 2019. Decisive factors in selecting an EfW site include proximity to waste sources, separation distances to existing and future residential areas, access to transport and power infrastructure and compatibility with surrounding land uses.

The site is in a region that is expected to accommodate most of the population growth forecast for Sydney, motivated in part by the development opportunities created by the Western Sydney Airport and Western Sydney Aerotropolis.

The location of the site in this growth region and close to installed waste management infrastructure under the ownership of the applicant such as the Erskine Park Waste Transfer Station minimises the transport distances between the sources of waste, waste processing facilities and the proposal.

The location of the site also avoids unacceptable impacts on the protected airspace of the Western Sydney Airport.

The proposal site is located around 1km from the nearest residential areas. The risk of future encroachment is reduced by its location in the Western Sydney Parklands and next to the Western Sydney Employment Area, both of which prohibit residential development.

The site is directly next to the M7 and close to power supply infrastructure and it is in an area that has and continues to be used for waste management facilities.

It is consistent with the Wallgrove Precinct Plan, part of the Western Sydney Plan of Management, which recognises recycling and renewable energy as future land use opportunities in the Precinct.

Based on the above, it is considered that the site is well suited for the proposed development.

25.2.2 Technology selection

The selection of the EfW process technology is also a main consideration in enabling the proposal to operate safely and within stringent environmental standards. Moving grate was chosen as the combustion technology, given that it is the most reputable and proven technology used globally and has been continually improved, responding to regulatory, industry and public demands.

The proposal has been designed to align to the European Industrial Emissions Directive (IED) and the associated Best Available Techniques Reference (BREF) document which sets the European Union environmental standards for waste incineration as published on 3 December 2019. The EU Commission Implementing Decision (2019/2010) on the 12 November 2019 classifies the best available techniques (BAT) as the main element of the BREF and prescribes them to be adopted by Member States. Additionally, the facility will comply with the technical criteria set out in the NSW EfW policy.

A main part of the process is the flue gas treatment technology. A semi-dry system with additional wet scrubber was chosen as the preferred approach for flue gas treatment as it readily achieves both the EU and NSW technical and environmental criteria, and because of its ability to future proof against potential tightening of emission limit values, its efficient water use and avoiding the need to treat wastewater.

Selective Non-Catalytic Reduction (SNCR) was chosen as the preferred technology to reduce oxides of nitrogen (NO_x) as it achieves the BREF limits for NO_x, is reliable and efficient to operate and achieves a high level of energy efficiency.

WSERRC is the only proposed energy from waste facility in New South Wales for which an EIS has been lodged, that commits to a combination of dry/wet flue gas treatment technology.

The reference facilities for the proposal – Dublin (Ireland) Waste to Energy and Filborna (Sweden) Waste to Energy – use similar waste streams and the same technology, including combustion, flue gas treatment and NO_x reduction. This gives confidence that the proposal can be operated to the same levels of environmental performance as the reference facilities and meet the requirements of the NSW EfW policy Statement.

25.2.3 Site layout and design

The design of the facility has evolved through several iterations, responding to an objective to integrate the built form into the existing local context by mitigating the visual bulk of the building.

The layered blades approach uses a series of vertical blade walls which incrementally rise up from the landscape, the tallest section being in the centre of the building. The use of the 'blades' interrupts the large façades, so they are more visually interesting and less bulky, as well as breaking up the mass from main viewing corridors on the M7 in the north and south directions. To further soften the building's appearance from the road and connect it to the landscape, the northern and southern ends of the building will be covered in living green walls, as will the roof of the visitor and education centre. The design tightly wraps the building, eliminating any wasted space. Once the building is subdivided in this manner, the facades in between the blades will be clad in materials to further break up mass.

The site layout and design also considered alternative heights and locations for the stack. The final location in the south of the site was selected because of the slightly higher elevation, facilitating the stack on a higher part of the site and improving overall emissions dispersion as a result.

The stack is designed as a stand-alone stack, centred to the southern end of the main building axis with a low-level architectural treatment. The central location of the stack is in line with the built form, so when viewed from the main viewing corridor along the M7, the stack is largely obscured to south bound motorists and cyclists. For northbound traffic, the lower portion of the stack is set against the silhouette of the main building (noting that the sun path is to the north, so the southern face of the stack is typically in shadow). The addition of a large green wall at the southern end of the building also conceals the lower portion of the stack and associated tanks at ground level.

25.2.4 Impact assessment

The outcome of the impact assessment is that the proposal can be built and operated in a way that avoids and minimises environmental impacts to meet relevant impact assessment criteria, reflecting the crucial decisions taken during site selection, technology selection and site layout and design of the proposal.

For air quality, assessment is carried out against a combination of NSW and European standards, with the latter based on the EU Industrial Emissions Directive Best Available Technology (BAT) Reference document (BREF) 2019, which is generally considered more stringent than NSW standards.

The air quality assessment concluded that emissions from the proposal are within all applicable standards. As the human health risk assessment is largely based on the air quality assessment, human health risks have also been assessed as being within applicable standards.

25.3 Engagement

Engagement activities carried out to date have discovered a range of issues of interest to the community, stakeholders and government agencies, which have been discussed in the EIS.

The significant issues of interest to the community are the air quality and human health impacts of the proposal, with requests for additional information on these issues known early in the engagement process.

In response, an Air and Health Citizens Panel was set up, with four sessions held during the preparation of the EIS. The sessions allowed a detailed explanation of the approach to the air and health assessments to be provided with an opportunity for the community to seek clarifications from the relevant technical experts.

Engagement will continue following EIS lodgement and through the building and operation of the proposal with the creation of a Community Reference Group (CRG). The CRG will also manage the allocation of the community funding package in line with an agreed governance framework.

The applicant has included in the EIS an offer and draft terms for a Voluntary Planning Agreement (VPA) to be entered into with Blacktown City Council (BCC) under clause 7.4 of the *Environment Planning and Assessment Act 1979*.

Should BCC wish to accept the offer for a VPA, the VPA would be publicly exhibited for 28 days, in line with the *Environment Planning and Assessment Act 1979,* before determination of the Proposal.

25.4 Objectives of the EP&A Act

An assessment of how the proposal meets the objectives of the Act is included in **Table 25.1.**

Table 25.1: Objectives of the EP&A Act

Objective	Response
(a) to promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the state's natural and other resources	The proposal will manage resources by recovering valuable resources from residual waste that would otherwise go to landfill, supplying a source of baseload energy, part of which is renewable, and reducing environmental impacts associated with landfill. The proposal is consistent with the principal aim of the WARR Strategy '*to enable all of the NSW community to improve environment and community well-being by reducing the environmental impact of waste and using resources more efficiently'*. The proposal applies combustion and flue gas treatment techniques which are known as Best Available Techniques in the EUs BREF document. These techniques avoid and minimise impacts on the community and environment from the operation of the proposal. In addition, the visitor and education centre will offer a valuable resource to help in raising awareness about the need to manage waste as a resource.
(b) to allow ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment	An assessment of the proposal against ecologically sustainable development principles, as defined in section 6 of the *Protection of the Environment Administration Act 1991* can be found in **Section 25.3** below.
(c) to promote the orderly and economic use and development of land	The proposal is suitable for the site as it is located in area which has been and continues to be used for waste management infrastructure, is buffered from residential areas and has easy access to supporting infrastructure, such as transport and power supply. The proposal is consistent with the Western Sydney Parklands Plan of Management because it is using land of low environmental or recreational value for services infrastructure and offering employment. The desired future character for the Wallgrove Precinct includes retention of some current uses (such as recycling sites) and future uses (such as recycling and renewable energy). The WSERRC incorporates both recycling and renewable energy and would be consistent with the desired future character of the Precinct.
(d) to promote the delivery and maintenance of affordable housing	Not applicable.

Objective	Response
(e) to protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats	The design has sought to protect existing vegetation as much as possible and integrate it into the overall site layout and landscaping strategy with the aim of enhancing the visual appearance and biodiversity values of the site. Revegetation works will rebuild native vegetation communities, such as the Cumberland Shale Palins Woodland, and restore the ecological functions of overland flow path which drains into Reedy Creek and Eastern Creek known as main fish habitat.
(f) to promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage)	The Aboriginal cultural heritage assessment included a review of existing archaeological investigations, Aboriginal community consultation and assessing the cultural significance of Aboriginal heritage for the proposal. The assessment concludes that there are no Aboriginal archaeological sites within the proposal area due to high levels of previous disturbance, and the potential for areas of Aboriginal archaeological heritage is very low.
(g) to promote good design and amenity of the built environment	The approach to the architectural and landscape design is motivated by the concept of integrating the proposed facility thoughtfully into the local and district-wide context. Design measures have been adopted to mitigate the visual bulk of the building and focus on the human experience for passers-by, employees and visitors.
(h) to promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants	The buildings will be designed and constructed to comply with the Building Code of Australia (BCA) which sets the minimum necessary requirements for safety, health, amenity and sustainability in the design and construction of new buildings throughout Australia.
(i) to promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the state	The proposal has consulted with state and local government authorities and agencies to canvas a wide range of viewpoints which have been considered in the environmental planning and assessment of the proposal.
(j) to create increased opportunity for community participation in environmental planning and assessment.	Community engagement began in the early stages of proposal planning, has continued throughout the development of this EIS and will continue following lodgement of the EIS. The community and stakeholder engagement strategy was developed through early community research, to understand the issues, ideas, and sentiment relevant to the community. This early research asked the community how they wanted to be engaged during the EIS, and the findings from this research informed the approach to community engagement. The involvement of the community in the building and operational stages of the proposal will be formalised through the creation of a Community Reference Group.

25.5 Ecologically sustainable development

Ecologically sustainable development, or ESD, is defined in the *Protection of the Environment Administration Act 1991* as follows:

'For the purposes of subsection (1) (a), ecologically sustainable development requires the effective integration of social, economic and environmental considerations in decision-making processes. Ecologically sustainable development can be achieved through the implementation of the following principles and programs:

(a) the precautionary principle—namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

In the application of the precautionary principle, public and private decisions should be guided by:

(i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and

(ii) an assessment of the risk-weighted consequences of various options,

(b) inter-generational equity—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,

(c) conservation of biological diversity and ecological integrity—namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration,

(d) improved valuation, pricing and incentive mechanisms—namely, that environmental factors should be included in the valuation of assets and services, such as:

(i) polluter pays—that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,

(ii) 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,

(iii) 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.'

25.5.1 The precautionary principle

The process of deciding on the scope of assessment to be included in the EIS adopted a precautionary risk-based approach by treating those issues for which the risk was unknown or uncertain at that time as significant issues needing further detailed assessment.

This informed the scope of further investigations. For example, a contamination site investigation was carried out to give greater certainty regarding the potential for contamination onsite, with the outcomes of the assessment recognising the need to develop and apply a Remediation Action Plan (RAP).

While the proposal is introducing new technology to New South Wales, it is a reputable and proven approach to waste management in other jurisdictions. The specific technologies chosen, such as the moving grate and flue gas treatment systems, were chosen because of their long track record of reliable performance treating similar waste streams to those that will be used at the proposal.

Reference facilities using similar waste streams and the same technology, including combustion and flue gas treatment, were recognised. Emissions data from one of these facilities was used to input to the air quality assessment for the proposal, demonstrating that the proposal can operate to stringent environmental performance standards and reducing the risks associated with the introduction of a new technology to New South Wales.

25.5.2 Intergenerational equity

The overall aim of the proposal is to reduce the amount of waste which would otherwise be sent to landfill, reducing the long-term environmental impacts associated with landfilling, while producing a baseload energy supply, part of which is categorised as renewable.

By contributing to two of the main environmental challenges faced in New South Wales and other jurisdictions – managing the environmental impact of waste and supplying alternative sources of energy – and by applying best available techniques for the operation of the facility and for the control of air emissions, the proposal makes a positive contribution to the health, diversity and productivity of the environment for future generations.

25.5.3 Conservation of biological diversity and ecological integrity

The site is located in the western part of the Western Sydney Parklands and is largely cleared as a result of previous development. The proposal will involve some clearing of vegetation around the eastern boundary of the site. However, this has been minimised through the site layout.

Site landscaping and restoration of cleared native vegetation communities, ecological communities and impacted aquatic habitats is proposed following building of the facility, to minimise impacts to biodiversity.

The proposal will restore the overland flow path on the eastern boundary, including replanting with native species. This which will contribute to an improvement in water quality flowing to Eastern Creek and Reedy Creek, recognised as fish habitat. The addition of onsite detention and bioretention basins will also contribute to improvements in water quality compared to the existing informal drainage arrangements onsite.

25.5.4 Improved valuation, pricing and incentive mechanisms

The proposal adopts the polluter pays principle by incorporating combustion and flue gas treatment technology in the design of the proposal, representing a significant part of the overall cost of the proposal. In addition, the proposal will operate within the waste management levy framework set up by *Protection of the Environment Operations Act 1997* which obliges certain licensed waste facilities in New South Wales to pay a contribution for each tonne of waste received at the facility. The waste levy aims to reduce the amount of waste being landfilled and promote recycling and resource recovery.

The proposal aligns to the environmental goals of the WARR Strategy to increase recycling and the amount of waste diverted from landfill. While using a technology well-known overseas, when seen in the NSW context, the proposal represents an innovative and market-led response to the WARR Strategy goals.

25.6 Conclusions

Through the EIS, the proposal has demonstrated that it is a proven approach to solve the need to increase the amount of waste diverted from landfill.

Acknowledging that recycling rates need to increase in New South Wales, there will be an ongoing requirement to manage residual waste. The proposal creates an opportunity to increase the amount of waste diverted from landfill and supports increasing recycling rates through recovery of metals and ash, while New South Wales transitions towards greater source separation of waste, and changes how products are designed materialise.

The proposal has been sized to allow a viable residual waste management infrastructure solution, while not needing to attract or cannibalise waste that could be effectively and economically reused, repaired or recycled.

The EIS demonstrates that the proposal can operate within stringent environmental performance standards, including for air quality and human health, through applying the best available techniques as defined in the EU BREF 2019.

The proposal will also generate a source of baseload energy, part of which is categorised as renewable, and will supply heat and steam to local industrial users.

The proposal acknowledges that while EfW is a reputable and proven approach to waste management in other jurisdictions, it is a relatively new technology for New South Wales, and that the community has concerns about air quality and human health.

In response, an Air and Health Citizens Panel was created to enable a forum for a detailed discussion between relevant technical experts and community representatives. The proposal is committed to continuing its engagement with the community following lodgement of the EIS and through the building and operational phases.

Chapter 26

References

26 References

Australia International Council on Monuments and Sites, 1999. *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance 1999.*

Australian Bureau of Statistics, 2016. *ABS Census 2016.*

Australian Energy Market Operator, 2018. *Integrated System Plan.*

Australian Government Department of the Environment, 2013. *Matters of National Environmental Significance, Significant Impact Guidelines 1.1: Environment Protection and Biodiversity Conservation Act 1999.*

Australian Government, 1981. *Environmental Protection (Sea Dumping Act) 1981*

Australian Government, 1983. *Protection of the Sea (Prevention of Pollution from Ships) Act 1983.*

Australian Government, 1992. *Australian National Strategy for Ecologically Sustainable Development.*

Australian Government, 1992. *Disability Discrimination Act 1992.*

Australian Government, 1999. *Environmental Protection and Biodiversity Act 1999.*

Australian Government, 2000. *Environmental Protection and Biodiversity Regulation 2000.*

Australian Government, 2006. *Protection of the Sea (Harmful Anti-Fouling Systems) Act 2006.*

Australian Government, 2012. *Navigation Act 2012*

Australian Government, 2013. *Actions on, or Impacting upon, Commonwealth Land, and Actions by Commonwealth Agencies, Significant Impact Guidelines 1.2, Environment Protection and Biodiversity Conservation Act 1999.*

Australian Government, 2013. *Matters of National Environmental Significance, Significant Impact Guidelines 1.1, Environment Protection and Biodiversity Conservation Act 1999.*

Australian Government, 2017. *Commonwealth Renewable Energy (Electricity) Act 2001.*

Australian Government, 2018. *Commonwealth Renewable Energy Target Scheme.*

Australian Government, 2019. *National Greenhouse and Energy Reporting Act 2007.*

Australian Government, 2019. *The Native Title Act 1993.*

Australian Standards, 1993. *AS1940, B1993: The Storage and Handling of Flammable and Combustible Liquids.*

Australian Standards, 1997. *AS4452: The Storage and Handling of Toxic Substances the Dangerous Goods Act 1975.*

Australian Standards, 2008. *AS 3780-2008: The storage and handling of corrosive substances (published 2008).*

Australian Standards, 2012. *AS/NZS 4745-2012: Code of practice for handling combustible dusts (published 2012).*

Australian Standards, 2016. *AS/NZS 60079.10.2-2016: Explosive atmospheres Classification of areas – Explosive dust atmospheres (published 2016).*

Australian Standards, 2017. *AS 1940-2017: The storage and handling of flammable and combustible liquids (published 2017)*

Babcock & Wilcox Volund, 2018. *Filbornaverket Waste to Energy Plant: Project Case History*, Available at: https://www.babcock.com/-/media/documents/case-profiles/renewables/filborna---helsingborg---sweden.ashx

Bioenergy Australia, 2019. *Energy from Waste: Thermal Treatment Fact Sheet, Waste Management & Resource Recovery Association Australia, Vol. 1.*

Blacktown City Council, 2015. *Blacktown City Council Development Control Plan.*

Blacktown City Council, 2017. *Our Blacktown 2036 Our vision, our plan – Community strategic plan.*

Blacktown City Council, 2019. *Draft local strategic planning Statement 2019.*

British Standard Institution, 1992. *British Standard BS 6472-1992: Evaluation of human exposure to vibration in buildings (1-80Hz).*

British Standard Institution, 1993. *British Standard BS 7385-2: 1993 Evaluation and measurement for vibration in buildings – Pt 2: Guide to damage levels from groundborne vibration.*

Canadian Environmental Assessment Agency, 1999. *Cumulative Effects Assessment Practitioner's Guide*

Cosolo, K., 2018. *How Methane Gas Causes Climate Change and What To Do About It, The Global Climate.*

Covanta, 2019. *Dublin WtE Quarterly Environmental Report Q1 2019.*

Covanta, 2019. *Dublin WtE Quarterly Environmental Report Q2 2019.*

Covanta, 2019. *Dublin WtE Quarterly Environmental Report Q3 2019.*

Covanta, 2020. *Dublin Waste to Energy Emissions Data – IED Weekly Emissions Data.* Available at: https://www.dublinwastetoenergy.ie/About-the-Facility/Emissions-Data/

Covanta, 2020. *Dublin Waste to Energy Emissions Data – Stack Test Results.* Available at: https://www.dublinwastetoenergy.ie/About-the-Facility/Emissions-Data/

Department of Infrastructure, Transport, Regional Development and Communications, 2018. *Guideline C: Managing the Risk of Wildlife Strikes in the Vicinity of Airports. National Airports Safeguarding Framework Principles and Guidelines.*

Department of Planning and Infrastructure, 2011. *Multi-level Risk Assessment, Assessment Guideline.*

Department of Planning, 2011. *Applying SEPP 33 – Hazardous and Offensive Development Application Guidelines (Applying SEPP 33).*

Department of Planning, 2011. *Hazardous Industry Planning Advisory Paper No. 4, Risk Criteria for Land Use Safety Planning.*

Department of Planning, 2011. *Hazardous Industry Planning Advisory Paper No. 6, Hazard Analysis.*

Deutsches Institut fur Normung, 1999. *DIN 4150-3 (1999) Structural vibration - Effects of vibration on structures, Deutsches Institut fur Normung.*

Dublin Waste to Energy, 2006. *Environmental Impact Statement – non-technical summary*. Environmental Protection Agency Ireland

Dublin Waste to Energy, 2006. *Waste application form attachment D2 – facility operations*. Environmental Protection Agency Ireland.

Dublin Waste to Energy, 2006. *Waste application form attachment G.2 Energy Efficiency*, Environmental Protection Agency Ireland.

Dublin Waste to Energy, 2017. *Annual Environmental Report for Dublin Waste to Energy Ltd. for 2017*. Environmental Protection Agency Ireland.

Dublin Waste to Energy, 2019. *Annual environmental report for Dublin Waste to Energy for 2018*. Environmental Protection Agency Ireland.

Energy Recovery Council, 2014. *USA Energy Recovery Council.*

enHealth, 2012. *Australian Exposure Factors Guide.*

enHealth, 2012. *Environmental Health Risk Assessment Guidelines for Assessing Human Health Risks from Environmental Hazards.*

Environmental Protection Agency Ireland, 2018. *Household Waste Characterisation Campaign: Final Report*. Available at: https://www.epa.ie/pubs/reports/waste/wastecharacterisation/Household_Surveys_Final_Report1.pdf

Environmental Protection Agency Ireland, 2018. *Waste licence for a non-hazardous waste incinerator / waste-to-energy facility W0232-01.*

Environmental Protection Agency Ireland, 2018. *Non-household Waste Characterisation Campaign*. Available at: http://www.epa.ie/pubs/reports/waste/wastecharacterisation/Final_Report_NHWC.pdf

Environmental Protection Agency Ireland, 2019. *Technical Amendment C to Industrial Emissions Licence W0232-01*

European Commission, 1999. *Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions*

European Commission, 2019. *Best Available Techniques (BAT) Reference Document for Waste Incineration*, Available at: https://eippcb.jrc.ec.europa.eu/sites/default/files/2020-01/JRC118637_WI_Bref_2019_published_0.pdf

European Parliament, 2010. *Directive 2010/75/EU of the European Parliament and of the Council – Industrial Emissions*, Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32010L0075&from=EN

Fairfield City Council, 2016. *Fairfield City Plan.*

Greater Sydney Commission, 2018. *Greater Sydney region plan: a metropolis of three cities: Connecting people.*

Greening Australia, 2008. *The Urban Heat Island Effect and Western Sydney.*

Hitachi Zosen Inova, 2018. *Dublin/Ireland Energy from Waste Plant.* Available at: http://www.hz-inova.com/cms/wp-content/uploads/2018/08/Dublin_Online_E.pdf

Institution of Lighting Professionals (UK), 2011. *Guidance for the reduction of obtrusive light.*

Intergovernmental Panel on Climate Change, 2018. *Protocol for predicting national methane emission inventories from landfills.*

Jo McDonald Cultural Heritage Management (JMCHM), 2004. *Heritage Conservation strategy for Aboriginal Sites in the Lands Owned by Austral Bricks P/L, Hartford Lane P/L, Jacfin P/L and Tesrol P/L in the Eastern Creek Business Park (Stage 3) Precinct Plan. Blacktown, NSW, APP Corporation Pty Ltd.*

Landcom, 2004. *Managing Urban Stormwater: Soils and Construction (Volume 1 and Volume 2A.*

Landscape Institute and Institute of Environmental Management & Assessment, 2013. *The Guidance for Landscape and Visual Impact Assessment: Third Edition.*

Margrit Koettig Archaeological Services (MKAS), 1989. *Results of Test Excavations at the Proposed Extension to the Waste Disposal Depot at Eastern Creek, Western Cumberland Plain, Sydney, Metropolitan Waste Disposal Authority.*

National Environment Protection Council (NEPC), 2014. *National Environment Protection (Air Toxic) Measures.*

National Environment Protection Council (NEPC), 2016. *National Environment Protection (Ambient Air Quality) Measures.*

National Health and Medical Research Council (NHMRC), 2018. *Australian Drinking Water Guidelines.*

New South Wales, & Department of Premier and Cabinet, 2011. *NSW 2021: a plan to make NSW number one, Dept. of Premier and Cabinet.*

NSW Department of Agriculture, water and the Environment, 2018. *National Waste Policy – Less Waste, More Resources.*

NSW Department of Environment and Climate Change and Water, 2009. *Interim construction noise guideline (ICNG).*

NSW Department of Environment and Conservation, 2009. *Assessing vibration: A technical guideline.*

NSW Department of Environment, Climate Change and Water (DECCW), 2010. *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales: Part 6 National Parks and Wildlife Act 1974.* Department of Environment, Climate Change and Water NSW, Sydney.

NSW Department of Environment, Climate Change and Water, 2010. *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010.*

NSW Department of Environment, Climate Change and Water, 2010. *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales.*

NSW Department of Environment, Climate Change and Water, 2011. *NSW Road Noise Policy.*

NSW Department of Industry, 2018. *Determining stream order fact sheet.*

NSW Department of Land and Water Conservation, 2000. *Guidelines for Erosion and Sediment Control on Building Sites.*

NSW Department of Planning, Industry and Environment, 2000. *Environmental Planning and Assessment Regulations.*

NSW Department of Planning, Industry and Environment, 2017. *Preparing an Environmental Impact Statement: Draft Environmental Impact Assessment Guidance Series June 2017.*

NSW Department of Planning, Industry and Environment, 2017. *Social impact assessment guideline for State significant mining, petroleum production and extractive industry development.*

NSW Department of Planning, Industry and Environment, 2019. *NSW Electricity Strategy.*

NSW Department of Primary Industries, 2007. *Key Fish Habitat Maps.*

NSW Department of Primary Industries, 2013. *Policy and guidelines for fish habitat conservation and management (update 2013).*

NSW Environment and Protection Authority, 2015. *NSW Energy from Waste Policy Statement (2015).*

NSW Environment Protection Authority, 2014. *Waste Avoidance and Resource Recovery Strategy (2014–2021).*

NSW Environment Protection Authority, 2014. *Waste Classification Guidelines.*

NSW Environment Protection Authority, 2017. *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales*.

NSW Environment Protection Authority, 2017. *Noise Policy for Industry.*

NSW Environment Protection Authority, 2019. *Future use of mixed waste organic outputs.*

NSW Environment Protection Authority, 2019. *NSW Circular Economy Policy Statement.*

NSW Environment Protection Authority, 2019. *WARR Strategy progress report 2017–18.*

NSW Environmental Protection Authority, 2016. *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW.*

NSW Government Department of Planning and Environment, 2017. *Social impact assessment guideline for State significant mining, petroleum production and extractive industry development.*

NSW Government, 1935. *Marine Services Act 1935.*

NSW Government, 1967. *Pipelines Act 1967.*

NSW Government, 1974. *National Parks and Wildlife Act 1974.*

NSW Government, 1977. *Heritage Act 1977.*

NSW Government, 1979. *Environmental Planning and Assessment Act 1979.*

NSW Government, 1983. *Aboriginal Land Rights Act 1983.*

NSW Government, 1991. *Protection of the Environment Administration Act 1991.*

NSW Government, 1992. *State Environmental Planning Policy No 33 – Hazardous and Offensive Development.*

NSW Government, 1993. *Roads Act 1993.*

NSW Government, 1994. *Fisheries Management Act 1994.*

NSW Government, 1995. *Ports and Maritime Administration Act 1995.*

NSW Government, 1996. *Management of Waters and Waterside Land Regulations 1996.*

NSW Government, 1997. *Contaminated Land Management Act 1997.*

NSW Government, 1998. *Marine Safety Act 1998.*

NSW Government, 2000. *Environmental Planning and Assessment Regulation 2000*

NSW Government, 2000. *Protection of the Environment Operations (Clean Air) Regulation 2000.*

NSW Government, 2001. *Waste Avoidance and Resource Recovery Act 2001.*

NSW Government, 2002. *State Environmental Planning Policy No 1 – Development Standards.*

NSW Government, 2006. *Western Sydney Parklands Act 2006.*

NSW Government, 2007. *State Environmental Planning Policy (Infrastructure) 2007.*

NSW Government, 2009. *Protection of the Environment Operations (General) Regulation 2009.*

NSW Government, 2009. *State Environmental Planning Policy (Western Sydney Parklands) 2009.*

NSW Government, 2010. *Protection of the Environment Operations (Clean Air) Regulation 2010.*

NSW Government, 2011. *State Environmental Planning Policy (State and Regional Development) 2011.*

NSW Government, 2011. *Work Health and Safety Act 2011.*

NSW Government, 2012. *Marine Pollution Act 2012.*

NSW Government, 2012. *Ports and Maritime Administration Regulation 2012.*

NSW Government, 2012 *State Environmental Planning Policy No 50 – Canal Estate Development.*

NSW Government, 2013. *Local Land Services Act 2013.*

NSW Government, 2013. *NSW Renewable Energy Action Plan.*

NSW Government, 2014. *Protection of the Environment Operations (Waste) Regulation 2014.*

NSW Government, 2015. *Biosecurity Act 2015.*

NSW Government, 2015. *Blacktown Local Environmental Plan.*

NSW Government, 2016. *Biodiversity Conservation Act 2016.*

NSW Government, 2016. *Coastal Management Act 2016.*

NSW Government, 2016. *Crown Lands Management Act 2016.*

NSW Government, 2016. *Marine Safety Regulation 2016.*

NSW Government, 2016. *State Environmental Planning Policy No 21 – Caravan Parks.*

NSW Government, 2016. *State Environmental Planning Policy No 36 – Manufactured Home Estates.*

NSW Government, 2016. *State Environmental Planning Policy No 44 – Koala Habitat Protection.*

NSW Government, 2017. *Crown Land Legislation Amendment Act 2017.*

NSW Government, 2017. *Protection of the Environment Operations (Noise Control) Regulation 2017.*

NSW Government, 2017. *State Environmental Planning Policy No 65 – Design Quality of Residential Apartment Development.*

NSW Government, 2017. *Work Health and Safety Regulation 2017.*

NSW Government, 2018. *Central City District Plan (Greater Sydney Commission, 2018).* Part of the Greater Sydney Region Plan.

NSW Government, 2018. *Greater Sydney Region Plan – A Metropolis of Three Cities.*

NSW Government, 2018. *NSW Roads and Maritime Services Practice Note – Guideline for Landscape Character and Visual Impact assessment EIA-N04.*

NSW Government, 2018. *Protection of the Environment Operations Amendment (Asbestos Waste) Act 2018.*

NSW Government, 2018. *State Environmental Planning Policy No 19 – Bushland in Urban Areas*

NSW Government, 2018. *State Environmental Planning Policy No 47 – Moore Park Showground.*

NSW Government, 2018. *State Environmental Planning Policy No 55 – Remediation of Land.*

NSW Government, 2018. *State Environmental Planning Policy No 64 – Advertising and Signage.*

NSW Government, 2018. *Water NSW Act 2014.*

NSW Government, 2019. *Contaminated Land Management Act 1997.*

NSW Government, 2019. *Protection of the Environment Operations (Clean Air) Regulation 2010.*

NSW Government, 2019. *Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2019.*

NSW Government, 2019. *Scrap Metal Industry Act 2016.*

NSW Government, 2019. *State Environmental Planning Policy No 70 – Affordable Housing (Revised Schemes).*

NSW Government, 2020. *Cleaning Up Our Act: The Future for Waste and Resource Recovery in NSW – Issues Paper.*

NSW Government, 2020. *Electricity Supply Act 1995.*

NSW Government, 2020. *Protection of the Environment Operations Act 1997.*

NSW Government, 2020. *Water Management Act 2000.*

NSW Office of Environment and Heritage (OEH), 2011. *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW.* Office of Environment and Heritage, Department of Premier and Cabinet, Sydney.

NSW Office of Environment and Heritage, 2015. *Cumberland Subregion Biodiversity Investment Opportunities Map (BIO Map) Biodiversity Corridors of Regional Significance (OEH 2015).*

NSW Office of Environment and Heritage, 2016. *Eastern Seaboard Climate Change Initiative: East Coast Lows Research Program Synthesis for NRM Stakeholders, Adapt NSW.*

NSW Office of Environment and Heritage, 2016. *NSW Climate Change Policy Framework.*

NSW Office of Environment and Heritage, 2017. *Biodiversity Assessment Method*

NSW Roads and Maritime Services, 2013. *Guide to QA Specification R44:– Earthworks (Edition 2).*

NSW Roads and Maritime Services, 2013. *Traffic Modelling Guidelines.*

NSW Roads and Maritime Services, 2016. *Technical Guide: Management of Road Construction and Maintenance Wastes (Issue 1.0).*

NSW Roads and Maritime Services, 2018. *Traffic Control at Work Sites: Technical Manual (Version 5.0).*

NSW Roads and Traffic Authority, 1988. *Road Design Guide.*

NSW Roads and Traffic Authority, 2002. *Guide to Traffic Generating Development.*

Oresundskraft, 2016. *Filbornaverket brochure English.* Available at: http://www.mynewsdesk.com/se/oresundskraft/documents/filbornaverket-in-english-53045

Organisation for Economic Co-operation and Development, 2018. *Australian National Waste Report.*

SA Environment Protection Authority, 2010. *Guidelines for Stockpile Management.*

SafeWork NSW, 2005. *Storage and Handling of Dangerous Goods: Code of Practice.*

The Greenhouse Gas Protocol, 2020. *The GHG Protocol for Project Accounting.* World Business Council for Sustainable Development & World Resources Institute.

United Nations, 2015. *Transforming our World: 2030 Agenda for Sustainable Development.*

Water Research Centre Limited, 2019. *DWtE – Characterisation and Classification of IBA.*

WaterNSW, 2020. *Guidelines for Development Adjacent to the Upper Canal and Warragamba Pipelines.*

Western Sydney Parklands Trust, 2016. *Western Sydney Parklands Plan of Management 2030.*

Western Sydney Parklands Trust, 2018. *Western Sydney Parklands (WSP) Plan of Management 2030.*

Western Sydney Regional Organisation of Councils, 2017–2021. *Western Sydney Regional Waste Avoidance and Resource Recovery Strategy 2017–2021.*

World Bioenergy Association, May 2013. *WBA fact sheet: Biogas – An Important Renewable Energy Source.*

Appendix A

Secretary's Environmental Assessment Requirements cross reference table

1.1 SEARs cross reference table

Assessment Requirements	Reference in EIS and Technical reports
Department of Planning and Environments Environmental Assessment Requirements *Section 4.12(8) of the Environmental Planning and Assessment Act 1979, Schedule 2 of the Environmental Planning and Assessment Regulation 2000*	
General Requirements	
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 (the EP&A Regulation).	Table 4.1 Chapter 4 Statutory context
The EIS must include a detailed description of the site including any existing or approved operations, site history and development consents.	Section 2.6.6 Chapter 2 Strategic context
The EIS must include a detailed description of the development, including: • Need for the proposed development	Section 2.1-2.5 Chapter 2 Strategic context
• Alternatives considered	Section 2.6 Chapter 2 Strategic context
• Justification for the proposed development	Section 2.1-2.6 Chapter 2 Strategic context Chapter 25 Evaluation and conclusions
• Likely staging of the development - including demolition, construction, and operational stage/s	Section 3.2.1 Chapter 3 Proposal description
• Likely interactions between the development and existing, approved and proposed operations in the vicinity of the site	Section 23.2 Chapter 23 Cumulative impacts
• Plans of any proposed building works	Section 3.2 Chapter 3 Proposal description
• Contributions required to offset the proposal	Section 6.4.3 and 6.4.4 Chapter 6 Engagement Section 21.3 Chapter 21 Biodiversity Section 8.1 Technical report Q Biodiversity development assessment report

Assessment Requirements	Reference in EIS and Technical reports
The EIS must include a consideration of all relevant environmental planning instruments, including identification and justification of any inconsistencies with these instruments.	Section 4.4 and 4.5 Chapter 4 Statutory context
The EIS must include a consideration of issues identified in Attachment 2 (public authority responses to key issues).	Addressed in this table (Appendix A)
The EIS must include a risk assessment of the potential environmental impacts of the development, identifying the key issues for further assessment.	Section 7.3 Chapter 7 Environmental assessment scope
The EIS must include a detailed assessment of the key issues specified below, and any other significant issues identified in this risk assessment, which includes: • A description of the existing environment, using sufficient baseline data. • An assessment of the potential impacts of all stages of the development, including any cumulative impacts of the proposed facility with any approved (but not yet constructed) developments, including The Next Generation's proposal for an energy from waste facility at Eastern Creek (currently subject to proceedings in the NSW Land and Environment Court). • A description of the measures that would be implemented to avoid, minimise and if necessary, offset the potential impacts of the development, including proposals for adaptive management and/or contingency plans to manage any significant risks to the environment. • A consolidated summary of all the proposed environmental management and monitoring measures, highlighting commitments included in the EIS.	Chapters 8-23 Technical reports A-Q Section 23.2 Chapter 23 Cumulative impacts Chapter 24 Summary of management measures
The EIS must include a consideration of the likely impacts of any related development associated with the development, including any pre-processing infrastructure, ash management infrastructure and the high voltage electricity connection.	Sections 22.1 – 22.7 Chapter 22 Related development
The EIS must also be accompanied by a report from a qualified quantity surveyor providing: • A detailed calculation of the capital investment value (CIV) (as defined in clause 3 of the EP&A Regulation) of the proposal, including details of all assumptions and Components from which the CIV calculation is derived. The report shall be prepared on company letterhead and indicate applicable GST component of the CIV • An estimate of jobs that will be created during the construction and operational phases of the proposed development • Certification that the information provided is accurate at the date of preparation.	Appendix D Statement of CIV

Assessment Requirements	Reference in EIS and Technical reports
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 justification for the approach.	Section 6.1 Chapter 6 Engagement Section 3 Appendix F Community and stakeholder engagement report
A description of the form of engagement activities undertaken.	Section 6.1 and 6.2 Chapter 6 Engagement Section 3.4 and 3.5 Appendix F Community and stakeholder engagement report
A report on the results of the implementation of the strategy including issues raised by the community and the surrounding occupiers and landowners that may be impacted by the proposal.	Section 6.3 Chapter 6 Engagement Section 4 Appendix F Community and stakeholder engagement report
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 Chapter 6 Engagement Section 4 and 5 Appendix F Community and stakeholder engagement report Section 2.6 Chapter 2 Strategic context
Details of the proposed approach to future community and stakeholder engagement based on the results of the consultation.	Section 6.4 Chapter 6 Engagement Section 5.3 Appendix F Community and stakeholder engagement report
Details of how monitoring data will be communicated and made publicly accessible to the community.	Section 6.4 Chapter 6 Engagement Section 5.3 Appendix F Community and stakeholder engagement report
A commitment to the establishment of a Community Liaison Group comprised of key local stakeholders.	Section 6.4.3 Chapter 6 Engagement Section 5.3 of Appendix F Community and stakeholder engagement report

Assessment Requirements	Reference in EIS and Technical reports
Suitability of the Site	
Need and justification for the development having regard to its location and impacts, the suitability of the site and public interest.	Section 2.1-2.6 Chapter 2 Strategic context Section 25.1 Chapter 25 Evaluation and conclusion
Details of all development consents and approved plans previously and/or currently applicable to the site.	Section 2.6.6 Chapter 2 Strategic context
Statutory and Strategic Context	
Demonstration the proposal is generally consistent with all relevant planning strategies, environmental planning instruments, district plans and justification for any inconsistencies.	Section 2.5 Chapter 2 Strategic context Section 4.4 and 4.5 Chapter 4 Statutory context
Addressing the statutory provisions applying to the development contained in all relevant environmental planning instruments, including: • 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 • State Environmental Planning Policy (Coastal Management) 2018 • State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011 • State Environmental Planning Policy (Infrastructure) 2007 • State Environmental Planning Policy (State and Regional Development) 2011 • State Environmental Planning Policy (Western Sydney Parklands) 2009 • Blacktown Local Environmental Plan 2012.	Section 4.4 Chapter 4 Statutory context

Assessment Requirements	Reference in EIS and Technical reports
Air Quality and Odour	
Addressing the relevant provisions in, and consistency with, the following State and international waste legislation and policy: • NSW Energy from Waste Policy Statement (EPA 2015) • NSW Protection of the Environment Operations (Waste) Regulations 2014 • NSW Waste Avoidance and Resource Recovery Strategy 2014-2021 • NSW Waste Classification Guidelines • NSW Waste Levy Guidelines (EPA 2018) • European IPPC Bureau 'Industrial Emissions Directive' and BAT (Best • Available Techniques) Reference Document (BREF) BREF 2019.	Section 2.5 Chapter 2 Strategic context Section 5.2 and 5.3 Chapter 5 EfW policy Section 2, 3.7 and 4.2 Technical report C Waste and resource management technical report Sections 4 and 8 Technical report A Air quality and odour impact assessment
A quantitative assessment of the potential air quality, dust and odour impacts of all stages of the development (construction and operation) on surrounding landowners, businesses and sensitive receptors, in accordance with the relevant Environment Protection Authority guidelines, including 'worst case' emission scenarios (including a trip or emergency shutdown).	Section 8.3 Chapter 8 Air quality and odour Section 7 Technical report A Air quality and odour impact assessment
Identification of all potential fugitive and point source emissions of pollutants and odour for all stages of the proposal.	Section 8.3 Chapter 8 Air quality and osour Sections 6 Technical report A Air quality and odour impact assessment
Details of the receiving environment, including meteorology and climate, topography, surrounding land use, sensitive receptors and ambient air quality.	Section 8.2 Chapter 8 Air quality and odour Sections 3.1 and 5 Technical report A Air quality and odour impact assessment
Justification for the level of assessment undertaken on the basis of risk factors, including but not limited to the proposal location, characteristics of the receiving environment and the type and quantity of the pollutants emitted.	Section 6 Technical report A Air quality and odour impact assessment
Details of the proposed technology and a demonstration that it is technically fit for-purpose, including details of commissioning and proof of performance.	Section 3.2.2.4 and 3.4 Chapter 3 Proposal description Section 3 and 4 Technical report D: Best available techniques assessment

Assessment Requirements	Reference in EIS and Technical reports
	Section 8 Technical report A Air quality and odour impact assessment
Details of emission control techniques and practices, including emission sampling and monitoring, that will be employed, and benchmark these against best practice emission control and management, with reference to the European IPPC Bureau 'Industrial Emissions Directive', BAT (Best Available Techniques) Reference Document (BREF) BREF 2019 and the Environment Protection Authority's 'NSW Energy from Waste Policy' (2015).	Section 3.4 Chapter 3 Proposal description Section 5.10 Chapter 5 EfW policy Section 2, 3, 4 Technical report D: Best available techniques assessment Sections 8 Technical report A Air quality and odour impact assessment
Demonstrate a commitment to continual improvement with respect to emission control techniques and practices.	Section 3.1 Chapter 3 Proposal description Section 8 Technical report A Air quality and odour impact assessment
An assessment of cumulative air quality impacts associated with the facility and surrounding developments, including any approved (but not yet constructed) developments and The Next Generation's proposal for an energy from waste facility at Eastern Creek (currently subject to proceedings in the NSW Land and Environment Court).	Section 8.3 Chapter 8 Air quality and odour Section 23.2 Chapter 23 Cumulative impacts Sections 7.1.2 Technical report A Air quality and odour impact assessment
Human Health Risk	
A quantitative human health risk assessment in accordance with the 'Environmental Health Risk Assessment: Guidelines for assessing human health risks from environmental hazards' (enHealth, 2012) covering the inhalation of criteria pollutants and exposure (from all pathways, i.e. inhalation, ingestion and dermal) to specific air toxics, including impacts from the transport of waste material.	Section 9.3 Chapter 9 Human health risk Technical report B Human health risk assessment
Consideration of the impacts on drinking water sources such as Prospect Reservoir and rainwater tanks, including the impacts on water quality and human health.	Section 9.3 Chapter 9 Human health risk Section 4.7 and 5.4 Technical report B Human health risk assessment

Assessment Requirements	Reference in EIS and Technical reports
Waste Management	
Details and a description of the sources, classes, quantities and composition of waste streams that would be thermally treated at the facility.	Section 3 Technical report C Waste and resource management technical report
Details of the processing capacity of the facility including typical, maximal and minimal rates of processing.	Section 3.4 Chapter 3 Proposal description
Demonstrate that waste used as a feedstock in the facility would be the residual from a resource recovery process that maximises the recovery of material in accordance with Environment Protection Authority guidelines and 'NSW Energy from Waste Policy Statement' (2015).	Section 5.6 Chapter 5 EfW Policy Section 3 Technical report C Waste and resource management technical report
A detailed description of waste processing procedures for each waste type received at the premises, including the types of pollution which may result from the storage and processing of that waste, mitigation measures for managing any such impacts and contingency measures that would be implemented if inappropriate materials are identified.	Section 3.4 Chapter 3 Proposal description Section 3.8 Technical report C Waste and resource management technical report
Details of the maximum annual throughput of waste and the maximum volume of waste to be stored at the premises at any one time.	Section 3.4 Chapter 3 Proposal description
Details of how the EPA's record keeping and reporting requirements will be met.	Section 4.2 Technical report C Waste and resource management technical report
A list and description, including quantities, composition and classification of waste material produced (solid, liquid and gaseous) from the facility, including details of proposed management and disposal of those waste materials.	Section 5.11 Chapter 5 EfW policy Table 10.2 Chapter 10 Waste management Section 5 Technical report C Waste and resource management technical report
Procedures for the management of other solid, liquid and gaseous waste streams.	Table 10.2 Chapter 10 Waste management
Demonstrate that any waste material produced from the energy from waste facility for land application is fit-for-purpose and poses minimal risk of harm to the environment in order to meet the requirements for consideration of a resource recovery exemption by the Environment Protection Authority.	Section 5.1 Technical report C Waste and resource management technical report
Identify 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 2.5 Chapter 2 Strategic context Section 5.3 and 5.6 Chapter 5 EfW policy

Assessment Requirements	Reference in EIS and Technical reports
	Section 3.2-3.5 of Technical report C Waste and resource management technical report
Soils and Water	
A description of existing baseline conditions including soil, water, groundwater resources, topography, hydrology, drainage lines, watercourses and riparian lands on or nearby to the site.	Section 11.2 Chapter 11 Soils and water Section 12.2 Chapter 12 Hydrology and flooding Section 21.2 Chapter 21 Biodiversity Section 2 Technical report H Hydrology and flooding assessment Section 3 Technical report F Soils and water assessment Section 5 Technical report Q Biodiversity development assessment report
An assessment of impacts on surface and ground water sources (both quality and quantity), related infrastructure, watercourses and riparian land and measures proposed to reduce and mitigate these impacts.	Section 11.3 Chapter 11 Soils and water Section 12.3 Chapter 12 Hydrology and flooding Section 4 Technical report F Soils and water assessment Section 4 Technical report H Hydrology and flooding assessment Section 7 Technical report Q Biodiversity development assessment report
An assessment to demonstrate the development will have a Neutral or Beneficial Effect (NorBE) on water quality in the Sydney drinking water catchment.	Section 9.3.2 Chapter 9 Human health risk Section 4.7 Technical report B Human health risk assessment report Section 4.2.1 Technical report H Hydrology and flooding assessment

Assessment Requirements	Reference in EIS and Technical reports
Proposed surface and groundwater monitoring activities and methodologies.	Section 11.3 and 11.4 Chapter 11 Soils and water Section 12.3 and 12.4 Chapter 12 Hydrology and flooding Section 5 Technical report F Soils and water assessment Section 4 and 5 Technical report H Hydrology and flooding assessment
Consideration of relevant NSW government guidelines and legislation, including the Water Act 1912 and Water Management Act 2000, NSW water quality and river flow objectives, guidelines for controlled activities on waterfront land (2018).	Section 12.2 Chapter 12 Hydrology and flooding Section 3 Technical report H Hydrology and flooding 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 water use at the site.	Section 12.3 Chapter 12 Hydrology and flooding Section 4 Technical report H Hydrology and flooding assessment
A flood impact assessment, including an assessment of overland flow paths and flood risk associated with the development both on and off the site.	Section 12.3 Chapter 12 Hydrology and flooding Sections 2 and 4 Technical report H Hydrology and flooding assessment
Details of any groundwater extraction and any works with the potential to intercept the groundwater table.	Section 11.3 Chapter 11 Soils and water Section 4 Technical report F Soils and water assessment
A stormwater management strategy that provides details of stormwater and wastewater management systems including the capacity of onsite detention systems, details of water sensitive urban design measures, discharge locations, pathways and quality and measures to treat, reuse or dispose of water.	Section 12.3 Chapter 12 Hydrology and flooding Section 4 Technical report H Hydrology and flooding assessment

Assessment Requirements	Reference in EIS and Technical reports
Details of construction works and spoil disposal, including a description of erosion and sediment controls, bulk earthworks, the management of acid sulfate soils and contingency plans for potential construction incidents.	Section 3.2 Chapter 3 Proposal description Section 11.3 and 11.4 Chapter 11 Soils and water Section 10.3 Chapter 10 Waste management Section 4 and 5 Technical report F Soils and water assessment
Characterisation of the nature and extent of any contamination on the site and a description of proposed management measures in accordance with SEPP 55.	Section 11.3 and 11.4 Chapter 11 Soils and Water Technical report G Detailed site investigation Technical report G2 Remediation action plan Technical report G3 Due diligence contamination investigation
Noise and Vibration	
A quantitative assessment of potential construction, operational and transport noise and vibration impacts, including impacts on nearby sensitive receivers, landowners and businesses, in accordance with relevant environment protection authority guidelines.	Section 13.3 Chapter 13 Noise and vibration Sections 4, 5, 6, 7 Technical report I Noise and vibration impact assessment
Details and justification of the proposed noise management, mitigation and monitoring measures.	Section 13.3 and 13.4 Chapter 13 Noise and vibration Section 4, 5, 6 and 7 Technical report I Noise and vibration impact assessment
Hazard and Risk	
A Preliminary Hazard Analysis (PHA) prepared in accordance with the Department's Hazardous Industry Planning Advisory Paper No. 6, 'Hazard Analysis' and Multi-Level Risk Assessment (DoP 2011).	Technical report J Preliminary hazard analysis
Details of fire/emergency measures and procedures.	Section 3.6 Chapter 3 Proposal description

Assessment Requirements	Reference in EIS and Technical reports
Detailed contingency measures for any potential incidents or equipment failure or in the event of a shutdown.	Section 14.3 and 14.6 Chapter 14 Hazard and risk Appendix B of Technical report J Preliminary hazard analysis
Traffic and Transport	
A quantitative traffic impact assessment prepared in accordance with relevant Roads and Maritime Services guidelines that assesses both construction and operational traffic.	Section 15.3 Chapter 15 Traffic and transport Section 4 Technical report K Traffic and transport assessment report
Daily and peak traffic movements likely to be generated by the proposed development during construction and operation, including consideration of cumulative traffic impacts at key intersections using SIDRA or similar traffic model and the need (and associated funding) for road improvement works (if required).	Section 15.3 Chapter 15 Traffic and transport Section 4 Technical report K Traffic and transport assessment report
An assessment of impacts on the intersection of Wallgrove Road and the Austral Bricks Road (Unnamed).	Section 15.3 Chapter 15 Traffic and transport Section 4 Technical report K Traffic and transport assessment report
Details of the proposed site access / egress and parking provisions, including compliance with the requirements of the relevant Australian Standards (i.e. turn paths, sight distance requirements, aisle widths, etc.).	Section 15.3 Chapter 15 Traffic and transport Section 4 and Appendix B Technical report K Traffic and transport assessment report
Detailed plans of the proposed layout of the internal road network, heavy and light vehicle traffic movements and parking on site in accordance with the relevant Australian Standards.	Section 4 and Appendix B Technical report K Traffic and transport assessment report
Identification of the truck routes between waste source locations and the site for fuel deliveries, and between the site and potential waste disposal sites for waste fuel products.	Section 15.3 Chapter 15 Traffic and transport Section 4 Technical report K Traffic and transport assessment report
Details of the types of material being transported and whether the material would be classified as dangerous goods under the Australian Dangerous Goods Code.	Section 14.3 Chapter 14 Hazard and risk Section 2.4 Technical report J Preliminary hazard analysis

Assessment Requirements	Reference in EIS and Technical reports
Consideration of the NSW Government's Freights and Ports Plan 2018 – 2023.	Section 3.1.1 Technical report K Traffic and transport assessment report
A draft construction traffic management plan.	Appendix A Technical report K Traffic and transport assessment report
An assessment of the accessibility of the development by public and active transport, including details of measures to prevent detrimental impacts on any bike and active transport routes in the vicinity of the site, the potential for implementing a location-specific sustainable travel plan.	Section 15.2 and 15.3 Chapter 15 Traffic and transport Section 2 and 5 Technical report K Traffic and transport assessment report
Visual	
A landscape character and visual impact assessment that includes a description of the visual catchment and considers the potential visual impacts of the development on the amenity of the surrounding area particularly from nearby public receivers and significant vantage points of the broader public domain.	Section 16.3 Chapter 16 Landscape and visual Section 5, 6, 7 and 8 Technical report L Landscape and Visual Impact Assessment.
Consideration of the proposed building height, stack height, bulk and scale, signage, lighting and the emissions plume within the context of the locality.	Section 4.6 Statutory Context Section 16.3 Chapter 16 Landscape and visual Section 6 Technical report L Landscape and visual impact assessment
Details of architectural design measures to ensure a high-quality design.	Section 3.3 Chapter 3 Proposal description Appendix B Architectural and landscape strategy design report
Justification for the positioning and height of the stack, including consideration of options for stack design and height.	Section 2.6.8 and 2.6.9 Chapter 2 Strategic context Appendix B Architectural and landscape strategy design report
Details of materials and finishes and all proposed mitigation measures.	Section 4 Appendix B Architectural and landscape strategy design report

Assessment Requirements	Reference in EIS and Technical reports
	Section 6 Technical report L Landscape and visual impact assessment
A detailed photo-montage based analysis of the visual impacts of the development and emission stack.	Section 16.3 Chapter 16 Landscape and visual Section 7 Technical report L Landscape and visual impact assessment
Details of landscape works that will complement and screen the development showing the use of high-quality landscaping material.	Section 6 Appendix B Architectural and landscape strategy design report
Consideration of the use of green walls, green roof or cool roof design having regard to the 'Urban Green Cover in NSW Technical Guidelines' (OEH 2015).	Section 16.3 Chapter 16 Landscape and visual Section 3 and 7 Technical report L Landscape and visual impact assessment Section 6 Appendix B Architectural and landscape strategy design report
Social	
A social impact assessment, which: • Identifies and analyses the potential social impacts of the development, from the points of view of the affected community/ies and other relevant stakeholders. • Assesses the significance of positive, negative, and cumulative social impacts considering likelihood, extent, duration, severity / scale, sensitivity/importance, and level of concern / interest. • Includes mitigation measures for likely negative social impacts, and any proposed enhancement measures • Details how social impacts will be adaptively monitored and managed over time • Details community benefits of the facility.	Section 17.3, 17.4 and 17.5 Chapter 17 Social Section 5 and 6 Technical report M Social impact assessment
Aircraft Safety	
A plume rise assessment in accordance with relevant Civil Aviation Safety Authority guidelines.	Section 14.3 Chapter 14 Hazard and risk Section 3.2.14 Technical report J Preliminary hazard analysis

Assessment Requirements	Reference in EIS and Technical reports
Greenhouse Gas and Energy Efficiency	
A quantitative analysis of potential Scope 1, 2 and 3 greenhouse gas emissions from the development and an assessment of potential impacts on the environment in accordance with relevant guidelines.	Section 18.3 Chapter 18 Greenhouse gas and energy efficiency Section 4 Technical report N Greenhouse gas and energy efficiency assessment report
A description of construction and operational control measures to be implemented to ensure the development is energy efficient and minimises greenhouse gas generation.	Section 18.4 Chapter 18 Greenhouse gas and energy efficiency Section 5 Technical report N Greenhouse gas and energy efficiency assessment report
Heritage	
An Aboriginal cultural heritage assessment report in accordance with the 'Code of Practice for Archaeological Investigations of Aboriginal Objects in NSW' (OEH 2010) and the Guide to investigation, assessing and reporting on Aboriginal Cultural Heritage in NSW (DECCW 2011).	Technical report O Aboriginal cultural heritage assessment
Consultation with Aboriginal people must be undertaken and documented in accordance with the 'Aboriginal cultural heritage consultation requirements for proponents' (DECCW 2010). The significance of cultural heritage values for Aboriginal people who have a cultural association with the land must be documented in the ACHAR.	Section 19.2 Chapter 19 Heritage Section 5 Technical report O Aboriginal cultural heritage assessment
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 the Environment, Energy and Science Group in the Department of Planning, Industry and Environment.	Section 19.3 Chapter 19 Heritage Section 7, 8 and 9 Technical report O Aboriginal cultural heritage assessment
Utilities and Services	
Details of existing capacity and requirements of the development for sewerage, water, electricity, waste disposal, telecommunications and gas in consultation with the relevant service providers.	Section 20.2 Chapter 20 Utilities and services Section 2 Technical report P Utilities and services assessment

Assessment Requirements	Reference in EIS and Technical reports
A description of the staging, if any, of infrastructure works, any infrastructure upgrades that are required off-site to facilitate the orderly and economic development of the site and a description of the arrangements that would be put in place to ensure that these upgrades are implemented in a timely manner and maintained.	Sections 22.2 to 22.7 Chapter 22 Related development Section 4 Technical report P Utilities and services assessment
Demonstration that satisfactory arrangements have been made for drinking water, wastewater and recycled water (if required) services.	Section 20.3 and 20.4 Chapter 20 Utilities and services Section 22.5 Chapter 22 Related development Section 4 Technical report P Utilities and services assessment Appendix A and C Technical report P Utilities and services assessment
A feasibility study for the preferred connection to the electricity grid.	Section 4.3 Technical report P Utilities and services assessment Appendix D Technical report P Utilities and services assessment
Details of measures to protect existing Sydney Water assets or easements.	Section 22.5 Chapter 22 Related development Section 4 and Appendix C Technical report P Utilities and services assessment
Biodiversity	
An assessment of biodiversity impacts in accordance with the Biodiversity Assessment Method and documented in a Biodiversity Development Assessment Report.	Section 21.3 Chapter 21 Biodiversity Section 7 Technical report Q Biodiversity development assessment report
Measures to avoid, mitigate or offset all direct, indirect and prescribed impacts in accordance with the Biodiversity Assessment Method.	Section 21.4 Chapter 21 Biodiversity Section 7 and 9 Technical report Q Biodiversity development assessment report

Assessment Requirements	Reference in EIS and Technical reports
A vegetation management plan that includes restoration of the riparian corridor.	Appendix G Technical report Q Biodiversity development assessment report
Planning Agreement/Contributions	
Including consideration of Council's Section 7.11 Contribution Plan and/or details of any Voluntary Planning Agreement.	Section 6.4 Chapter 6 Engagement Section 5 Appendix F Community and stakeholder engagement report
Plans and Documents	
The EIS must include all relevant plans, architectural drawings, diagrams and relevant documentation required under Schedule 1 of the Regulation. Provide these as part of the EIS rather than as separate documents. The EIS must include high quality files of maps and figures of the subject site and proposal.	Appendix C Drawings
Consultation	
During the preparation of the EIS, you must consult with the relevant local, State or Commonwealth Government authorities, service providers, community groups and affected landowners. In particular you must consult with: • Blacktown City Council • Fairfield City Council • Environment Protection Authority • Department of Primary Industries • Environment, Energy and Science (previously Office of Environment and Heritage) • Transport for NSW (including Roads and Maritime Services) • NSW Ministry of Health • Western Sydney Local Health District • NSW Fire and Rescue • Department of Planning, Industry and Environment – Water and Natural Resources Access Regulator (previously WaterNSW) • Sydney Water • Endeavour Energy	Section 6.2, 6.3 Chapter 6 Engagement Section 3 and 4 Appendix F Community and stakeholder engagement report Section 4, Appendix C, D and E Technical report P Utilities and services assessment Section 3 and 4 Technical report H Hydrology and flooding Section 3.2.14 Technical report J Preliminary hazards assessment Section 2.6 Chapter 2 Strategic context

Assessment Requirements	Reference in EIS and Technical reports
• SafeWork NSW • Western Sydney Airport Corporation • Civil Aviation Safety Authority • Department of Energy and Environment • nearby landowners, businesses and occupiers that may be affected by the proposal. 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.	
If you do not lodge a Development Application and EIS for the development within two years of the issue date of these SEARs, you must consult further with the Secretary in relation to the preparation of the EIS.	Noted
Blacktown City Council submission to SEARs request for SSD 10395	
Overall and General Requirements	
The EIS must include a detailed description of the site, and any existing or approved operations.	Section 2.6.6 Chapter 2 Strategic context
The EIS must include a detailed description of the development, including: • need for the development • alternatives considered • engineering and architectural plans • justification for the development taking into consideration its location, any environmental impacts of the development, the suitability of the site and whether the development is in the public interest • likely staging of the development	Section 2.1-2.6 Chapter 2 Strategic context Section 3.2.1 Chapter 3 Proposal description Section 25.4 Chapter 25 Evaluation and conclusion Appendix C Drawings
The EIS must include likely interactions between the development and existing, approved and proposed operations in the vicinity of the site.	Section 23.2 Chapter 23 Cumulative impacts
The EIS must include a consideration of any relevant statutory provisions.	Section 4.4 and 4.5 Chapter 4 Statutory context

Assessment Requirements	Reference in EIS and Technical reports
The EIS must include a risk assessment of the potential environmental and health impacts of the development, identifying the key issues for further assessment.	Section 7.3 Chapter 7 Environmental assessment scope
The EIS must include a detailed assessment of the key issues specified below, and any other significant issues identified in the risk assessment, which includes: • a description of the existing environment, using sufficient baseline data. • 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. • a description of the measures that would be implemented to avoid, minimise and, if necessary, offset the potential impacts of the development, including proposals for adaptive management and/or contingency plans to manage significant risks to the environment and the health of the community.	Chapter 8-24 Technical reports A-Q Chapter 24 Summary of management and mitigation measures
The EIS must include a consolidated summary of all proposed environmental management, mitigation and monitoring measures, highlighting all commitments included in the EIS.	Chapter 24 Summary of management and mitigation measures
The proponent company must demonstrate that it is eligible to hold an environmental licence for the proposed facility and can demonstrate its proven environmental responsibility at its other facilities, including a commitment to ongoing environmental improvement.	Section 1.4 Chapter 1 Introduction Section 3.1 Chapter 3 Proposal description
The applicant should demonstrate a commitment to obtain ISO 14001 environmental certification to demonstrate that the process being undertaken is industry best practice using the best available technology.	Section 1.4 and 1.5 Chapter 1 Introduction Section 3.1 Chapter 3 Proposal description Technical report D Best available techniques assessment
The applicant must demonstrate that the operator's environmental credentials, as well as the designer and builder, will ensure the required technology, controls, maintenance and monitoring will be a priority.	Section 3.1 Chapter 3 Proposal description
The applicant should demonstrate and incorporate requirements for future technology and environmental upgrades to be researched and mandated as part of the licence provisions.	Section 3.4 Chapter 3 Proposal description Technical report D Best available techniques assessment
The applicant should demonstrate a commitment to establish a Community Liaison Group of local stakeholders, including nearby businesses, objectors and local residents, Council and the EPA.	Section 6.4 Chapter 6 Engagement

Assessment Requirements	Reference in EIS and Technical reports
	Section 5 Appendix F Community and stakeholder engagement report
The applicant should demonstrate a commitment to offset some community concern by funding local community improvements and enhancement programs, which must be outlined in a Community Strategy and incorporate a visitor information and education centre.	Section 6.4 Chapter 6 Engagement Section 5 Appendix F Community and stakeholder engagement report
The applicant must demonstrate how they have obtained a social licence for the proposal.	Section 6.1 Chapter 6 Engagement Section 3 Appendix F Community and stakeholder engagement report
The applicant should demonstrate a commitment to host regular community forums and hold an annual open day to allow residents to tour the facility.	Section 6.4 Chapter 6 Engagement Section 5 Appendix F Community and stakeholder engagement report
The applicant should demonstrate a commitment to a modular design that can be scaled up or down dependent on the NSW EPA's waste disposal priorities and needs.	Section 3.3.1 Chapter 3 Proposal Description
Statutory Context	
Address the relevant statutory provisions applying to the site contained in all relevant Environmental Planning Instruments and the Environmental Planning and Assessment Regulation 2000, including: • State Environmental Planning Policy (State & Regional Development) 2011 • State Environmental Planning Policy (Infrastructure) 2007 • State Environmental Planning Policy No. 33 - Hazardous and Offensive Development • State Environmental Planning Policy (Western Sydney Parklands) 2009.	Section 4.4 and 4.5 Chapter 4 Statutory context

Assessment Requirements	Reference in EIS and Technical reports
Detail the permissibility of the proposal under the relevant EPIs and the nature and extent of any prohibitions or restrictions that apply to the development.	Section 4.4 and 4.5 Chapter 4 Statutory context
Identify the development standards that apply to the site. Outline and justify any non- compliances with the development standards.	Section 4.4 and 4.5 Chapter 4 Statutory context
Demonstrate that satisfactory arrangements have been, or would be, made to provide or contribute to the provision of necessary local and regional infrastructure required to support the development and the local community.	Section 22.1-22.7 Chapter 22 Related development
Demonstrate that the site is suitable for the proposed use in accordance with the provisions of SEPP 55.	Section 11.3 Chapter 11 Soils and water Technical report G2 Remediation action plan
Strategic Context	
Address the proposal against the relevant planning and policy provisions, goals and strategic planning objectives in the following documents: • A Metropolis of Three Cities — the Greater Sydney Region Plan • Central City District Plan Detail how the development promotes the objectives of these strategic plans or is consistent with their provisions.	Section 2.5 Chapter 2 Strategic context
Waste Management	
Identify, quantify and classify the likely waste streams to be generated and used as source material and describe the measures to be implemented to manage, reuse, recycle and safely dispose of this waste. Identify appropriate servicing arrangements, including but not limited to waste management, loading zones and mechanical plant for the site.	Section 5.4 and 5.6.2 Chapter 5 EfW policy Section 3 Technical report C Waste and resource management technical report
Waste management details should include: • A description of the classes and quantities of waste that would be thermally treated at the facility.	Section 3.4 Chapter 3 Proposal description Section 3 Technical report C Waste and resource management technical report
• Demonstrate that waste used as feedstock in the plant would be residual waste from a resource recovery process that maximises the recovery of material in accordance with the NSW Energy from Waste policy statement.	Section 5.4 and 5.6 Chapter 5 EfW policy Section 3 Technical report C Waste and resource management technical report

Assessment Requirements	Reference in EIS and Technical reports
• Procedures that would be implemented to control the inputs to the plant, including contingency measures that would be implemented if inappropriate materials are detected.	Section 3.4 Chapter 3 Proposal description Section 3.8 Technical report C Waste and resource management technical report
• An outline as to how foreign objects will be excluded from the waste stream to prevent the need for an abnormal operation allowance that has the ability to have an impact on meeting emission criteria.	Section 3.4 Chapter 3 Proposal description Section 3.8 and 3.9 Technical report C Waste and resource management technical report
• Details about the location and size of stockpiles of unprocessed and processed recycled waste at the site.	Section 3.4 Chapter 3 Proposal description
• Demonstrate that any waste material produced from the facility for land application is fit-for-purpose and poses minimal risk of harm to the environment in order to meet the requirements for consideration of a resource recovery exemption by the EPA under Clause 51A of the Protection of the Environment Operations (Waste) Regulation 2005.	Section 2.5 Chapter 2 Strategic context Section 5.11 Chapter 5 EfW policy Section 5.1 Technical report C Waste and resource management technical report
• Procedures for the management of other solid, liquid and gaseous waste streams.	Section 3.4 Chapter 3 Proposal description Table 10.2 Chapter 10 Waste management
• Describe how waste would be treated, stored, used, disposed of and handled on site, and transported to and from the site, and the potential impacts associated with these issues, including current and future off-site waste disposal methods.	Section 3.4 Chapter 3 Proposal description Section 5.8 and 5.11 Chapter 5 EfW policy Section 10.3 Chapter 10 Waste management Section 15.3 Chapter 15 Traffic and transport Section 14.3 and 14.6 Chapter 14 Hazard and risk
• Demonstrate how all waste is either pre-sorted and shredded or sorted and shredded at the facility prior to incineration, to ensure an even fuel source and prevent any contaminants like fuel cylinders and engine blocks entering the incineration process.	Section 3.4 Chapter 3 Proposal description Section 2.6.4 Chapter 2 Strategic context Section 5.6.2 and 5.8 Chapter 5 EfW Policy

Assessment Requirements	Reference in EIS and Technical reports
• Identify 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 2.5 Chapter 2 Strategic context Section 5.3, 5.4 and 5.6 Chapter 5 EfW Policy Section 3.2-3.5 Technical report C Waste and resource management technical report
• Outline how the resource recovery criteria for mixed wastes as outlined in the NSW Energy from Waste Policy Statement will be achieved.	Section 5.2 and 5.6 Chapter 5 EfW policy Section 3 Technical report C Waste and resource management technical report
Ecologically Sustainable Development (ESD)	
Detail how ESD principles (as defined in Clause 7(4) of Schedule 2 of the Environmental Planning and Assessment Regulation 2000) will be incorporated into the design, construction and ongoing operational phases of the development. Include a description of the measures that would be implemented to minimise the consumption of resources and water and energy, including an Integrated Water Management Plan which details any proposed alternative water supply, proposed end uses of potable and non-potable water, and water sensitive urban design.	Section 25.5 Chapter 25 Evaluation and conclusion Section 4.2 Technical report H Hydrology and flooding
A greenhouse gas assessment, including an assessment of the potential scope 1, 2 and 3 greenhouse gas emissions from the project and an assessment of the potential impacts of these emissions on the environment.	Section 18.3 Chapter 18 Greenhouse gas and energy efficiency Section 4 Technical report N Greenhouse gas and energy efficiency assessment report
A detailed description of the measures that would be implemented on site to ensure that the project is energy efficient.	Section 18.4 Chapter 18 Greenhouse gas and energy efficiency Section 5 Technical report N Greenhouse gas and energy efficiency assessment report
Environmental Health Impacts	
Address the impacts the development will have on the environment, including hazardous chemicals, pest control, ventilation, disease outbreaks, quarantine and hygiene protocols for staff and visitors.	Section 10.3 and 10.4 Chapter 10 Waste management Section 14.3 Chapter 14 Hazard and risk

Assessment Requirements	Reference in EIS and Technical reports
	Sections 3-8 Technical report J Preliminary hazard analysis Section 21.3 Chapter 21 Biodiversity Section 7 Technical report Q Biodiversity development assessment report
The relevant Acts, policies and guidelines that need to be addressed include: • Pesticides Act 1999 • Protection of the Environment Operations Act 1997 • Public Health Act 2010 • in terms of the Preliminary Hazard Analysis (PHA) — in accordance with the Hazardous Industry Planning Advisory Paper No. 6 — Guidelines for Hazard Analysis and Multi-level Risk Assessment, and details of fire/emergency measures and procedures.	Section 4.4 Chapter 4 Statutory context Section 14.3 and 14.4 Chapter 14 Hazard and risk Technical report J Preliminary hazard analysis
Air Quality	
Address air quality and human health impacts by way of the following: • a quantitative assessment of the potential air quality and odour impacts of the development on surrounding landowners, the locality in general and sensitive receptors under the relevant Environment Protection Authority guidelines.	Section 8.3 Chapter 8 Air quality and odour Section 9.3 Chapter 9 Human health risk Section 14.4 Chapter 14 Hazard and risk Section 7 Technical report A Air quality and odour impact assessment Section 3.2.15 Technical report J Preliminary hazard analysis Section 5 Technical report B Human health risk assessment
• a description of construction and operational impacts, including air emissions from the transport of materials.	Section 8.3 Chapter 8 Air quality and odour Section 6 and 7 Technical report A Air quality and odour impact assessment
• a human health risk assessment covering the inhalation of criteria pollutants and exposure (from all pathways, i.e. inhalation, ingestion and dermal) to specific air toxics.	Section 9.3 Chapter 9 Human health risk

Assessment Requirements	Reference in EIS and Technical reports
	Section 5 Technical report B Human health risk assessment
• details of any pollution control equipment and other impact mitigation measures for fugitive and point source emissions.	Section 3.4 Chapter 3 Proposal description Section 5.10 Chapter 5 EfW policy Section 8.4 Chapter 8 Air quality and odour Section 8 Technical report A Air quality and odour impact assessment Section 3 and 4 Technical report D Best available techniques assessment Section 3.2.15 Technical report J Preliminary hazard analysis
• a demonstration of how the facility would be operated in accordance with world best practice measures to manage toxic air emissions, with consideration of the European Union's Waste Incineration Directive 2000 and the Environment Protection Authority's policy statement NSW Energy from Waste.	Section 3.1 Chapter 3 Proposal description Section 5.2, 5.8 and 5.10 Chapter 5 EfW policy Section 8 Technical report A Air quality and odour impact assessment Section 4 Technical report D Best available techniques assessment
• an examination of best practice management measures for the mitigation of toxic air emissions and their incorporation into the design and control features of the facility	Section 8 Technical report A Air quality and odour impact assessment Section 4Technical report D Best available techniques assessment
• details of the proposed technology to be utilised and conclusive demonstration that it is technically fit for purpose and that it represents world best practice	Section 3.4 Chapter 3 Proposal description Section 5.2, 5.8 and 5.10 Chapter 5 EfW policy Section 3 and 4Technical report D Best available techniques assessment

Assessment Requirements	Reference in EIS and Technical reports
	Section 8 Technical report A Air quality and odour impact assessment
• detail contingency plans for any potential incidents or equipment failure during the operation of the project.	Section 14.6 Chapter 14 Hazard and risk Appendix B Technical report J Preliminary hazard analysis Section 8 Technical report A Air quality and odour impact assessment
The applicant should demonstrate how they will broadcast real time emission testing data online, giving the general public the ability to view and monitor the daily emissions from the facility.	Section 5.2 Chapter 5 EfW policy Section 8.3 Technical report A Air quality and odour impact assessment
Obtain accurate air quality baseline data within a 1 km radius of the site.	Section 5 Technical report A Air quality and odour impact assessment
Soil and Water	
A detailed assessment of potential soil, surface and groundwater impacts.	Section 11.3 Chapter 11 Soils and water Section 12.3 Chapter 12 Hydrology and flooding Section 4 Technical report F Soils and water Assessment Section 4 Technical report H Hydrology and flooding assessment
A Stormwater Management Strategy is to be provided for the site. The Strategy is to address detention for all storm events from 2 to 100 years ARI to pre development discharges, stormwater quality using Part J of Council's DCP 2015, water conservation achieving a minimum of 80% of non-potable demand to be met through rainwater or alternative non-potable sources, and assessment and reduction of the stream erosion index.	Section 12.3 Chapter 12 Hydrology and flooding Section 4.2 Technical report H Hydrology and flooding assessment

Assessment Requirements	Reference in EIS and Technical reports
The Stormwater Management Strategy is to also consider flows from outside the immediate construction area of the proposed facility and how these flows (including road flows) are to be conveyed to the creek system and adverse impacts mitigated.	Section 12.3 Chapter 12 Hydrology and flooding Section 4.2 Technical report H Hydrology and flooding assessment
Preparation of a Vegetation Management Plan and restoration of the riparian corridor over the full extent of the site.	Appendix G Vegetation management plan (Technical report Q Biodiversity development assessment report)
A water balance assessment for the site, detailing water sources, water demand and consumption, water recycling, the quantity and quality of wastewater streams and the impact of any water and wastewater release from the site on surface and groundwater.	Section 12.3 Chapter 12 Hydrology and flooding Section 4.2 Technical report H Hydrology and flooding assessment
Management of wastewater including contaminated surface runoff.	Section 12.3 and 12.4 Chapter 12 Hydrology and flooding Section 4 and 5 Technical report H Hydrology and flooding assessment
Provide an Integrated Water Management Plan for the site.	Section 4.2 Technical report H Hydrology and flooding assessment
Detail spill containment and bunding.	Section 12.3 Chapter 12 Hydrology and flooding Section 4 Technical report H Hydrology and flooding assessment
Relevant Policies and Guidelines: • Flooding and on-site detention - Council's Engineering Guide for Development 2005 (as amended). • Water quality and water conservation - WSUD Developer's Handbook Part 4.	Section 3.1.2 Technical report H Hydrology and flooding assessment

Assessment Requirements	Reference in EIS and Technical reports
Noise	
Identify the main noise generating sources and activities at all stages of construction, and any noise sources during operation including noise associated with vehicle movements, standby generators, fans and pumps (noise levels shall take into consideration the effect of wind speed and temperature). Outline measures to minimise and mitigate the potential noise impacts on occupiers of surrounding land.	Section 13.3 Chapter 13 Noise and vibration Section 4, 5, 6 and 7 Technical report I Noise and vibration impact assessment
Relevant policies and guidelines are: • NSW Industrial Noise Policy (EPA) • Interim Construction Noise Guideline (DECC) • Assessing Vibration: A Technical Guideline 2006.	Section 13.1 Chapter 13 Noise and vibration Sections 4.1, 7.1 and 7.2 Technical report I Noise and vibration impact assessment
Provide an acoustic report to be prepared by a consultant that is a member of the Association of Australian Acoustical Consultants (AAAC) that assesses the noise levels of proposed operations of the facility. The report will consider the NSW Industrial Noise Policy, published by the NSW Office of Environment and Heritage. As the facility is proposed to operate 24 hours, 7 days a week, the sleep disturbance criteria is to be considered. The report is to provide recommendations to mitigate noise pollution. Matters to be considered in the report include, but are not limited to, potential unexpected noise from changes in feed stock or possible contamination of the waste which may react when heated. It is recommended that a 6 month post commissioning report be considered as part of this assessment.	Technical report I Noise and vibration impact assessment
Transport and Accessibility (construction)	
Detail access arrangements at all stages of construction and measures to mitigate any associated pedestrian, cycleway or traffic impacts.	Section 15.3 Chapter 15 Traffic and transport Appendix A Technical report K Traffic and transport assessment
Transport and Accessibility (operational)	
A traffic report should be submitted that covers traffic movements in and out of the site and its impact on the existing and future road network.	Section 15.3 Chapter 15 Traffic and transport Section 4 Technical report K Traffic and transport assessment

Assessment Requirements	Reference in EIS and Technical reports
Detail access arrangements at all stages of operation and measures to mitigate any associated traffic impacts.	Section 15.3 Chapter 15 Traffic and transport Section 4 Technical report K Traffic and transport assessment
Demonstrate how users of the development will be able to make travel choices that support the achievement of State Plan targets.	Section 15.3 Chapter 15 Traffic and transport Section 5 Technical report K Traffic and transport assessment
Detail existing pedestrian and cycle movements within the vicinity of the site and determine the adequacy of the proposal to meet the likely future demand for increased public transport and pedestrian and cycle access.	Section 15.2 Chapter 15 Traffic and transport Section 2 Technical report K Traffic and transport assessment
Describe the measures to be implemented to promote sustainable means of transport, including public transport usage and pedestrian and bicycle linkages, in addition to addressing the potential for implementing a location specific sustainable travel plan.	Section 15.3 and 15.4 Chapter 15 Traffic and transport Section 5.2 Technical report K Traffic and transport assessment
Detail the proposed transportation of hazardous goods from the plant.	Section 14.3 Chapter 14 Hazard and Risk Section 3.2.16 the Technical report J Preliminary Hazard Analysis
Demonstrate the provision of sufficient on-site car parking having regard to the availability of public transport.	Section 15.3 Chapter 15 Traffic and transport Section 4.4 Technical report K Traffic and transport assessment
Estimate the total daily and peak hour trips generated by the proposed development, including accurate details of the current and future daily vehicle movements. Assess the impacts of the traffic generated on the local road network, including intersection capacity and any potential need for upgrading or road works Relevant policies and guidelines are: • RMS Guide to Traffic Generating Development • EIS Guidelines for Road and Related Facilities (DPIE) • RMS Walking and Cycling Program Guidelines.	Section 15.3 Chapter 15 Traffic and transport Section 4.1 Technical report K Traffic and transport assessment

Assessment Requirements	Reference in EIS and Technical reports
Amenity	
Provide information detailing the impact on overshadowing, noise, visual privacy, view loss and wind impacts. A high level of environmental amenity must be demonstrated.	Section 13.3 Chapter 13 Noise and vibration Section 16.3 Chapter 16 Landscape and visual Section 7 and 8 Technical report L Landscape and visual impact assessment Section 17.3 Chapter 17 Social Section 4, 5, 6 and 7 Technical report I Noise and vibration impact assessment Section 5 Technical report M Social impact assessment
Demonstrate the community benefits of the facility, including details of similar facilities which are operating around the world including testimonies from their regulating offices and contact details.	Section 4.5 Appendix F Community and stakeholder engagement report
Sediment, erosion and dust controls (construction and excavation)	
Identify measures and procedures to minimise and manage the generation and off- site transmission of sediment, dust and fine particles, including: • A description of the water demands of the facility and a breakdown of water supply. • A description of the measures to minimise water use. • A detailed water balance. • A description of proposed erosion and sediment controls during the construction phase. • A description of the surface and stormwater management system, including on site detention, and measures to treat or reuse water. • An assessment of potential surface and groundwater impacts associated with the development, including the details of impact mitigation, management and monitoring measures. • An assessment of any potential existing soil contamination.	Section 11.4 Chapter 11 Soils and water Section 5 Technical report F Soils and water assessment
Relevant Policies and Guidelines: • Managing Urban Stormwater - Soils & Construction Volume 1 2004 (Landcom)	Section 2.1 Technical report F Soils and water assessment

Assessment Requirements	Reference in EIS and Technical reports
• Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (EPA) • Blacktown City Council, Engineering Guide for Development 2005	Section 3.1.2 Technical report H Hydrology and flooding assessment Section 4 Technical report A Air quality and odour impact assessment
Built form and urban design	
Address the height, bulk and scale of the proposed development within the context of the locality.	Section 16.3 Chapter 16 Landscape and visual Section 6 Technical report L Landscape and visual impact assessment Appendix B Architecture and landscape design strategy report
Assess the visual impact of the proposed building's height, scale, signage and lighting, particularly from nearby public receivers and significant vantage points of the broader public domain.	Section 16.3 Chapter 16 Landscape and visual Section 6, 7 and 8 Technical report L Landscape and visual impact assessment
Consideration of any impact on flight paths.	Section 4.5.4 Chapter 4 Statutory context Section 14.3 Chapter 14 Hazard and risk Section 3.2.14 Technical report J Preliminary hazard analysis
Details of design measures to ensure the project has a very high design quality and is architecturally designed.	Section 16.4 Chapter 16 Landscape and visual Appendix B Architecture and landscape design strategy report Section 6 and 7 Technical report L Landscape and visual impact assessment
Details of materials and finishes.	Appendix B Architecture and landscape design strategy report
Details about any bulk earthworks, including the extent of cut and fill works, provision of retaining walls or importation of fill material.	Section 3.2 Chapter 3 Proposal description Section 10.3 Chapter 10 Waste management

Assessment Requirements	Reference in EIS and Technical reports
Submission of a landscape strategy detailing screen planting and fencing.	Appendix B Architecture and landscape design strategy report Appendix G Vegetation management plan Technical report Q Biodiversity development assessment report
A detailed photomontage based analysis of the visual impacts of the development.	Section 16.3 Chapter 16 Landscape and visual Section 7 Technical report L Landscape and visual impact assessment
Flora and Fauna	
Undertake a fauna and flora survey of the site in accordance with OEH Threatened Species Survey and Assessment Guidelines.	Section 21.2 Chapter 21 Biodiversity Section 4 Technical report Q Biodiversity development assessment report
Address impacts on flora and fauna, including threatened species, populations and endangered ecological communities and their habitats and steps taken to mitigate any identified impacts to protect the environment.	Section 21.3 Chapter 21 Biodiversity Section 7 Technical report Q Biodiversity development assessment report
Any impacts on threatened species, populations and endangered ecological communities that cannot be avoided or mitigated must be adequately offset in accordance with OEH principles for the use of biodiversity offsets in NSW.	Section 21.3 and 21.4 Chapter 21 Biodiversity Section 8 Technical report Q Biodiversity development assessment report
Aboriginal Heritage	
Address Aboriginal heritage in accordance with the Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation and Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010. Any impacts to Aboriginal cultural heritage as a result of the proposal must be adequately mitigated.	Section 19.2, 19.3 and 19.4 Chapter 19 Heritage Sections 5, 7, 8 and 9 Technical report O Aboriginal cultural heritage assessment

Assessment Requirements	Reference in EIS and Technical reports
European Heritage	
Address European heritage through a European heritage assessment with the primary purpose of recording and identifying any potential heritage issues on the site and archaeological protocols for ground works.	Section 19.3 Chapter 19 Heritage Technical report O1 Aboriginal and non-Aboriginal heritage assessment
Staging	
Provide details regarding the staging of the proposed development (if applicable).	Section 3.2.1 Chapter 3 Proposal description
EPA recommendations for SEARs for the Western Sydney Energy and Resource Recovery Centre (SSD 10395)	
Soils, Contamination and Construction	
Provide any details including site history that are needed to describe the existing situation in terms of soil types and properties and the potential for soil contamination. Include appropriate investigation in accordance with the *Managing Land Contamination, Planning Guidelines SEPP 55 — Remediation of Land.*	Section 11.2 Chapter 11 Soils and water Section 3 Technical report F Soils and water Technical report G Detailed site investigation Technical report G2 Remediation action plan Technical report G3 Due diligence contamination investigation
Identify any likely impacts resulting from the construction or operation of the proposal, including the likelihood of: • Disturbing any existing contaminated soil. • Contamination of soil by operation of the activity. • Subsidence or instability • Soil erosion • Ground water interaction • Disturbing acid sulfate or potential acid sulfate soils.	Section 11.3 Chapter 11 Soils and water Section 4 Technical report F Soils and water assessment
Outline construction works including: • Actions to address any existing soil contamination. • Any earthworks or site clearing. • Re-use and disposal of cleared material (including use of spoil on-site).	Section 3.2 Chapter 3 Proposal description Section 11.4 Chapter 11 Soils and water Section 13.4 Chapter 13 Noise and vibration

Assessment Requirements	Reference in EIS and Technical reports
• Construction timetable and staging; hours of construction; proposed construction methods. • Environment protection measures, including noise mitigation measures, dust control measures and erosion and sediment control measures. • Include a site diagram showing the site layout and location of environmental controls.	Section 4 and 5 Technical report F Soils and water assessment Technical report G2 Remediation action plan Section 7 Technical report I Noise and vibration impact assessment
Provide details of spoil disposal with particular attention to: • The quantity of spoil material likely to be generated; • Proposed strategies for the handling, stockpiling, reuse/recycling and disposal of spoil; and • Identification of the history of spoil material and whether there is any likelihood of contaminated material, and if so, measures for the management of any contaminated material.	Section 3.2 Chapter 3 Proposal description Section 11.4 Chapter 11 Soils and water Section 4 and 5 Technical report F Soils and water assessment Technical report G Detailed site investigation Technical report G2 Remediation action plan Technical report G3 Due diligence contamination investigation
Describe and assess the effectiveness or adequacy of any soil management and mitigation measures during construction and operation of the proposal including: • Erosion and sediment control measures directed at minimising disturbance of land, minimising water flow through the site and filtering, trapping or detaining sediment with reference to *Managing Urban Storm water. Soils and Construction* (Landcom 2004). Also include measures to maintain and monitor controls as well as rehabilitation strategies. • Proposals for site remediation — see *Managing Land Contamination, Planning Guidelines SEPP 55 Remediation of Land* (Department of Urban Affairs and Planning and Environment Protection Authority, 1998). • Proposals for the management of potential acid sulfate soils — see *Acid Sulfate Soil Manual* (Acid Sulfate Soil Advisory Committee 1998) and *Acid Sulfate Soils Assessment Guidelines* (Acid Sulfate Soil Advisory Committee 1998).	Section 11.4 Chapter 11 Soils and water Section 4 and 5 Technical report F Soils and water assessment Technical report G2 Remediation action plan
Detail contingency plans for any potential incidents during the construction of the facility that may result in environmental harm.	Section 14.6 Chapter 14 Hazard and risk Appendix B Technical report J Preliminary hazard analysis

Assessment Requirements	Reference in EIS and Technical reports
Waste Management	
Demonstrate how the proposal would operate as an energy from waste facility in accordance with the *NSW Energy from Waste Policy Statement.*	Section 5.2 of Chapter 5 EfW policy
Demonstrate that the waste used as feedstock in the waste to energy plant would be the residual from a resource recovery process that maximises the recovery of material in accordance with the EPA's *NSW Energy from Waste Policy Statement.*	Section 3 Technical report C Waste and resource management technical report Section 5.4 and 5.6 Chapter 5 EfW policy
Describe the classes and quantities of waste that would be thermally treated at the facility, including proposed sources, quantities, composition and classes of waste with reference to the data sets relied upon in making these determinations. Note, all waste must be classified in accordance with the EPA's *Waste Classification Guidelines.*	Section 3 Technical report C Waste and resource management technical report
Describe the procedures that would be implemented to control the residual waste inputs to the plant, including contingency measures that would be implemented if inappropriate materials are identified.	Section 3.4 Chapter 3 Proposal description Section 3.8 Technical report C Waste and resource management technical report
Include a detailed site plan(s) identifying all operational areas and a detailed description of the waste processing procedures at the facility, including the types of pollution which may result from the storage and processing of that waste, and mitigation measures for managing any such impacts.	Section 3.3 Chapter 3 Proposal description
Demonstrate that all waste handling activities, including receiving, sorting, processing, sampling, quarantine, storage, and loading will be conducted in an enclosed building. No waste, including finished products, may be stored outside.	Section 3.4 Chapter 3 Proposal description
Provide details of the processing capacity of the plant including typical, maximal and minimal rates of processing.	Section 3.4 Chapter 3 Proposal description
Provide the maximum annual throughput of waste and the maximum volume of waste to be stored at the premises at any one time.	Section 3.4 Chapter 3 Proposal description
Detail how the proponent will meet the EPA's record keeping and reporting requirements, including weighing material in and out of the premises (refer to the EPA's Waste Levy Guidelines for more information — available at http://www.epa.nsw.gov.au/your-environment/waste/waste-levy).	Section 4.2 Technical report C Waste and resource management technical report

Assessment Requirements	Reference in EIS and Technical reports
Include a list and description, including quantities, of the types of materials (solid liquid and gaseous) or finished products (if any) to be produced and their intended fate.	Section 5.11 Chapter 5 EfW policy Table 10.2 Chapter 10 Waste management Section 5 Technical report C Waste and resource management technical report
Describe the procedures to be implemented for the management of all waste materials produced from the waste to energy facility (solid liquid and gaseous).	Table 10.2 Chapter 10 Waste management Section 5 Technical report C Waste and resource management technical report
Include details of all procedures and protocols to be implemented to ensure that any waste accepted to and leaving from the site is transported and disposed of lawfully and does not pose a risk to human health or the environment.	Section 5.8 and 5.11 Chapter 5 EfW policy Section 10.3 and 10.4 Chapter 10 Waste management Section 3 Technical report C Waste and resource management technical report
Demonstrate that any waste material produced from the energy from waste facility for land application is fit-for-purpose and poses minimal risk of harm to the environment in order to meet the requirements for consideration of a resource recovery order and/or exemption by the EPA under Clause 91 of the *Protection of the Environment Operations (Waste) Regulation 2014.* The EIS should list each intended order and exemption by name, and set out details as to how the proponent will meet each of these.	Section 5 Technical report C Waste and resource management technical report
Identify 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 2.5 Chapter 2 Strategic context Section 5.3, 5.4 and 5.6 Chapter 5 EfW policy
Air Quality	
The EIS for the proposal should include an Air Quality Impact Assessment (AQIA), prepared in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales 2016.* This AQIA should: Identify all potential discharges of fugitive and point source emissions of pollutants and odour for all stages of the proposal. All processes that could result in air emissions must be identified and described. Sufficient detail to accurately communicate the characteristics and quantity of all emissions must be provided.	Chapter 8 Air quality and odour Technical report A Air quality and odour impact assessment

Assessment Requirements	Reference in EIS and Technical reports
Describe the receiving environment in detail. The proposal must be contextualised within the receiving environment (local, regional and inter-regional as appropriate). The description must include but need not be limited to: • meteorology and climate; • topography; • surrounding land-use • identified sensitive receptors; and • ambient air quality.	Section 8.2 Chapter 8 Air quality and odour Sections 3.1 and 5 Technical report A Air quality and odour impact assessment
Identify comparable facilities within the airshed and consider the cumulative impact of air emissions from these facilities.	Section 23.2 Chapter 23 Cumulative impacts Sections 6 and 7 Technical report A Air quality and odour impact assessment
Assess all risks to the environment, human health and amenity associated with emissions of air pollutants, including odour, from all stages of the proposal.	Section 8.3 Chapter 8 Air quality and odour Section 9.3 Chapter 9 Human health risk Sections 6 and 7 Technical report A Air quality and odour impact assessment Section 23.2 Chapter 23 Cumulative impacts Section 5 Technical report B Human health risk assessment
Justify the level of assessment undertaken on the basis of risk factors, including but not limited to: • proposal location; • characteristics of the receiving environment; and • type and quantity of pollutants emitted.	Section 8.2 and 8.3 Chapter 8 Air quality and odour Section 6 Technical report A Air quality and odour impact assessment
Include a consideration of 'worst case' emission scenarios and impacts at proposed emission limits including consideration of what emissions may be released during a trip or emergency shut down.	Sections 6.4 and 7.4 Technical report A Air quality and odour impact assessment
Account for cumulative impacts associated with existing emission sources as well as any currently approved developments linked to the receiving environment.	Section 23.2 Chapter 23 Cumulative impacts Section 7.2 Technical report A Air quality and odour impact assessment

Assessment Requirements	Reference in EIS and Technical reports
Include air dispersion modelling conducted in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales 2016.*	Section 8.3 Chapter 8 Air quality and odour Section 6 Technical report A Air quality and odour impact assessment
Demonstrate the proposal's ability to comply with the relevant regulatory framework, specifically the *Protection of the Environment Operations (POEO) Act (1997)* and the *POEO (Clean Air) Regulation (2010).*	Sections 8.3 Chapter 8 Air quality and odour Section 6 Technical report A Air quality and odour impact assessment
Detail emission control techniques/ practices, including emission sampling and monitoring, that will be employed by the proposal, and benchmark these techniques/ practices against best practice emission control and management.	Section 3.4 Chapter 3 Proposal description Section 5.10 Chapter 5 EfW policy Section 8.4 Chapter 8 Air quality and odour Section 8 Technical report A Air quality and odour impact assessment Section 3 and 4 Technical report D: Best available techniques assessment
Human Health Risk Assessment	
A Human Health Risk Assessment (HHRA) undertaken in conjunction with the AQIA and in accordance with *Environmental Health Risk Assessment: Guidelines for assessing human health risks from environmental hazards* (enHealth) that includes: • An examination of best practice management measures for the mitigation of toxic air emissions.	Technical report B Human health risk assessment
• Details of the proposed technology and a demonstration that it is technically fit for purpose.	Section 3.4 Chapter 3 Proposal description Section 3 and 4 Technical report D: Best available techniques assessment
• The inhalation of criteria pollutants and exposure from all pathways i.e., inhalation, ingestion and dermal to specific air toxics.	Section 9.3 Chapter 9 Human health risk Section 5 Technical report B Human health risk assessment

Assessment Requirements	Reference in EIS and Technical reports
• Details of any pollution control equipment and other impact mitigation measures for fugitive and point source emissions.	Section 3.4 Chapter 3 Proposal description Section 5.6, 5.8, 5.9 and 5.10 Chapter 5 EfW policy Section 3 and 4 Technical report D: Best available techniques assessment Section 8 Technical report A Air quality and odour impact assessment
• A demonstration of how the waste to energy facility would be operated in accordance with best practice measures to manage toxic air emissions with consideration of the *European Union's Waste Incineration Directive 2000* and *the NSW Energy from Waste Policy Statement.*	Section 3.1 and 3.4.14 Chapter 3 proposal description Section 5.2, 5.8 and 5.10 Chapter 5 EfW policy Section 3 and 4 Technical report D: Best available techniques assessment
• Details of the proposed management and monitoring measures.	Section 8.4 Chapter 8 Air quality and odour Section 9.4 Chapter 9 Human health risk Section 8 Technical report A Air quality and odour impact assessment Section 7 Technical report B Human health risk assessment
Water	
Describe the catchment including proximity of the development to any waterways and provide an assessment of their sensitivity/significance from a public health, ecological and/or economic perspective. The Water Quality and River Flow Objectives on the website: http://www.environment.nsw.gov.au/ieo/index.htm should be used to identify the agreed environmental values and human uses for any affected waterways.	Section 9.3 Chapter 9 Human health risk Section 12.2 Chapter 12 Hydrology and flooding Section 5.4.4 Technical report B Human health risk assessment Section 2 Technical report H Hydrology and flooding assessment

Assessment Requirements	Reference in EIS and Technical reports
Identify all surface water features including water courses, wetlands and floodplains transacted by or adjacent to the proposed development.	Section 12.2 Chapter 12 Hydrology and flooding Section 2 Technical report H Hydrology and flooding assessment
Provide details of the project that are necessary for predicting and assessing impacts to waters including: • Outline site layout, demonstrating efforts to avoid proximity to water resources (especially for activities with significant potential impacts e.g. effluent ponds) and showing potential areas of modification of contours, drainage works and associated infrastructure; land-forming and excavations; working capacity of structures; and water resource requirements of the proposal.	Section 11.3 and 11.4 Chapter 11 Soils and water Section 12.3 and 12.4 Chapter 12 Hydrology and flooding Section 4 Technical report F Soils and water assessment Section 4 Technical report H Hydrology and flooding assessment
• Assessment of the potential impact of the development on all identified water features, tributaries and riparian areas.	Section 11.3 Chapter 11 Soils and water Section 12.3 Chapter 12 Hydrology and flooding Section 4 Technical report F Soils and water assessment Section 4 Technical report H Hydrology and flooding assessment
• The quantity and physio-chemical properties of all potential water pollutants and the risks they pose to the environment and human health, including the risks they pose to Water Quality Objectives in the ambient waters (as defined on http://www.environment.nsw.gov.au/ieo/index.htm, using technic at criteria derived from *the Australian and New Zealand Guidelines for Fresh and Marine Water Quality,* ANZECC 2000).	Section 12.2 and 12.3 Chapter 12 Hydrology and flooding Section 2 and 4 Technical report H Hydrology and flooding assessment
• Water management system including all potential sources of water pollution, proposals for re-use, treatment etc., emission levels of any wastewater discharged, discharge points, summary of options explored to avoid a discharge, reduce its frequency or reduce its impacts, and rationale for selection of option to discharge.	Section 12.3 and 12.4 Chapter 12 Hydrology and flooding Section 4 and 5 Technical report H Hydrology and flooding assessment

Assessment Requirements	Reference in EIS and Technical reports
• Site diagram of the finished facility identifying surface water flows and discharge pathways including the location of discharge monitoring points.	Section 12.3 Chapter 12 Hydrology and flooding Section 4 Technical report H Hydrology and flooding assessment
• Where a licensed discharge is proposed, provide the rationale as to why it cannot be avoided through application of a reasonable level of performance, using available technology, management practice and industry guidelines.	Section 4 Technical report H Hydrology and flooding assessment
• Where a licensed discharge is proposed, provide the rationale as to why it represents the best environmental outcome and what measures can be taken to reduce its environmental impact.	Section 4 Technical report H Hydrology and flooding assessment
Outline how total water cycle considerations are to be addressed showing total water balances for the development (with the objective of minimising demands and impacts on water resources). Include water requirements (quantity, quality and source(s)) and proposed storm and wastewater disposal, including type, volumes, proposed treatment and management methods and re-use options.	Section 12.3 and 12.4 Chapter 12 Hydrology and flooding Section 4 Technical report H Hydrology and flooding assessment
Noise and Vibration	
Identify any noise sensitive locations likely to be affected by activities at the site, such as residential properties, schools, churches, and hospitals. Typically the location of any noise sensitive locations in relation to the site should be included on a map of the locality.	Section 13.2 Chapter 13 Noise and vibration Section 3 Technical report I Noise and vibration impact assessment
Construction noise associated with the proposed development should be assessed using the *Interim Construction Noise Guideline* (DECC, 2009).	Section 13.3 Chapter 13 Noise and vibration Section 7 Technical report I Noise and vibration impact assessment
Operational noise from all industrial activities to be undertaken on the premises should be assessed using the guidelines contained in the *Noise Policy for Industry* (EPA, 2017). This assessment should be undertaken for all proposed operational times (i.e. day, evening and night). The assessment must include detail of all noise management, mitigation and monitoring measures.	Section 13.3 and 13.4 Chapter 13 Noise and vibration Section 4 Technical report I Noise and vibration impact assessment

Assessment Requirements	Reference in EIS and Technical reports
Noise on public roads from increased road traffic generated by land use developments should be assessed using the guidelines contained in the *NSW Road Noise Policy* (DECCW, 2011). http://www.epa.nsw.gov.au/resources/noise/2011236nswroadnoisepolicy.pdf	Section 13.3 Chapter 13 Noise and vibration Section 5 Technical report I Noise and vibration impact assessment
Vibration from all activities (including construction and operation) to be undertaken on the premises should be assessed using the guidelines contained in the *Assessing Vibration: a technical guideline* (DEC, 2006).	Section 13.3 Chapter 13 Noise and vibration Section 6 and 7 Technical report I Noise and vibration impact assessment
Hazards and Risk	
Where preliminary screening indicate that the project is potentially hazardous provide a Preliminary Hazard Analysis (PHA) in accordance with *Hazardous Industry Planning Advisory Paper No. 6 — Guidelines for Hazard Analysis* and *Multi-Level Risk Assessment* and or *No 33 Hazardous and Offensive Development and Applying SEPP 33 (DoP, 2011)* with a clear indication of class, quality and location of all dangerous goods and hazardous material associated with the development.	Technical report J Preliminary hazard analysis
Provide details of procedures for the assessment, handling, storage, transport and disposal of all hazardous and dangerous materials used, stored, processed or disposed of at the site, in addition to the requirements for liquid and non-liquid wastes.	Section 14.3 and 14.4 Chapter 14 Hazard and risk Section 2 and 3 of Technical report J Preliminary hazard analysis
The containment of liquids shall be in accordance with EPA's guidelines section 'Bunding and Spill Management' at http://www.epa.nsw.gov.au/mao/bundinqspiII.htm and the most recent versions of the Australian Standards referred to in the Guidelines. Containment should be designed for no-discharge.	Section 14.3 and 14.6 Chapter 14 Hazard and risk Section 3.2.11 and 3.2.17 Technical report J Preliminary hazard analysis
Detail fire/emergency measures and procedures.	Section 3.6 Chapter 3 Proposal description
Detail contingency plans for any potential incidents or equipment failure during the operation of the facility that may result in environmental harm.	Section 14.6 Chapter 14 Hazard and risk Appendix B Technical report J Preliminary hazard analysis

Assessment Requirements	Reference in EIS and Technical reports
Fairfield City Council SEARs	
General Assessment Requirements	
The existing access road to the site shall be upgraded to accommodate the volume and types of vehicles proposed to service the development. The relevant authorities shall be consulted in regard to the upgrade to the access road.	Section 15.3 Chapter 15 Traffic and transport Section 4 Technical report K Traffic and transport assessment
Adequate on-site parking shall be provided for staff and visitors. Also, on- site parking to be provided for heavy vehicles.	Section 15.3 Chapter 15 Traffic and transport Section 4 Technical report K Traffic and transport assessment
No off-street parking and queuing of waste delivery vehicles onto the public road will be permitted.	Section 15.3 Chapter 15 Traffic and transport Section 4 Technical report K Traffic and transport assessment
The available clear height from the access road off Wallgrove Road and M7 needs to be checked in regard to permitting use of heavy vehicles to service the subject development.	Section 15.2 and 15.3 Chapter 15 Traffic and transport Section 2.1 Technical report K Traffic and transport assessment
Approval shall be obtained from the Roads and Maritime Services and relevant Councils in regard to servicing the development by B-Double vehicles.	RMS (TfNSW) have been consulted on the proposal throughout the development of the EIS
DPIE Water and the Natural Resources Access Regulator (NRAR)	
General Assessment Requirements	
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 12.3 Chapter 12 Hydrology and flooding Section 4 Technical report H Hydrology and flooding assessment Section 20.3 Chapter 20 Utilities and services

Assessment Requirements	Reference in EIS and Technical reports
A detailed and consolidated site water balance.	Section 12.3 Chapter 12 Hydrology and flooding Section 4.2.2 Technical report H Hydrology and flooding 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.	Sections 11.3 and 11.4 Chapter 11 Soils and water Sections 12.3 and 12.4 Chapter 12 Hydrology and flooding Section 4 Technical report F Soils and water assessment Section 4 Technical report H Hydrology and flooding assessment
Proposed surface and groundwater monitoring activities and methodologies.	Sections 11.4 Chapter 11 Soils and water Sections 12.3 and 12.4 Chapter 12 Hydrology and flooding Section 5 Technical report F Soils and water assessment Section 5 Technical report H Hydrology and flooding assessment
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).	Section 2 Technical report F Soils and water assessment Section 12.3 Chapter 12 Hydrology and flooding Section 3.1 Technical report H Hydrology and flooding assessment

Assessment Requirements	Reference in EIS and Technical reports
NSW Health SEARs	
Technical Detail	
Detailed description of plant design and treatment technology with a comparison to the European reference facilities used in air quality modelling.	Section 3.4 Chapter 3 Proposal description Section 5.9 and 5.10 Chapter 5 EfW policy
Description of how plant fits with current best available technologies for stack emission controls	Section 3.4 Chapter 3 Proposal description Section 4 Technical report D: Best available techniques assessment
Air Quality and Odour	
The inclusion of a clear and detailed comparison between the proposed waste feedstock for the Western Sydney Energy and Resource Recovery Centre (WSERRC) and the chosen European reference facilities.	Section 5.9 Chapter 5 EfW policy
Clear information on the expected air quality and odour emissions from the proposed development based on the European reference facility and compliance with the relevant NSW/Australian and European Union (EU) emission controls.	Section 8.3 Chapter 8 Air quality and odour Section 5.9 and 5.10 Chapter 5 EfW policy Section 6 Technical report A Air quality and odour impact assessment
Description of local meteorological and topographical conditions used in air dispersion modelling in the calculation of the local ground level impacts on the surrounding community and facilities.	Section 8.2 Chapter 8 Air quality and odour Sections 3.1, 5 and 6 Technical report A Air quality and odour impact assessment
Waste Classification/management	
Include a detailed description of the process of waste classification and onsite management of waste feedstock (including out of specification waste) entering the plant to ensure that the actual feedstock consistently meets the predicted feedstock on which the air quality modelling and the health risk assessment have been based.	Section 5.8 Chapter 5 EfW policy Section 3 Technical report C Waste and resource management technical report
Health Risk Assessment	
Conduct in accordance with Environmental Health Risk Assessment Guidelines for Assessing Health Risks from Environmental Hazards and Exposure Factor Guidelines (enHealth).	Technical report B Human health risk assessment

Assessment Requirements	Reference in EIS and Technical reports
Include appropriate justified and realistic modelled scenarios on sensitive receivers including local residential areas, school and child care centres, recreational users of WS parklands, industry sites, and Prospect Reservoir and water treatment facilities (and any other identified sensitive receivers).	Section 4 Technical report B Human health risk assessment
RMS SEARs	
General Assessment Requirements	
Roads and Maritime 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 include: • Wallgrove Road / Unnamed Road (also known as Austral Bricks Road) The applicant is advised that this intersection is being upgraded to a signalised intersection and as such the applicant is to include the signalised intersection in their assessment.	Section 15.3 Chapter 15 Traffic and Transport Section 4 Technical report K Traffic and transport assessment
Details of the proposed accesses and the parking provisions associated with the proposed development including compliance with the requirements of the relevant Australian Standards (ie: turn paths, sight distance requirements, aisle widths, etc) and relevant parking codes. Swept path plans need to be provided.	Section 15.3 Chapter 15 Traffic and transport Section 4.2 and 4.4 Technical report K Traffic and transport assessment
Details of service vehicle movements (including vehicle type and likely arrival and departure times).	Section 15.3 Chapter 15 Traffic and transport Section 4 Technical report K Traffic and transport assessment
Roads and Maritime requires the environmental assessment report 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 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 transport.	Section 15.3 and 15.4 Chapter 15 Traffic and Transport Section 5 Technical report K Traffic and transport assessment

Assessment Requirements	Reference in EIS and Technical reports
Sydney Water SEARs	
Water-Related Infrastructure Requirements	
The proponent of the development should determine service demands following servicing investigations and demonstrate that satisfactory arrangements for drinking water, wastewater, and recycled water (if required) services have been made.	Section 20.3 Chapter 20 Utilities and services Section 4 Technical report P Utilities and services assessment
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 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.	Section 4 Technical report P Utilities and services assessment Section 21.4 Chapter 21 Biodiversity
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.	Section 12.3 and 12.4 Chapter 12 Hydrology and flooding Section 4 and 5 Technical report H Hydrology and flooding assessment Section 20.3 and 20.4 Chapter 20 Utilities and services Sections 4 of Technical report P Utilities and services assessment
Integrated Water Cycle Management	
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.	Sections 4 Technical report P Utilities and services assessment

Assessment Requirements	Reference in EIS and Technical reports
Transport for NSW SEARs	
General Assessment Requirements	
The relevant documents have been reviewed and TfNSW advises that the following should be addressed within the Environmental Impact Statement (EIS): • **Consideration of the NSW Government's Freights and Ports Plan 2018 – 2023.**	Section 3 Technical report K Traffic and transport assessment
A qualitative Traffic Impact Assessment which details all daily and peak traffic and transport movements likely to be generated during the construction and operation of the development.	Section 15.3 Chapter 15 Traffic and transport Section 4 Technical report K Traffic and transport assessment
Details of the current daily and peak hour vehicle, public transport and pedestrian and bicycle movements and existing traffic and transport facilities provided on the road network located adjacent to the proposed development.	Section 15.3 Chapter 15 Traffic and transport Section 4 Technical report K Traffic and transport assessment
An assessment of the operation of existing and future transport networks including public transport, pedestrian and bicycle provision and their ability to accommodate the forecast number of trips to and from the development.	Section 15.2 and 15.3 Chapter 15 Traffic and transport Section 4 Technical report K Traffic and transport assessment
Details of the type of heavy vehicles likely to be used during the operation of the development and the impacts of heavy vehicles on nearby intersections.	Section 15.3 Chapter 15 Traffic and transport Section 4 Technical report K Traffic and transport assessment
Details of access to, from and within the site from the road network including intersection location, design and the impacts of heavy vehicles on nearby intersections.	Section 15.3 Chapter 15 Traffic and transport Section 4 Technical report K Traffic and transport assessment
Details of access to, from and within the site from the road network including intersection location, design and sight distance.	Section 15.3 Chapter 15 Traffic and transport Section 4.2 and Appendix B Technical report K Traffic and transport assessment

Assessment Requirements	Reference in EIS and Technical reports
Impact of the proposed development on existing and future public transport and walking and cycling infrastructure within and surrounding the site, including an assessment of the adequacy of public transport, pedestrian and bicycle provisions to meet future demand.	Section 15.2 and 15.3 Chapter 15 Traffic and transport Section 4 Technical report K Traffic and transport assessment
An assessment of the existing and future performance of key intersections providing access to the site, and any upgrades required as a result of the development.	Section 15.3 Chapter 15 Traffic and transport Section 4.5 Technical report K Traffic and transport assessment
An assessment of predicted impacts on road safety and the capacity of the road network to accommodate the development.	Section 15.3 Chapter 15 Traffic and transport Section 4.5 Technical report K Traffic and transport assessment
Plans of any road upgrades or any new roads required for the development, if necessary.	Section 15.3 Chapter 15 Traffic and transport Section 4 Technical report K Traffic and transport assessment
Demonstrate the measures to be implemented to encourage employees of the development to make sustainable travel choices, including walking, cycling, public transport and car sharing.	Section 15.4 Chapter 15 Traffic and transport Section 5 Technical report K Traffic and transport assessment
Appropriate provision, design and location of on-site bicycle parking, and how bicycle provision will be integrated with the existing bicycle network.	Section 15.3 and 15.4 Chapter 15 Traffic and transport Section 4.4 and 5 Technical report K Traffic and transport assessment Appendix B Architecture and landscape design strategy report
Details of the proposed number of car parking spaces and compliance with appropriate parking codes and justify the level of car parking provided on the site.	Section 15.3 Chapter 15 Traffic and transport Section 4.4 Technical report K Traffic and transport assessment

Assessment Requirements	Reference in EIS and Technical reports
Details of access and parking arrangements for emergency vehicles.	Section 15.3 Chapter 15 Traffic and transport Section 4.3 Technical report K Traffic and transport assessment
Detailed plans of the proposed layout of the international road network and parking provision on-site in accordance with relevant Australian Standards.	Section 15.3 Chapter 15 Traffic and transport Section 4.4 and Appendix C Technical report K Traffic and transport assessment
Details of any likely dangerous goods to be transported on arterial and local roads to and from the site, if any, and the preparation of an incident management strategy, if necessary.	Section 14.2, 14.3 and 14.4 Chapter 14 Hazard and risk Section 3.2.16 Technical report J Preliminary hazard analysis
The existing and proposed pedestrian and bicycle routes and end of trip facilities within the vicinity of and surrounding the site and to public transport facilities as well as measures to maintain road and personal safety in line with CPTED principles.	Section 15.2, 15.3 and 15.4 Chapter 15 Traffic and transport Section 2.2 and 5 Technical report K Traffic and transport assessment
The preparation of a draft Construction Traffic Management Plan which include: • Details of vehicle routes, number of trucks, hours of operation, access management and traffic control measures for all stages of construction. • Assessment of cumulative impacts associated with other construction activities. • An assessment of road safety and key intersections. • Details of anticipated peak hour and daily truck movements to and from the site. • Details of access arrangements for workers to and from the site, emergency vehicles and service vehicle movements. • Details of temporary cycling and pedestrian access during constructions. • An assessment of traffic and transport impacts during construction and how these impacts will be mitigated for any associated traffic, pedestrians, cycling and public transport operations.	Appendix A Technical report K Traffic and transport assessment

Assessment Requirements	Reference in EIS and Technical reports
Endeavour Energy SEARs	
Reticulation Policy	
In order to improve the reliability performance of and to reduce the operating expenditure on the network over the long term the company as adopted the strategy of requiring new lines to be either underground cables or where overhead is permitted, to be predominantly of covered or insulated construction. Notwithstanding this strategy, bare wire overhead construction is appropriate and permitted in some situations as detailed below.	Section 4.3 Technical report P Utilities and services assessment
In areas with the potential for significant overhanging foliage, CCT is used to provide increase reliability as it is less susceptible to outages from wind blown branches and debris than bare conductors. CCT must only be used in treed areas (substantial number of trees adjacent to the line) as the probability of a direct lightning strike is low. In open areas where the line is not shielded from a direct lightning strike, bare conductors must generally be used for 11kV and 22kV reticulation.	Section 4.3 Technical report P Utilities and services assessment
Non-Metallic Screened High Voltage Aerial Bundled Cable (NMSHVABC) must be used in areas which are heavily treed and where it is not practicable to maintain a tree clearing envelope around the conductors.	Not applicable to the proposal. Cabling within the proposal boundary is to be buried below ground.
Reticulation of new residential subdivisions will be underground. In areas of low bushfire consequence, new lines within existing overhead areas can be overheard, unless underground lines are cost justified or required by either environmental or local council requirements.	Not applicable to the proposal. The proposal is not a residential sub-division.
When underground reticulation is required on a feeder that supplies a mixture of industrial, commercial and/or residential loads, the standard of underground construction will apply to all types of load within that development.	Section 4.3 Technical report P Utilities and services assessment
Where ducting is used, adequate spare ducts and easements must be provided at the outset to cover the final load requirements of the entire development plan.	Section 4.3 Technical report P Utilities and services assessment
Extensions to the existing overhead 11kV/22kV network must generally be underground. Bare wire will be used for conductor replacements and augmentations except in treed areas where CCT or NMSHVABC must be used. Extensions to the existing overhead LV network and augmentations must either be underground or ABC. Conductor replacements greater than 100m in route length must utilise aerial bundled cable.	Section 4.3 and 4.6 Technical report P Utilities and services assessment

Assessment Requirements	Reference in EIS and Technical reports
Earthing	
The construction of any building or structure (including fencing, signage, flag poles, hoardings etc.) whether temporary or permanent that is connected to, or in close proximity to Endeavour Energy's electrical network is required to comply with Australian/New Zealand Standard AS/NZS 3000:2018 'Electrical installations' as updated from time to time. This Standard sets out requirements for the design, construction, and verification of electrical installations, including ensuring there is adequate connection to the earth. Inadequate connection to the earth to allow a leaking/fault current to flow into the grounding system and be properly dissipated places persons, equipment connected to the network and the electricity network itself at risk from electric shock, fire and physical injury.	Section 4.3 and Appendix A Technical report P Utilities and services assessment
Easement Management/Network Access	
The following is a summary of the usual / main terms of Endeavour Energy's electrical easements requiring that the landowner: • Not install or permit to be installed any services or structures within the easement site. • Not alter the surface level of the easement site. • Not do or permit to be done anything that restricts access to the easement site without the prior written permission of Endeavour Energy and in accordance with such conditions as Endeavour Energy may reasonably impose. Endeavour Energy's preference is for no activities or encroachments to occur within its easement areas. Most activities are prohibited within the padmount substation easement area. However, if any proposed works (other than those approved / certified by Endeavour Energy's Network Connections Branch as part of an enquiry / application for load or asset relocation project) will encroach / affect Endeavour Energy's easements or protected assets, contact must first be made with the Endeavour Energy's Easements Officer, Jeffrey Smith, on direct telephone 9853 7139 or alternately email Jeffrey.Smith@endeavourenergy.com.au or Easements@endeavourenergy.com.au. For further details please refer to the attached copies of Endeavour Energy's: • Mains Design Instruction MDI 0044 'Easements and Property Tenure Rights' which deals with activities / encroachments within easements. • General Restrictions for Overhead Power Lines.	Section 4.3 Technical report P Utilities and services assessment

Assessment Requirements	Reference in EIS and Technical reports
• Guide to Fencing, Retaining Walls and Maintenance Around Padmount Substations (for the future padmount substation likely required to facilitate the proposed development). It is imperative that the access to the existing electrical infrastructure on and in proximity of the site be maintained at all times. To ensure that supply electricity is available to the community, access to the electricity infrastructure may be required at any time. Restricted access to electricity infrastructure by maintenance workers causes delays in power restoration and may have severe consequences in the event of an emergency.	
Vegetation Management	
The planting of large trees in the vicinity of electricity infrastructure is not supported by Endeavour Energy. Suitable planting needs to be undertaken in proximity of electricity infrastructure (including any new electricity infrastructure required to facilitate the proposed development). Larger trees should be planted well away from electricity infrastructure and even with underground cables, be installed with a root barrier around the root ball of the plant. Landscaping that interferes with electricity infrastructure could become a potential safety risk, restrict access, reduce light levels from streetlights or result in the interruption of supply may become subject to Endeavour Energy's Vegetation Management program and/or the provisions of the *Electricity Supply Act 1995* (NSW) Section 48 'Interference with electricity works by trees' by which under certain circumstances the cost of carrying out such work may be recovered.	Appendix G Vegetation management plan (Technical report Q Biodiversity development assessment report)
Prudent Avoidance	
The electricity industry has adopted a policy of prudent avoidance by doing what can be done without undue inconvenience and at modest expense to avert the possible risk to health from exposure to emissions form electricity infrastructure such as electric and magnetic fields (EMF) and noise which generally increase the higher the voltage ie. Endeavour Energy's network ranges from low voltage (normally not exceeding 1,000 volts) to high voltage (normally exceeding 1,000 volts but not exceeding 132,000 volts / 132 kV). In practical terms this means that when designing new transmission and distribution facilities, consideration is given to reducing exposure and increasing separation distances to more sensitive uses such as residential or schools, pre-schools, day care centres or where potentially a greater number of people are regularly exposed for extended periods of time.	Section 2.6 Chapter 2 Strategic context

Assessment Requirements	Reference in EIS and Technical reports
These emissions are usually not an issue but with authorities permitting or encouraging development with higher density, reduced setbacks and increased building heights, but as the electricity network operates 24/7/365 (all day, every day of the year), the level of exposure can increase. Endeavour Energy believes that irrespective of the zoning or land use, applicants should also adopt a policy of prudent avoidance by the siting of more sensitive uses eg. the office component of an industrial building, away from and less susceptible uses such as garages, non-habitable or rooms not regularly occupied eg. storage areas in a commercial building, towards any electricity infrastructure – including any possible future electricity infrastructure required to facilitate the proposed development. Where development is proposed in the vicinity of electricity infrastructure, Endeavour Energy is not responsible for any amelioration measures for such emissions that may impact on the nearby proposed development. Please find attached a copy of Energy Networks Association's 'Electric & Magnetic Fields – What We Know' which can also be accessed via their website at https://www.energynetworks.com.au/electric-and-magnetic-fields and provides the following advice: • Electric fields are strongest closest to their source, and their strength diminishes rapidly as we move away from the source. • The level of a magnetic field depends on the amount of the current (measured in amps) and decreases rapidly once we move away from the source. Typical magnetic field measurements associated with Endeavour Energy's activities and assets given the required easement widths, safety clearances etc. and having a maximum voltage of 132,000 volt / 132 kV, will with the observance of these separation distances not exceed the recommended magnetic field public exposure limits.	

<table>
<tr><th>Assessment Requirements</th><th>Reference in EIS and Technical reports</th></tr>
<tr><td colspan="2">Dial Before You Dig</td></tr>
<tr><td>Before commencing any underground activity, the applicant is required to obtain advice from the Dial before You Dig 1100 service in accordance with the requirements of the <u>Electricity Supply Act 1995</u> (NSW) and associated Regulations. This should be obtained by the applicant not only to identify the location of any underground electrical and other utility infrastructure across the site, but also to identify them as a hazard and to properly assess the risk.</td><td>Section 20.4 Chapter 20 Utilities and services</td></tr>
<tr><td colspan="2">Removal of Electricity Supply</td></tr>
<tr><td>Approval for the permanent disconnection and removal of supply must be obtained from Endeavour Energy's Network Connections Branch (contact via Head Office enquiries on telephone: 133 718 or (02) 9853 6666 from 8am - 5:30pm) by Accredited Service Providers (ASP) with the relevant class of Authorisation for the type of work being carried out. The work could involve:
The disconnection and removal of an underground service cable or overhead service line.
Removal of metering equipment.
The written request must be submitted to Endeavour Energy using Form FPJ4603 'Permission to Remove Service / Metering by Authorised Level 2 Accredited Service Provider' which must be accompanied by Notification of Service Works (NOSW) forms provided as a result of service work activity performed by a Level 2 ASP. The retailer must also provide written agreement for the permanent removal of supply.
For details of the ASP scheme please refer to the above point 'Network Capacity / Connection'.</td><td>Section 4.3 Technical report P Utilities and services assessment
Section 22.4 Chapter 22 Related development</td></tr>
<tr><td colspan="2">Demolition</td></tr>
<tr><td>Demolition work is to be carried out in accordance with Australian Standard AS 2601—2001: 'The demolition of structures' as updated from time to time. All electric cables or apparatus which are liable to be a source of danger, other than a cable or apparatus used for the demolition works shall be disconnected ie. the existing customer service lines will need to be isolated and/or removed during demolition. Appropriate care must be taken to not otherwise interfere with any electrical infrastructure on or in the vicinity of the site eg. streetlight columns, power poles, overhead power lines and underground cables etc.</td><td>Section 3.2.2.1 Chapter 3 Proposal description
Section 20.4 Chapter 20 Utilities and Services</td></tr>
</table>

Assessment Requirements	Reference in EIS and Technical reports
Public Safety	
Workers involved in work near electricity infrastructure run the risk of receiving an electric shock and causing substantial damage to plant and equipment. I have attached Endeavour Energy's public safety training resources, which were developed to help general public / workers to understand why you may be at risk and what you can do to work safely. The public safety training resources are also available via Endeavour Energy's website via the following link: http://www.endeavourenergy.com.au/wps/wcm/connect/ee/nsw/nsw+homepage/communitynav/safety/safety+brochures. If the applicant has any concerns over the proposed works in proximity of the Endeavour Energy's electricity infrastructure to the road verge / roadway, as part of a public safety initiative Endeavour Energy has set up an email account that is accessible by a range of stakeholders across the company in order to provide more effective lines of communication with the general public who may be undertaking construction activities in proximity of electricity infrastructure such as builders, construction industry workers etc. The email address is Construction.Works@endeavourenergy.com.au .	Works to connect to the Endeavour Energy network will be designed by an Authorised Service Provider and undertaken in accordance with Endeavour Energy requirements.
Emergency Contact	
In case of an emergency relating to Endeavour Energy's electrical network, the applicant should note the Emergencies Telephone is 131 003 which can be contacted 24 hours/7 days. Endeavour Energy's contact details should be included in the any risk or safety management plan. Endeavour Energy's contact details should be included in any relevant risk and safety management plan.	Noted
Water NSW SEARs	
General Requirements	
WaterNSW requests the proponent address WaterNSW's 'Guidelines for Development Adjacent to the Upper Canal and Warragamba Pipelines' in the Environmental Impact Statement (EIS) to protect Sydney's critical water supply infrastructure, and in particular: Risk assessment — an assessment of the risks to the integrity and security of the Pipelines corridor that may result from the development and the proposed measures to mitigate against those risks and impacts. Specific issues include:	Section 5 and Appendix A Technical report P Utilities and services assessment

Assessment Requirements	Reference in EIS and Technical reports
implications for access and vehicle movements into the development site across the Pipelines corridor, WaterNSW access into the Pipelines corridor for operation and maintenance activities, and plant explosion potential (including an assessment of synergistic potential with the adjacent Global Renewables facility).	
Vibration — an assessment of the construction and operation vibration impacts of the development on the Pipelines corridor and the proposed measures to mitigate those risks and impacts.	Section 13.3 and 13.4 Chapter 13 Noise and vibration Section 6 and 7 Technical report I Noise and vibration impact assessment
Soils and Water — an assessment of the impacts of the proposed development on drainage paths and on the Pipelines corridor. The EIS should model pre- and post-development flows that enter or are conveyed across the Pipelines corridor. WaterNSW require that post- development flows be equal to or less than the pre-development flows for each storm event up to and including 1% AEP event. Additional surface and groundwater entering the Pipeline corridor should be prevented.	Section 12.3 Chapter 12 Hydrology and flooding Section 4 Technical report H Hydrology and flooding assessment
Electricity generation — impact assessment associated with the generation of electricity. Services should not increase the risk of Pipeline corrosion due to low frequency induction, and not increase the risk of earth potential rise and step and touch potentials on the metallic structures associated with the Pipeline's corridor.	Section 20.3 Chapter 20 Utilities and services Section 4 Technical report P Utilities and services assessment
Air quality—Prospect Reservoir lies approximately 1.9km from the site. Assessment of the potential dust/ash and air quality impacts on this sensitive receiver should be assessed.	Section 8.3 Chapter 8 Air quality and odour Section 9.3 Chapter 9 Human health risk Section 7.3 Technical report A Air quality and odour impact assessment Section 5.4.4.7 Technical report B Human health risk assessment
Western Sydney Parklands - the EIS should demonstrate how the development meets the provisions within State Environmental Planning Policy (Western Sydney Parklands) 2009 specifically clauses 12 and 13.	Section 2.5 Chapter 2 Strategic context Section 4.4 Chapter 4 Statutory context
Traffic - WaterNSW expect that the current Pipeline configuration will require augmentation to cater for the increasing demand for Sydney's drinking water supply, and that the Pipelines adjacent to this property (and along the length of the corridor) will eventually be replaced. No timeframes can be provided. This could cause access difficulties into the subject site for a significant length of time that would need to be carefully considered. In addition, the current access	Appendix A Technical report P Utilities and services assessment

Assessment Requirements	Reference in EIS and Technical reports
road into the property is not rated for heavy vehicles. A detailed traffic impact assessment should be included in the EIS.	
Environment, Energy and Science Group (EES) SEARs	
Built form and urban design	
EES recommends the development incorporates a Green Roof, Cool Roof and/or Green Wall into the design and the SEARs address this. The benefits of Green Roofs, Cool Roofs and Green Walls are outlined in the OEH (2015) Urban Green Cover in NSW Technical Guidelines which can be found at the following link: http://climatechange.envvironment.nsw.gov//Adapting-to-climate-change/Green-Cover	Section 4 and 6 Appendix B Architectural and Landscape Design Strategy Report
Aboriginal cultural heritage	
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 (OEH 2010), and guided by the Guide to investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW (DECCW, 2011).	Section 19.2 and 19.3 Chapter 19 Heritage Sections 5, 6 and 7 Technical report O Aboriginal cultural heritage assessment
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.	Section 19.3 Chapter 19 Heritage Sections 5 and 7 Technical report O Aboriginal cultural heritage assessment
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.	Section 19.3 Chapter 19 Heritage Sections 7, 8 and 9 Technical report O Aboriginal cultural heritage assessment

Assessment Requirements	Reference in EIS and Technical reports
Biodiversity	
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).	Section 21.3 Chapter 21 Biodiversity Table 3 Technical report Q Biodiversity development assessment report
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.	Section 21.3 Chapter 21 Biodiversity Sections 7, 8, and 9 Technical report Q Biodiversity development assessment report
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 development/project; • 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. If seeking approval to use the variation rules, the BDAR must contain details of the reasonable steps that have been taken to obtain requisite like-for-like biodiversity credits.	Section 8 Technical report Q Biodiversity development assessment report
The BDAR must be submitted with all spatial data associated with the survey and assessment as per Appendix 1 1 of the BAM.	Table 3 Technical report Q Biodiversity development assessment report
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.	Table 3 Technical report Q Biodiversity development assessment report

Assessment Requirements	Reference in EIS and Technical reports
Water and soils	
The EIS must map the following features relevant to water and soils including: a. Acid sulfate soils (Class 1, 2, 3 or 4 on the Acid Sulfate Soil Planning Map). b. Rivers, streams, wetlands, estuaries (as described in s4.2 of the Biodiversity Assessment Method). c. Wetlands as described in s4.2 of the Biodiversity Assessment Method. d. Groundwater. e. Groundwater dependent ecosystems f. Proposed intake and discharge locations	Section 3 Technical report F Soils and water assessment Section 12.2 Chapter 12 Hydrology and flooding Section 2 Technical report H Hydrology and flooding assessment Section 2-5 Technical report Q Biodiversity development assessment report
The EIS must describe background conditions for any water resource likely to be affected by the development, including: a. Existing surface and groundwater. b. Hydrology, including volume, frequency and quality of discharges at proposed intake and discharge locations. 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. 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. 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 11.3 Chapter 11 Soils and water Section 12.2 Chapter 12 Hydrology and flooding Section 3 Technical report F Soils and water assessment Section 2 and 4 Technical report H Hydrology and flooding assessment
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 11.3 and 11.4 Chapter 11 Soils and water Section 4 Technical report F Soils and water Section 12.3 and 12.4 Chapter 12 Hydrology and flooding

Assessment Requirements	Reference in EIS and Technical reports
b. Identification of proposed monitoring of water quality. c. Consistency with any relevant certified Coastal Management Program (or Coastal Zone Management Plan)	Section 4 and 5 Technical report H Hydrology and flooding assessment
The EIS must assess the impact of the development on hydrology, including: a. Water balance including quantity, quality and source. b. Effects to downstream rivers, wetlands, estuaries, marine waters and floodplain areas. c. Effects to downstream water-dependent fauna and flora including groundwater dependent ecosystems. 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). e. Changes to environmental water availability, both regulated/licensed and unregulated/rules-based sources of such water. f. Mitigating effects of proposed stormwater and wastewater management during and after construction on hydrological attributes such as volumes, flow rates, management methods and re-use options. g. Identification of proposed monitoring of hydrological attributes.	Section 12.3 and 12.4 Chapter 12 Hydrology and flooding Section 4 and 5 Technical report H Hydrology and flooding assessment
Flooding and coastal hazards	
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. b. Flood planning area, the area below the flood planning level. c. Hydraulic categorisation (floodways and flood storage areas) d. Flood Hazard.	Section 12.3 Chapter 12 Hydrology and flooding Section 2, 4 and Appendix A Technical report H Hydrology and flooding assessment
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 12.3 Chapter 12 Hydrology and flooding Section 2, 4 and Appendix A Technical report H Hydrology and flooding assessment

Assessment Requirements	Reference in EIS and Technical reports
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 12.3 Chapter 12 Hydrology and flooding Section 2, 4 and Appendix A Technical report H Hydrology and flooding assessment
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. 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. 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 d. Relevant provisions of the NSW Floodplain Development Manual 2005.	Section 12.3 Chapter 12 Hydrology and flooding Section 2, 4 and Appendix A Technical report H Hydrology and flooding assessment
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. b. Consistency with Council floodplain risk management plans. c. Consistency with any Rural Floodplain Management Plans. d. Compatibility with the flood hazard of the land. e. Compatibility with the hydraulic functions of flow conveyance in floodways and storage in flood storage areas of the land. f. Whether there will be adverse effect to beneficial inundation of the floodplain environment, on, adjacent to or downstream of the site. g. Whether there will be direct or indirect increase in erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses.	Section 12.3 Chapter 12 Hydrology and flooding Section 2, 4 and Appendix A Technical report H Hydrology and flooding assessment

Assessment Requirements	Reference in EIS and Technical reports
h. Any impacts the development may have upon existing community emergency management arrangements for flooding. These matters are to be discussed with the NSW SES and Council. 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. 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. k. Any impacts the development may have on the social and economic costs to the community as consequence of flooding.	

Appendix B

Architecture and landscape design strategy report

CLEANAWAY WESTERN SYDNEY
ENERGY & RESOURCE
RECOVERY CENTRE

Western Sydney Energy and Resource Recovery Centre

Architecture & Landscape Design Strategy Report

WSERRC-ARU-SYD-ARBU-RPT-001

ARUP

Prepared for

Cleanaway and Macquarie Capital

Front cover image

Illustrative view prepared by Arup.
Note: This image is indicative only and subject to further design development

Prepared by

ARUP

Barrack Place, Level 5, 151 Clarence St, Sydney NSW 2000

Australia

Contents

Introduction

Purpose of the Report

The Architecture and Landscape Design Strategy Report forms part of the Environmental Impact Statement (EIS) for the proposed Energy from Waste facility at 339 Wallgrove Road, Eastern Creek, NSW.

The purpose of this report is to capture the initial design work that has been undertaken as part of the EIS. Integrating architectural and landscape design early has allowed core design principles to be instilled in the project from the outset. The design work has been undertaken in close collaboration with the wider design team and technical specialists to ensure a good understanding of the technical requirements.

The design process to date is also outlined in a supporting video. To view, please refer to the QR code below, or by clicking on the link here.

Project Description

Cleanaway and Macquarie Capital are jointly developing an energy-from-waste (EfW) facility known as the Western Sydney Energy and Resource Recovery Centre (WSERRC) (the proposal).

The proposal will be designed to thermally treat up to 500,000 tonnes per year of residual Municipal Solid Waste (MSW) and residual Commercial and Industrial (C&I) waste streams that would otherwise be sent to landfill. This process would generate up to 58 megawatts (MW) of base load electricity some of which would be used to power the facility itself with the remaining 55MW exported to the grid. The proposal involves the building of all on-site infrastructure needed to support the facility including site utilities, internal roads, weighbridges, parking and hardstand areas, storm water infrastructure, fencing and landscaping.

A Visitor & Education Centre is also included in the design proposal.

Architectural Design

The architectural design of the proposal has been key to the project from its inception. The architectural team has worked closely with the wider technical specialists, including Ramboll in to ensure that the operational requirements of the facility are integrated into the overall design.

The design work undertaken to date represents the beginning of the design process and further development will occur in subsequent stages.

The key areas addressed in the early stage design work are the integration of the built form into the existing context, measures taken to mitigate the visual bulk of the building, initial direction on materiality and consideration of the human experience of the project, from passers-by to employees and visitors.

The design responds to the Secretary's Environmental Assessment Requirements (SEARs). Engagement with stakeholders has been undertaken through the preparation of the EIS. Comments from the Blacktown Council Architects on the form and materials have received have influenced and helped to shape the design. Following direction from the Western Sydney Parklands Trust, the design ensures the continuation of green areas through the site.

The architectural team has worked closely with specialist consultants to understand the technical parameters of the facility.

As part of Arup's iterative design process, 2d and 3d software has been used to test design options and refine the concept. Regular design reviews have been undertaken to ensure robust and diverse critique.

Regular progress updates have been presented to the client and stakeholders including Blacktown Council and the community through a video providing an overview of the design.

The community will be consulted during the detailed design phase of the project through the established WSERRC Community Reference Group (CRG). While yet to be determined, it is envisioned that the CRG will provide feedback and input into features of the Visitor and Education Centre, aspects of the green wall and landscaping and, where possible, final materials selections. Wider community engagement will be encouraged where appropriate, for example, in selecting a local artist to contribute to specific design elements.

Report Structure

Section 01 - Aspiration

Setting out the core aspirations for the project. These are informed by the wider project priorities, context wide strategic documents, initial input from stakeholders and overall client aspirations.

Section 02 - Context

High level site analysis has been undertaken to understand the project context. The architectural design has also been informed through close collaboration with specialists consultants, including the engineers, heritage, ecology, hydrology, geotechnical, socio-economic and landscape design. This appreciation directly informs the site-wide design moves and provides a launch-pad for the architectural design of the facility.

Section 03 - Architectural Approach

Describing a considered series of architectural design moves which encapsulate the physical design steps undertaken to address and implement the project aspirations, including ensuring its integration with the local environment

Section 04 - Materiality

Establishing an approach to the selection of materials which is informed by the project aspirations and integrated with the local area character, both established and emerging. Key principles are established as guidelines in order to inform appropriate material selections in the upcoming design stage. Materials selections descriptive at this stage to set parameters, without excluding further design refinement.

Section 05 - Visitor Experience

The curated visitor experience has been carefully considered as a means of connecting with the public, showcasing the facility and educating and informing visitors. The journey of a visitor through the plant has been designed in order to deliver an exemplar experience that gives full transparency into the operation of the facility.

Section 06 - Landscape

A conceptual approach is presented to the design of the landscape. This design process is also informed by the project aspirations and visitor experience. There is an emphasis on the promotion of native biodiversity. Resilience is also considered as a core principle to the design of the landscape.

Appendix

Conceptual architectural drawing package.

Indicative visualisation - Western Facade

01
Aspiration

Key drivers

Joint venture partners Cleanaway and Macquarie Capital both hold strong values in terms of promoting innovation and sustainability.

The design of the facility must also instill these values, positioning the development as exemplar, not only in its operation but also in its wider consideration of the site context, its human interface and it's interaction with the natural environment.

After careful consideration of the above, as well as the overarching project drivers, comments from stakeholder groups in response to the SEARs and analysis of the site, four key aspirations have been identified. These aspirations form the fundamental drivers for the emerging architectural design.

"Our mission is to make a sustainable future possible – for our people, our customers, the communities where we work, our investors and our planet. We are committed to the triple bottom line of sustainability that delivers a financially strong and resilient business, contributes to a thriving and healthy population through employment and community engagement, and leads our industry to protect our planet for generations to come."[1]

[1] Making a Sustainable Future Possible, Cleanaway [https://www.cleanaway.com.au/sustainable-future-hub/]

Design Aspirations

Embrace Innovation

- Become a catalyst for high quality design and innovation in Western Sydney.
- Create an exemplar facility.
- Promote a circular economy.

Integrate with the context

- Positively contribute to and integrate with existing and emerging local character of the area, as much as possible.
- Ground the building into the unique local context.
- Shape the built form to mitigate visual impact.
- Select materials which compliment and align with the local environment.

Invigorate the wider ecosystem

- Benefit the local ecosystem and micro-climate.
- Responsibly manage the site through the handling of storm-water and the reuse of collected rain water.
- Focus the planting strategy around the use of native trees and shrubs to reinvigorate native biodiversity.

Provide a generous human interface

- Be honest and transparent about the purpose of the facility.
- Carefully consider the building's appearance from key public viewing points.
- Provide an excellent visitor experience to educate and inspire.
- Provide an excellent working environment for employees.

Existing site aerial photo - View to the North-East, September 2019

02 Context

Proposed site

Site parameters

The proposal site is located at 339 Wallgrove Road in Eastern Creek, NSW (Lot 1 DP 1059698) which is in the Blacktown local government area (LGA). The site is in the Wallgrove Precinct of the Western Sydney Parklands (WSP) Plan of Management.

The 8.23ha site is divided by a small strip of land not part of the proposal site, resulting in a 2.04ha northern section and a 6.19ha southern section. This dividing strip is part of the adjacent lot and includes a right of carriageway benefiting the proposal site allowing vehicles to move between the two parts of the site. The proposal area will be fully contained in the 6.19ha portion of the site. Works to occur on the 2.04 ha northern section of the site include the clearing of weeds and exotic vegetation within the existing overland flow channel which is confined to the eastern section of this parcel of land. The northern section will also be used temporarily to support construction works. It is not currently expected that any other works will occur on the 2.04 ha northern section of the site as part of this proposal.

The eastern edge of the site is less developed and it is proposed that this will be retained as an area of increased vegetation.

Location

The site is located in the Wallgrove Precinct of the Western Sydney Parklands. The area is characterised by its proximity to neighbouring infrastructure including the M7 Motorway and industry to the west, the pipeline to the south and existing industrial and waste management facilities to the north and east.

The site location is preferable as it positioned within an area which is already developed and industrialised, the site itself was previously used for industrial and agricultural purposes. To the west of the site is the Eastern Creek industrial area and to the south of the site is the Austral Bricks facility. Several waste facilities such as the now-closed Eastern Creek landfill site and the operational Global Renewables waste management facility are located to the north and east. The site avoids any existing and planned residential areas with the closest residential area around 1km to the south.

The site's location directly adjacent to the M7 Motorway and Wallgrove Road is also favorable as it provides convenient road access, minimising any additional travel distance for heavy vehicles. Furthermore, its location in Western Sydney also means that it is close to primary waste sources, again reducing the need for excess vehicular movement.

Existing view of site looking North, September 2019

Aerial photograph [https://maps.six.nsw.gov.au/]

Site-wide design moves

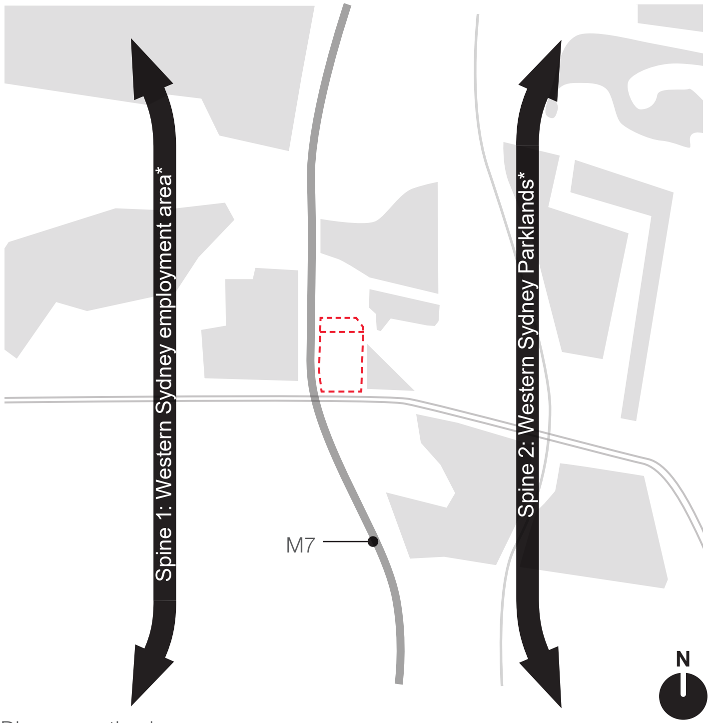
In order to establish the built form on the site, a series of site-wide moves are implemented at the macro scale. These decisions are made in order to ground the project into the broader context of the locality.

Diagram extracted from: A metropolis of three cities, Greater Sydney Commission

1. Integrate with context

- Recognise the project's position on significant north-south development spines. Develop the design to integrate with both the emerging Western Sydney Employment area and the Western Sydney Parklands.
- Become a positive catalyst for emerging character the Central City District.
- Recognise position within the Wallgrove precinct of the Western Sydney Parklands and contribute towards the 2030 goals.[1]
- Recognise key public viewing corridors towards the site, particularly from the M7 corridor and develop built form to mitigate visual impact.
- Proposal is consistent with the use planed for this area of the Western Sydney Parklands including recycling and energy. Noting that adjacent areas have historically hosted landfill.

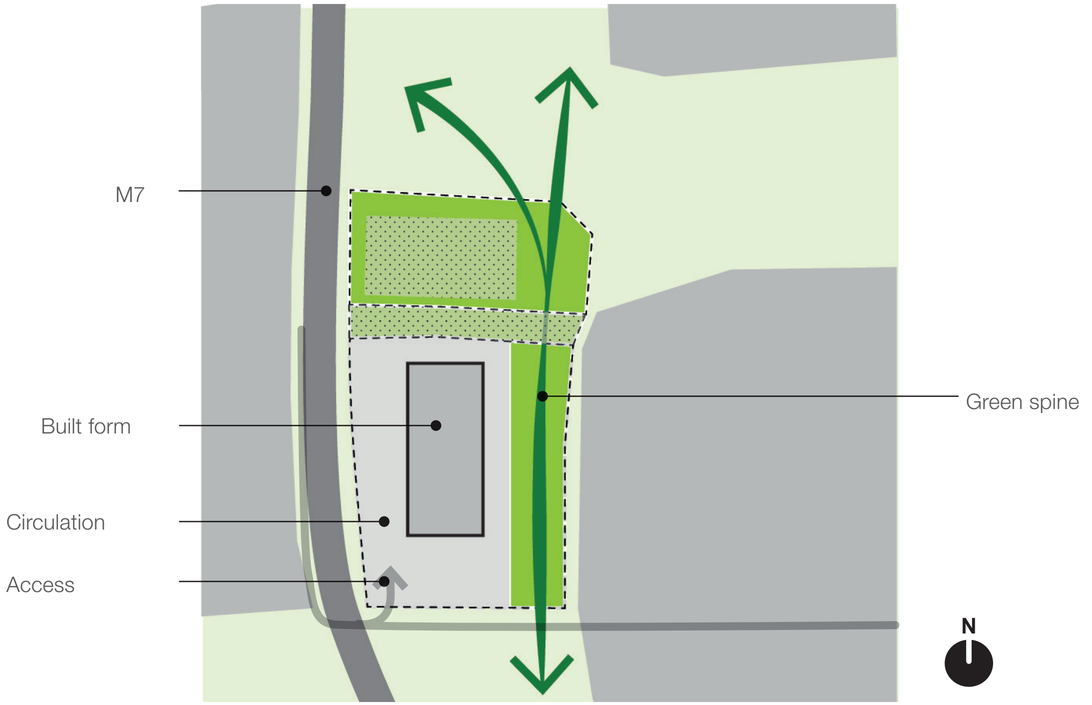
[1] Plan of Management 2030, Western Sydney Parklands



Diagrammatic plan

2. Designate site use

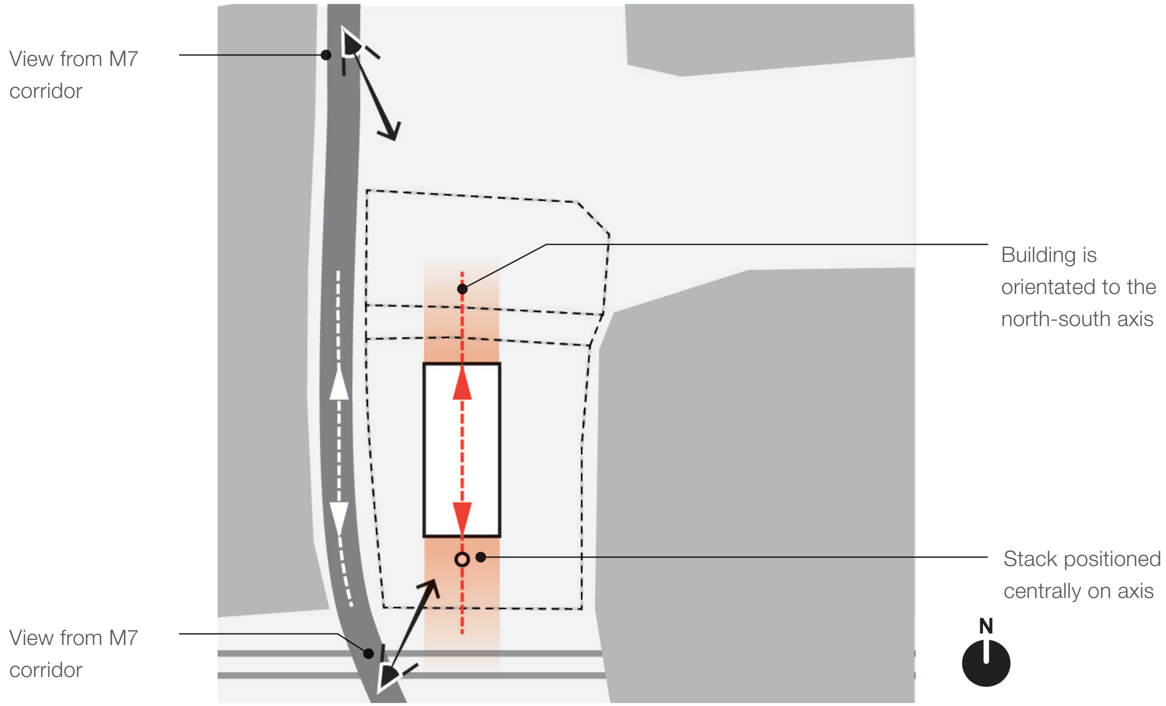
- Consolidate built form footprint.
- Avoid sprawl by clustering buildings in one area.
- Provide dedicated and joined-up green areas.
- Reinstate native flora & fauna including planted channel and ‘grasslands’ character.
- Use the built form to shield the eastern reserve areas from the road.
- Provide sediment basin to capture and control runoff.
- Site access from the south using existing route, promoting Western Sydney Parklands and the Office of Strategic Lands Plans to reclaim the land to the north.



Diagrammatic plan

3. Orientate and position

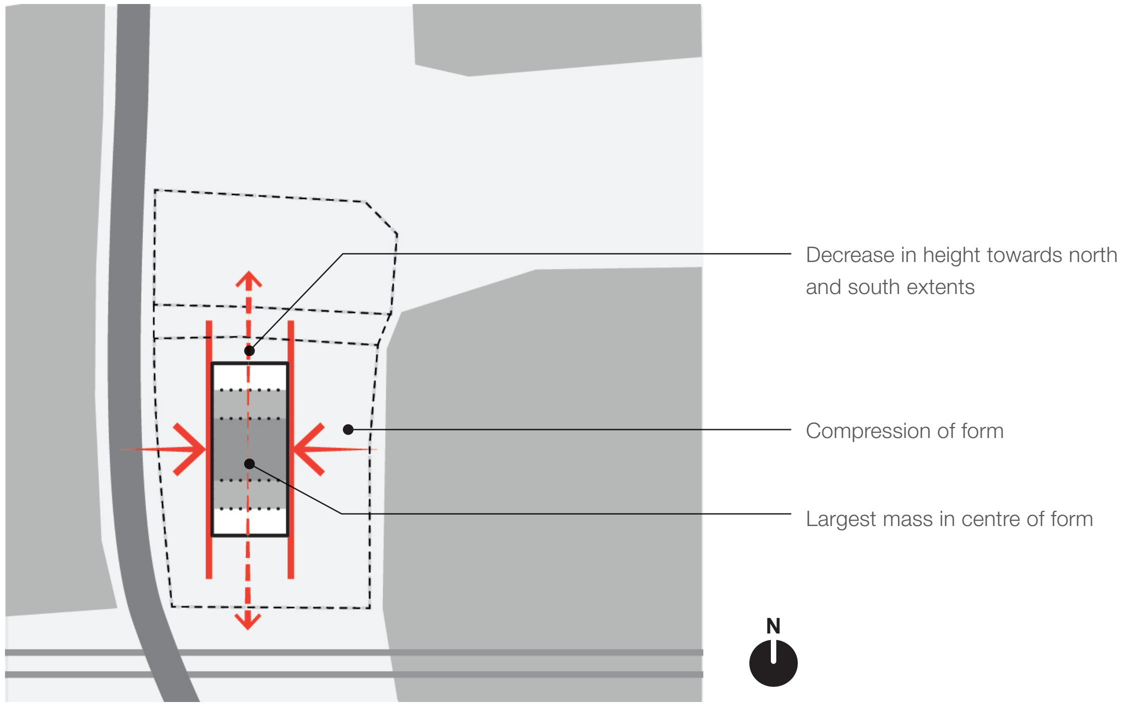
- Positioning of the built form towards the south western boundary which aligns with exiting local developments.
- Orientation of built form to align with M7.
- Position the stack on existing axis of the M7 corridor and align with the built form.
- Work with (and not in conflict with) the existing topography.



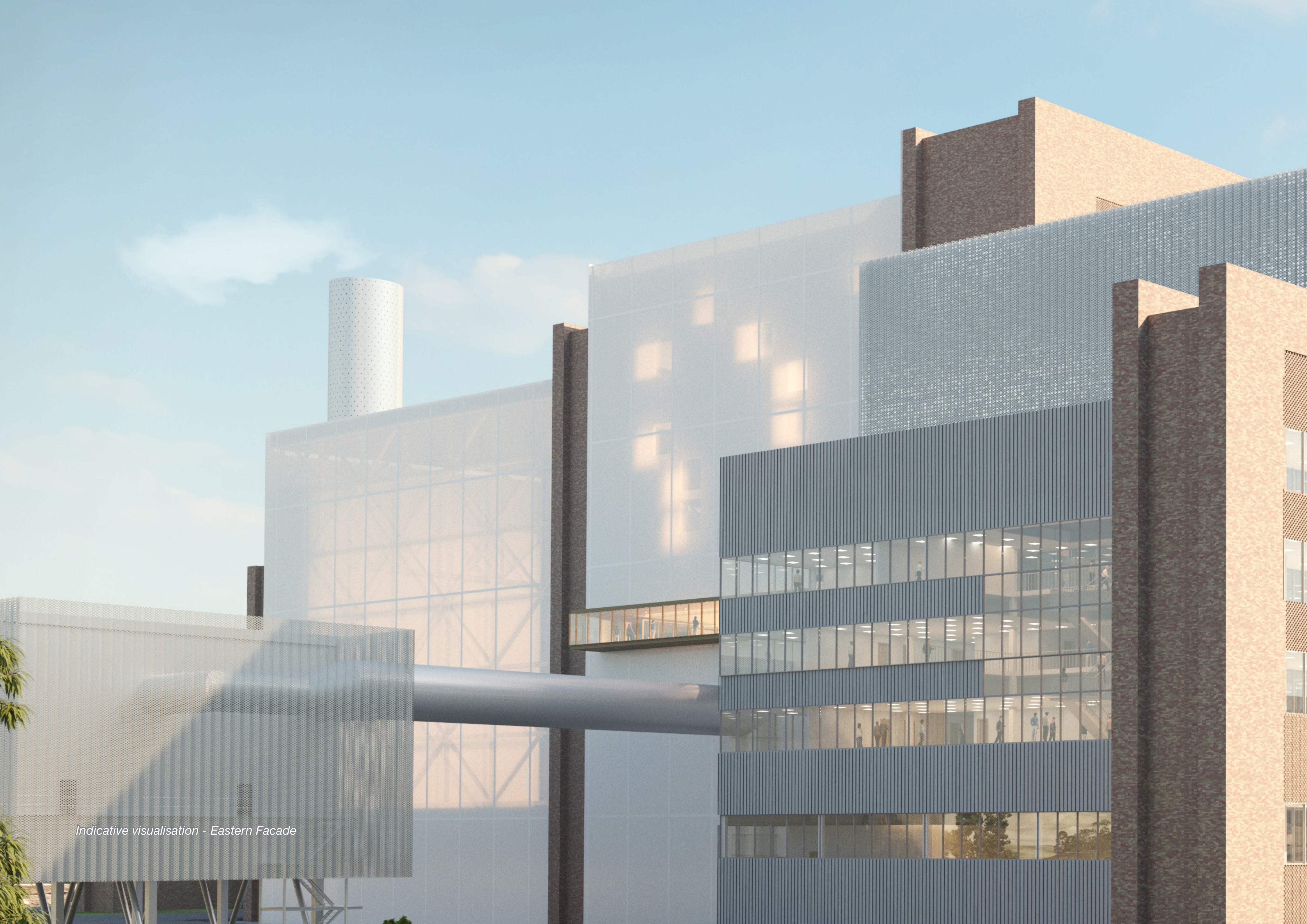
Diagrammatic plan

4. Manipulate form

- Compress the form to reduce perceived mass from primary view corridors.
- Locate greatest massing height in the center of the built form to mitigate abrupt change in scale.
- Lowest masses to be located to north and south extents of built form so that the mass incrementally 'rises' up from the landscape.
- Merge smaller ancillary buildings into the landscape by keeping them as low as possible and camouflaging the roofs. For example the Visitor & Education Centre which is a single level and has a green roof.



Diagrammatic plan



Indicative visualisation - Eastern Facade

03
Architectural Approach

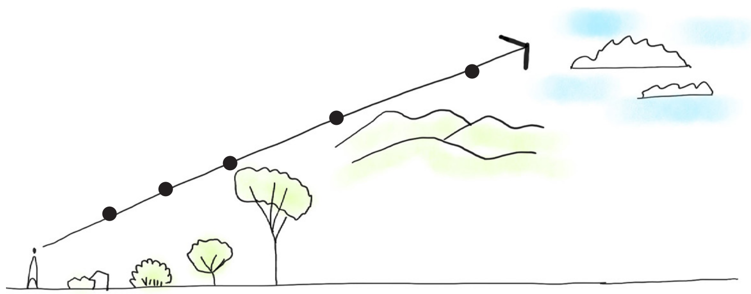
Concept

Building form expressed through layers

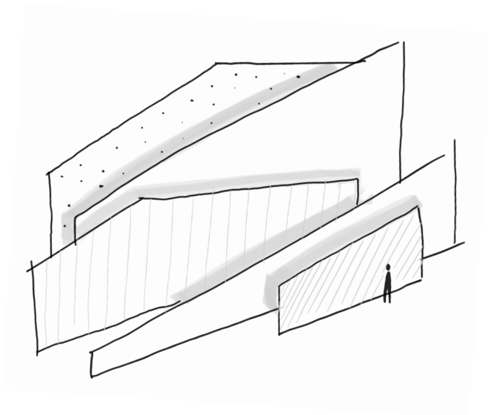
The conceptual approach draws inspiration from the landscape and the natural change in scale from smaller elements in the foreground such as trees and shrubs to larger more distant elements such as hills and mountains. When viewed across a landscape, these natural elements appear as layers, becoming incrementally more recessive as they disappear into the distance.

By breaking down the form of the building into a series of layers, the apparent bulk is minimised. The layers build in scale towards the center of the built form, allowing the building to incrementally rise up from the landscape. The smallest layers are located where people directly encounter the building at the northern and southern ends.

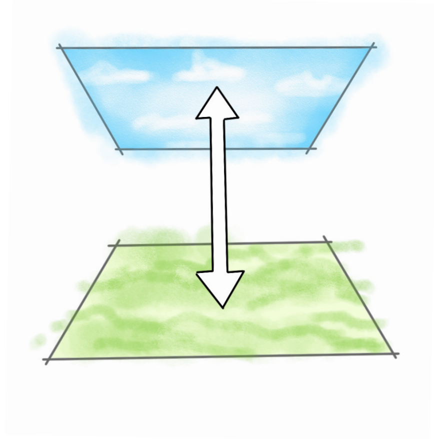
Conceptual image: Layering



1. Transition between scale using natural references



2. Layered planes to address human scale



3. Mediate between land and sky

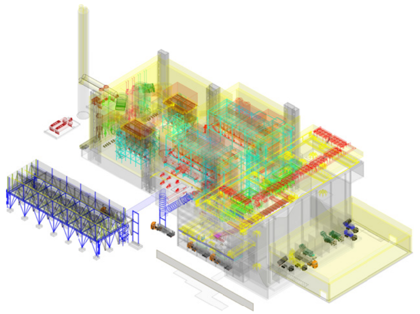
Design options

Initially, three options were tested as a means of capturing the functional mass in a form which encapsulates the aspirations. These approaches were developed as diagrams and critiqued through as part of Arup's design review process.

The following approaches were tested:

1. Layered 'blades' (Selected)
2. Landscape manipulation
3. Curved 'shell'

The first option, 'Layered Blades' was selected for progression for the reasons listed adjacent.



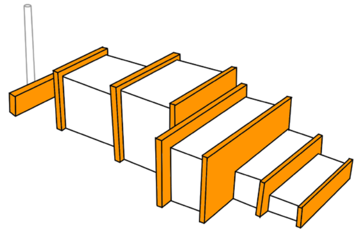
Functional mass
Working engineering 3d model, Ramboll

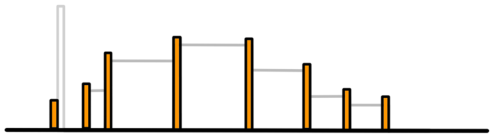
SELECTED

1. Layered 'blades'

Pros:

- Facade wraps tightly to the functional form of the building.
- Vertical subdivision breaks up bulk and mass.
- The blades capture functional volume neatly and without wasted space.
- Unlock opportunity for material expression in in-between zones.
- Perceived mass is reduced from most important viewing angles.
- Building rises from landscape.





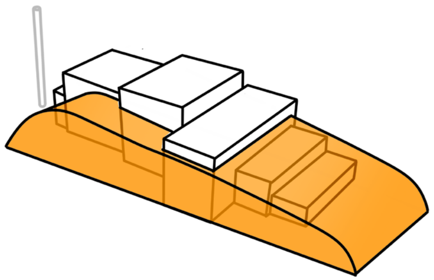
2. Landscape manipulation

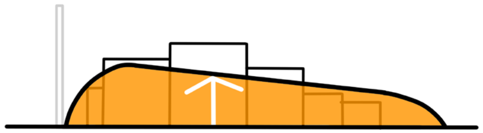
Pros:

- Lifting the landscape to minimise the perceived built form.

Cons:

- Building bulk increases at lower levels.
- Very disruptive to landscape.
- Significant impact to local ecosystem and watershed.
- Limited impact from primary viewing corridors.
- Non cost effective use of resources.
- Reduced transparency and educational opportunities.





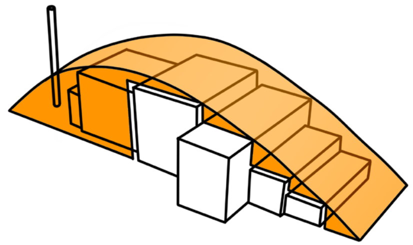
3. Curved 'shell'

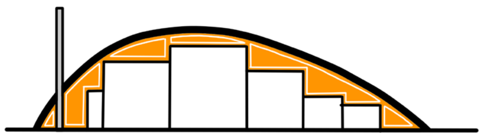
Pros:

- A single form encompasses and unifies the irregular building mass.

Cons:

- The overall scale of the form is actually increases as the cladding does not wrap tightly to the massing of the facility.
- The curved canopy captures a large amount of air-space.
- The eye is drawn up and along the curved from and is attracted to the tallest part of the building. This has the potential to increase the apparent mass of the building.
- Sun reflectivity from the curved form may present a safety issue.
- There is no opportunity to conceal roof mounted plant as the roof-scape is highly exposed from the adjacent road.





Architectural moves

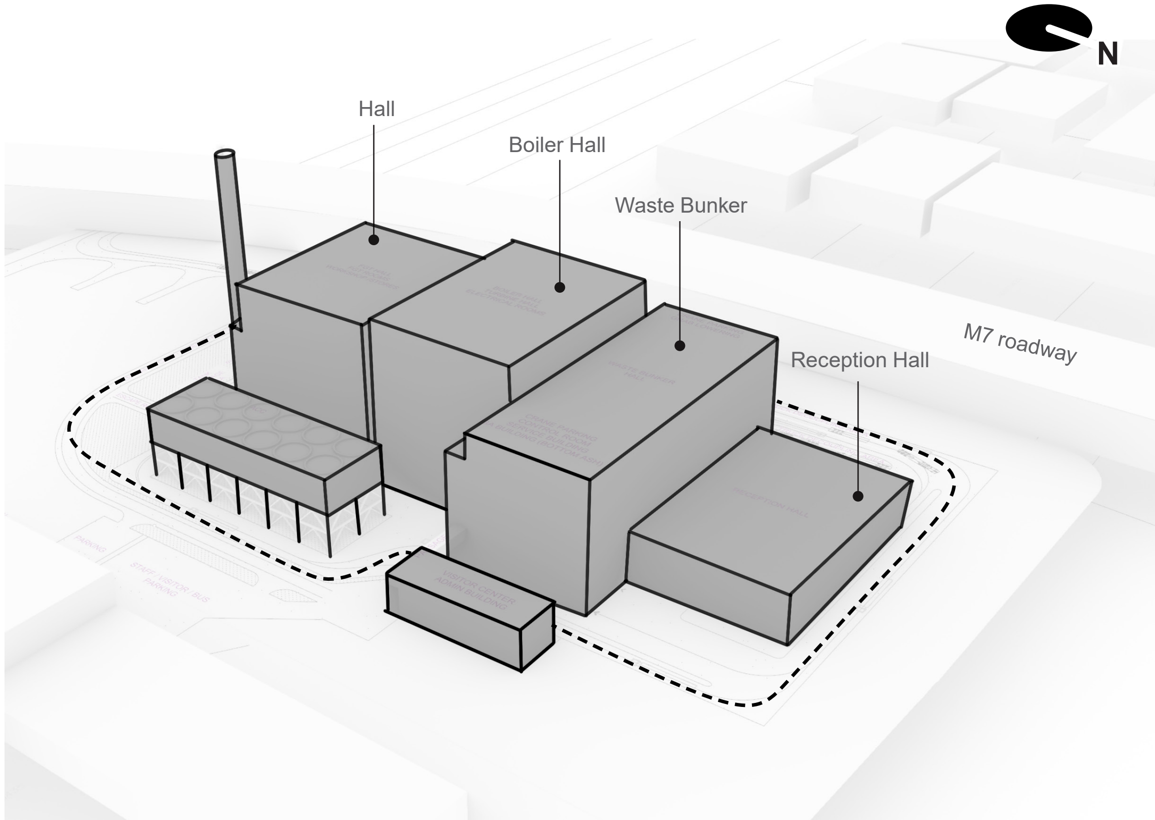
In response to the project aspirations and the concept of 'layering', a series of architectural moves are made.

These moves build on the broader site wide moves in order to contextually ground the project, establish it's form in the landscape, mitigate it's visual bulk, identify opportunities to benefit the local ecosystem and to connect people to the building, both through visual perception and physical interaction.

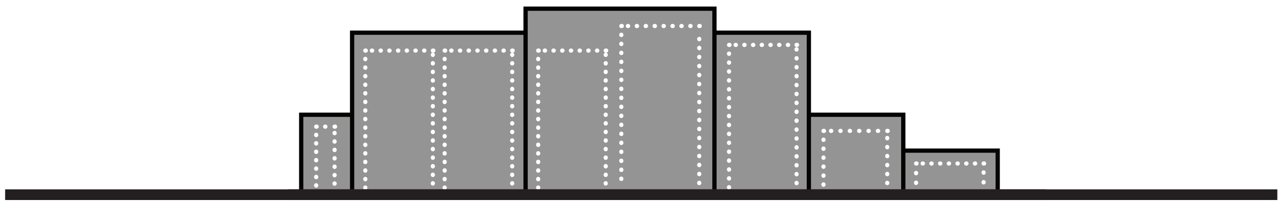
1. **Respect and work with the functional massing**
2. **Introduce vertical 'layers' to break up the volume**
3. **Establish built form hierarchy**
4. **Provide a generous human interface**
5. **Reinvigorate the local ecosystem**

1. Respect and work with the functional massing

- Understand the functional and spatial requirements of the facility though close collaboration with the specialist engineering team.
- Develop an architectural approach which seeks to enable efficient and streamlined operations.
- Facade treatment to work in harmony with functional contents.
- Fully enclose the operational equipment to control visual perception and acoustics.
- Establish clear and rational vehicular access routes around the facility which minimise travel distances.



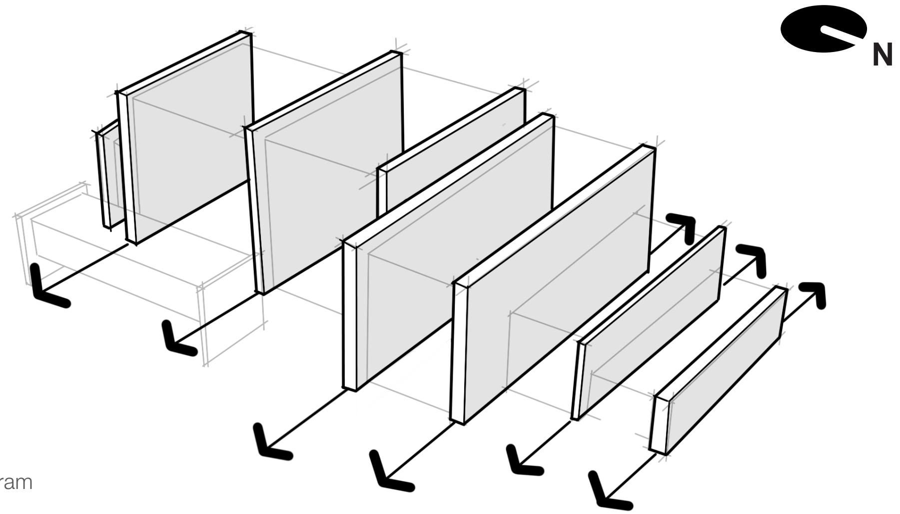
Indicative 3d diagram



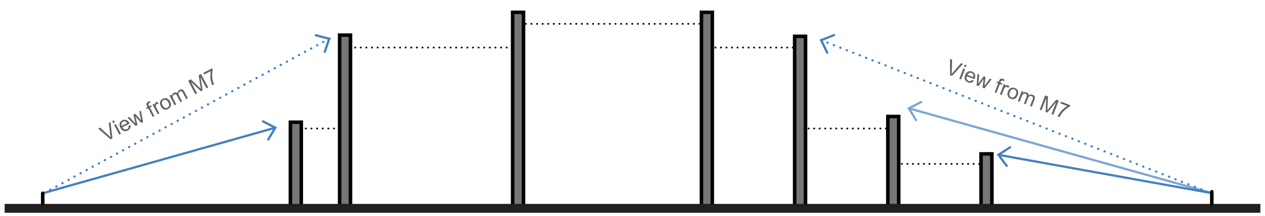
Eastern elevation diagram

2. Introduce vertical 'blades' to break up the volume

- Use vertical subdivision to break up the monolithic bulk and mass of the building.
- Create a series of layered 'blades' which incrementally rise up from the landscape. The tallest being in the center of the building.
- Set a 'rhythm' to the building and break up long, monotonous façades.
- Break up the mass from key viewing corridors from the M7 in the north and south directions.



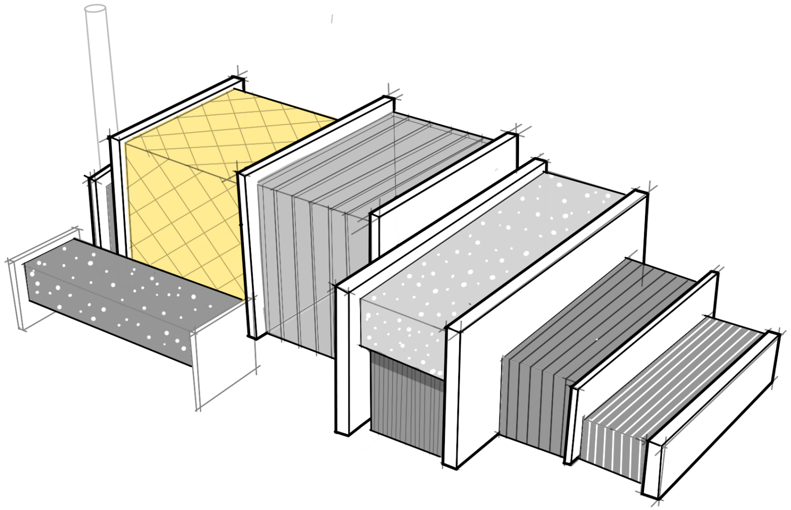
Indicative 3d diagram



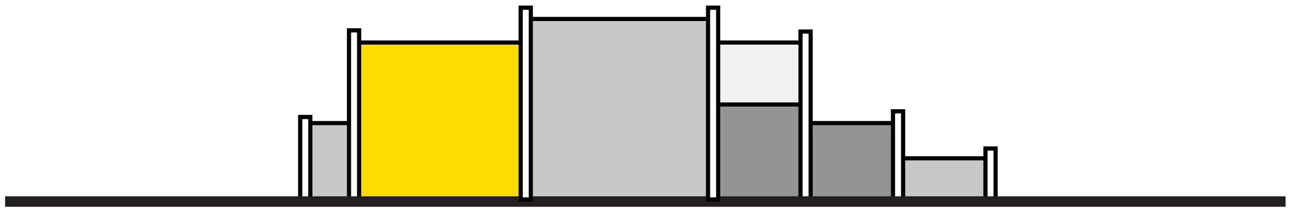
Eastern elevation diagram

3. Establish built form hierarchy

- Clad 'infill' areas with varying materials to break up mass.
- Give an abstracted sense of the internal operations process to suggest function.
- Create 'transparency' and avoid public misconception through use of semi-transparent materials in selected areas.



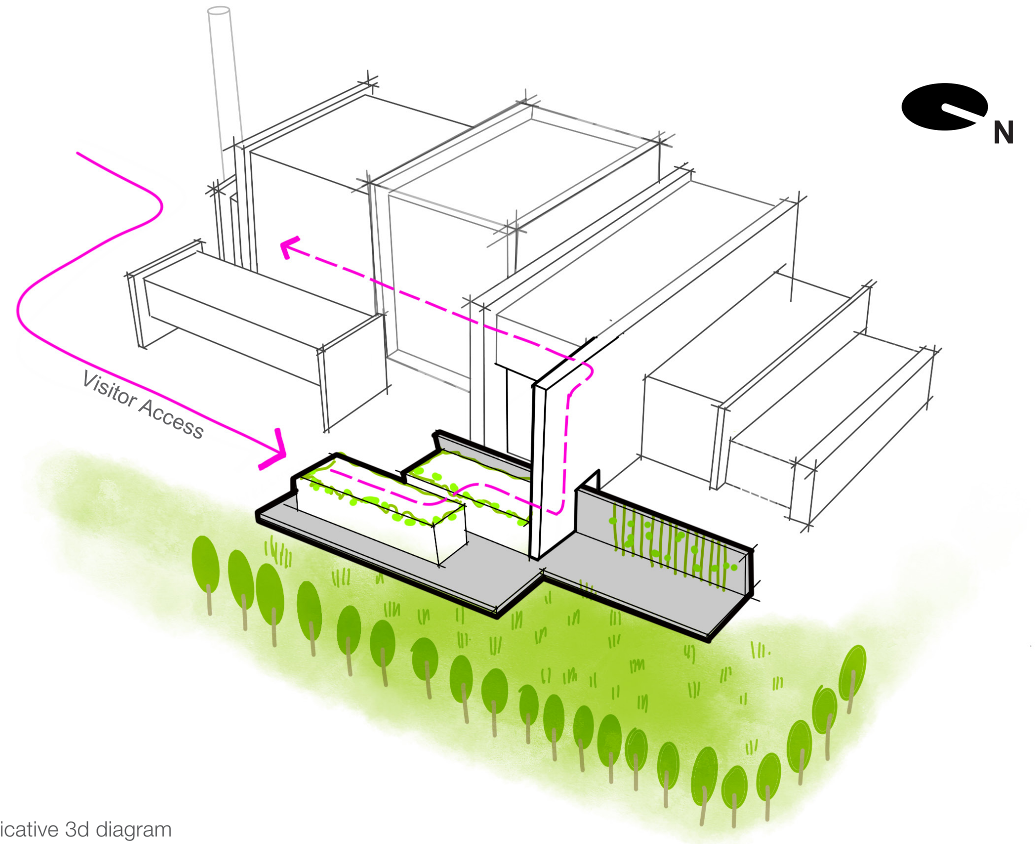
Indicative 3d diagram



Eastern elevation diagram

04 - Generous Human Interface

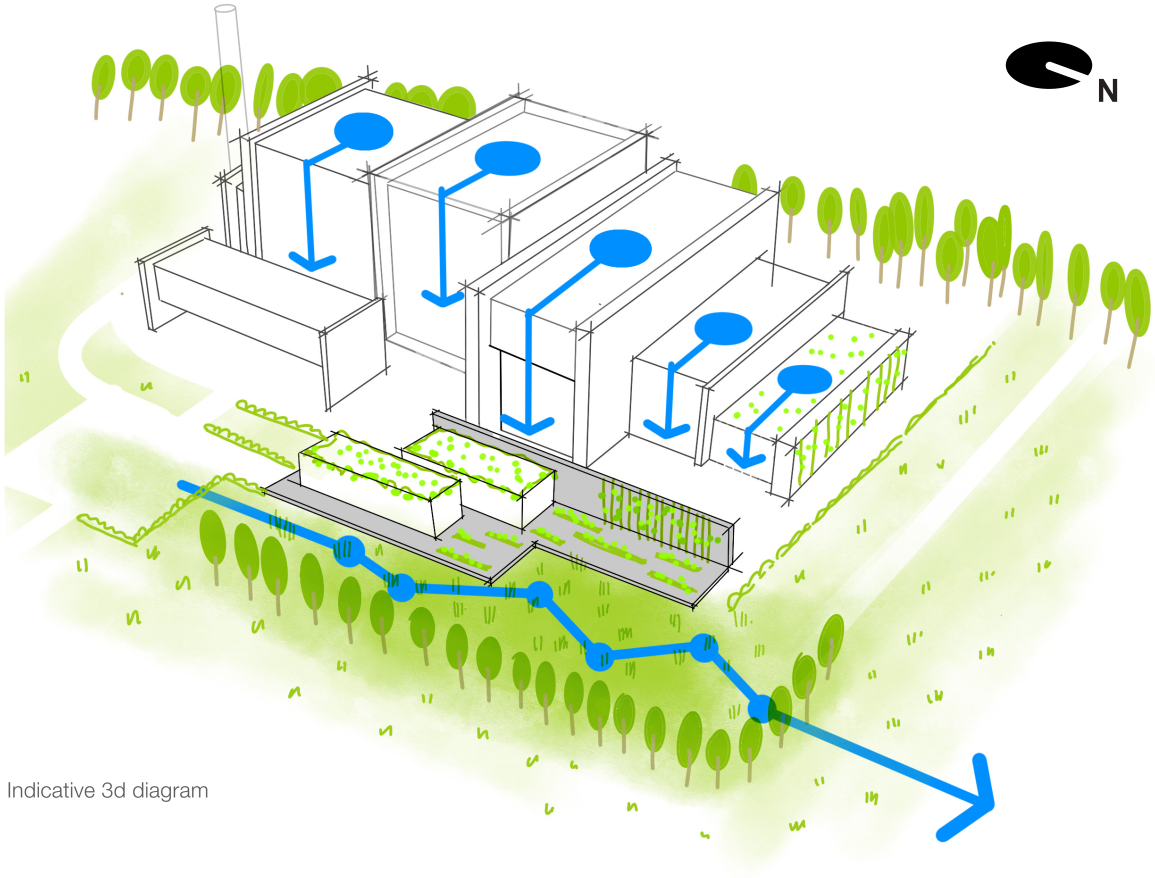
- Establish a ‘front door’ through which all people enter the building.
- Embrace public and local community through welcoming visitor experience.
- Showcase operations through visitor experience and promote education.
- Provide a desirable workplace.
- Dedicated on-site parking enabling ease of access for visitors and staff.



Indicative 3d diagram

05 - Benefit Local Ecosystem

- Collect rainwater from the roof for use in the EfW process.
- Positivity impact local micro-climate through new planting and materials selections to mitigate heat sink.
- Benefit biodiversity through planting of native shrubs and trees and new bioretention basin.
- Improve resilience to weather extremes through provision of on site detention basin.



Indicative 3d diagram

Notes:

- Roof rainwater collection intended to be used as source for process water.
- Individual tank on each side of the building to serve individual process lines. This meets requirements in the SEARs.
- Run-off from hard-standing will be directed to the bioretention basin.
- Detention basin will be dry during periods of low rainfall.

Indicative View - Southern Elevation

Indicative View - Northern Elevation

Indicative View - Western elevation

Indicative View - Eastern elevation

Indicative visualisation - Western Facade

04
Materiality

Material Guidelines

Initial guidelines have been established to set the expectation for the visual characteristics of materials. Final materials will be selected in the upcoming detailed design stage, and these must consider sustainable procurement practices as well as demonstrate exemplar sustainability credentials, including the consideration of the materials' source, manufacturing processes, embodied carbon, life cycle and end of life strategy. This is particularly important for the large areas of cladding to the main building.

The materials are intended to help embed the project within it's setting. References are taken from both the natural and man-made characteristics of the local area. The overall tone of the building is subdued. Two key materials pallets are identified; earth and sky.

Earth

Solid elements such as the 'blades' and those areas which reach down to the ground plane are composed of solid, earthy toned materials with little decoration or adornment. These elements ground the built form and enhance it's connection to the terrain. The blades also offer the functional purpose of housing cores.

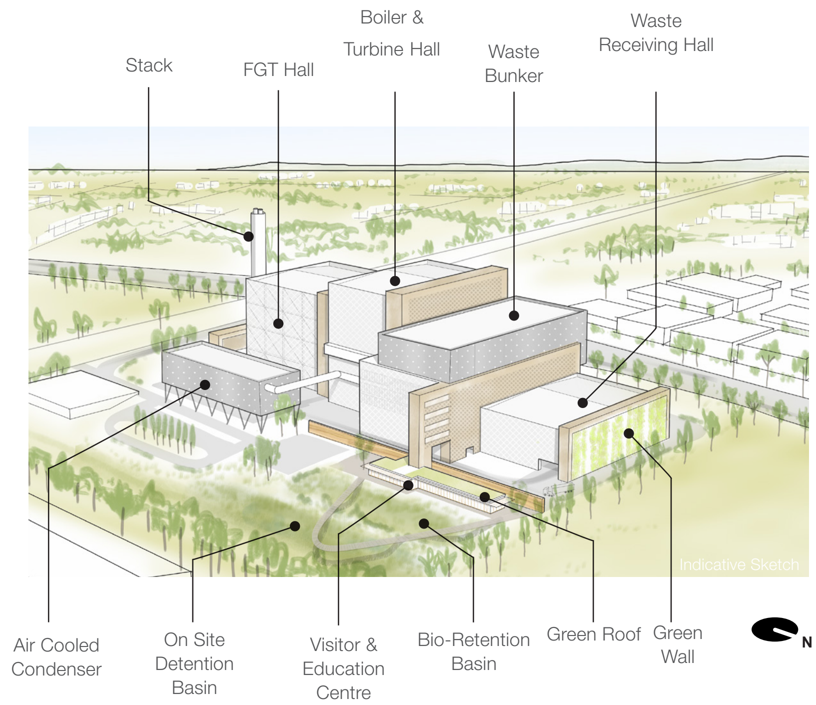
Large green walls bookend the built form. The orientation of these directly address the oncoming cars and cyclists on the M7, greeting them with a softened, natural elevation.

The Visitor & Education Centre is proposed to be of timber construction which has relatively low embodied carbon. A green roof is also proposed along with green walls on the northern and southern sections of the EfW building. The use of rammed earth is suggested or the main wall dividing the Visitor and Education Centre from the vehicular route. If possible, the rammed earth should be made from earth excavated from the site, or at the very least from the local area.

Sky

The spaces between the blades expressed in a more lightweight manner. This palette is subtly-reflective in places and has varying levels of transparency. These characteristics allow the building to gently change appearance through the day, responding to the time of day, the seasons and the weather. Varying transparencies also help to blur the extents of the form and provide glimpses into the internal processes.

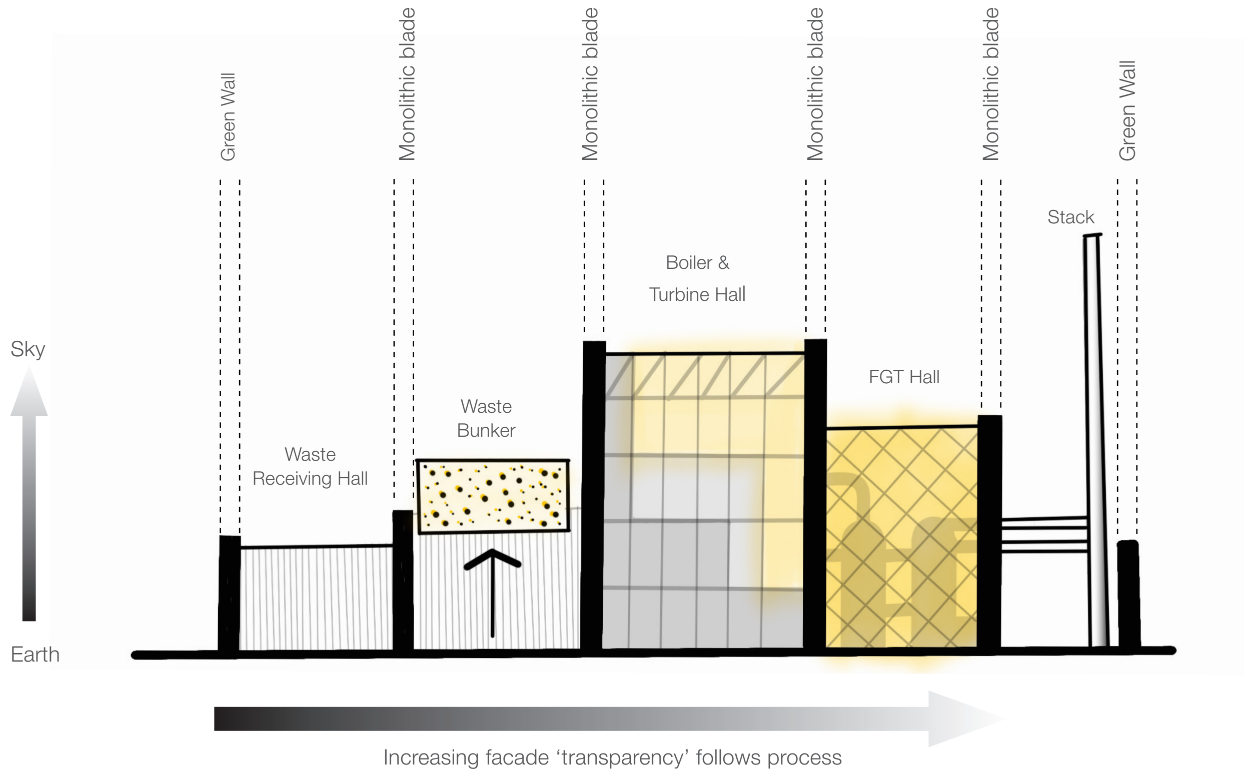
At dusk, the use low level lighting to achieve a dim glow is proposed in localised areas such as the flue gas treatment hall. It is expected that any lighting treatments will not be externally mounted and directed at the facades, rather they are to glow from within the building as a means of communicating occupancy and operation.



Indicative 3d diagram

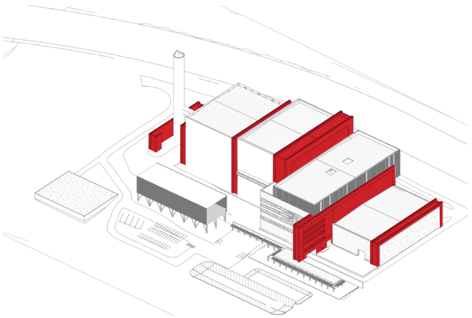
Material Principles

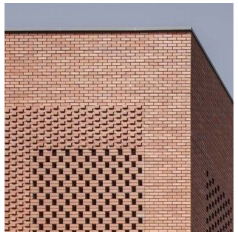
- Recessive colour palette for the building that is inspired by natural landscape.
- The 'blade forms' break up the bulk of the building and grounds it to the site. The material selection for the blades should reflect this grounding nature of these elements.
- Bookend building to north and south with large green walls that further help soften the view of the building.
- In-between spaces clad with materials of varying transparency.
- Subtle increase in facade transparency moving from North to the South of the facade to follow the process and hint at internal operations and give sense that building is operational and occupied.
- External illumination minimised at night. Building will be lit internally to create a 'moon lit' glow.
- Stack clad in low-reflective material to subtly respond to changing weather conditions and blend into the sky.

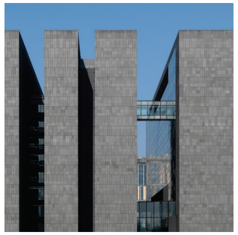


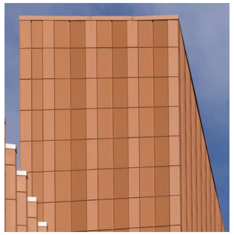
East Elevation - Diagrammatic

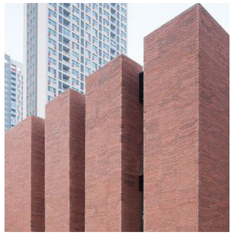
Indicative Palette: Earth





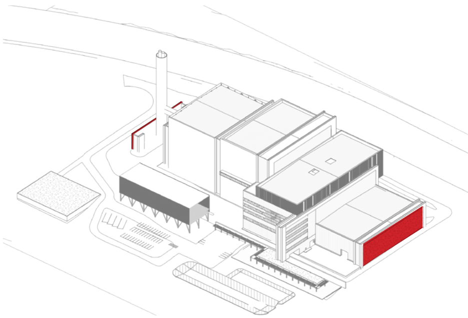






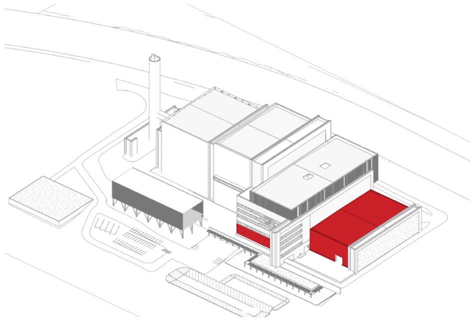
Monolithic 'blades'

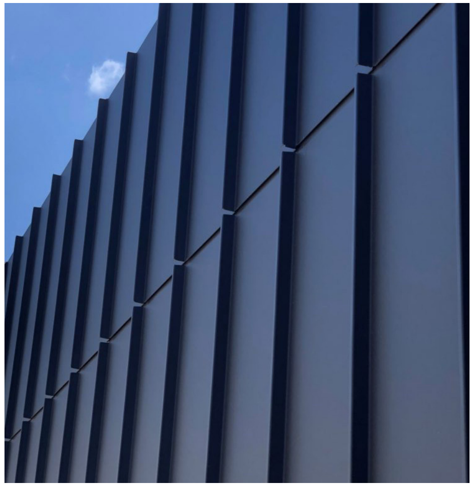
- Monolithic appearance
- Use of subtle textural variation to add visual interest
- Earthy colour palette



Green Walls

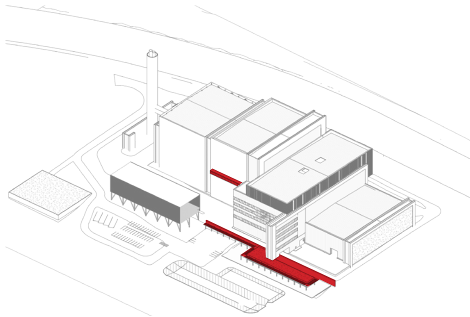
- Opportunity for green walls at far ends of the building to provide further integration with the landscape
- Good means of eliminating reflection from headlights





Waste Receiving Hall

- Notionally dark coloured, matt finish propitiatory walling system
- Uniform, recessive palette
- Opportunity for economic, uniform treatment
- Introduce subdivision though use of expressed seams or joints

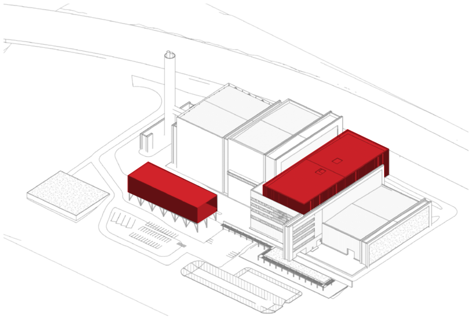


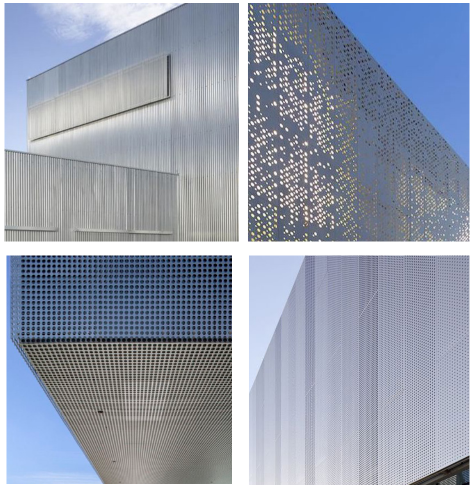
Visitor & Education Centre

- Notionally rammed earth feature wall and timber structure
- Use of warm tactile materials in areas of human contact
- Referencing the natural landscape
- Green roof

Note: All precedent imagery is indicative only

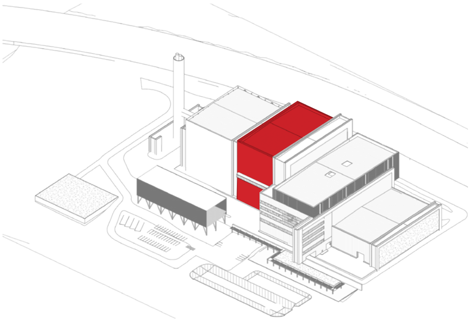
Indicative Palette: Sky

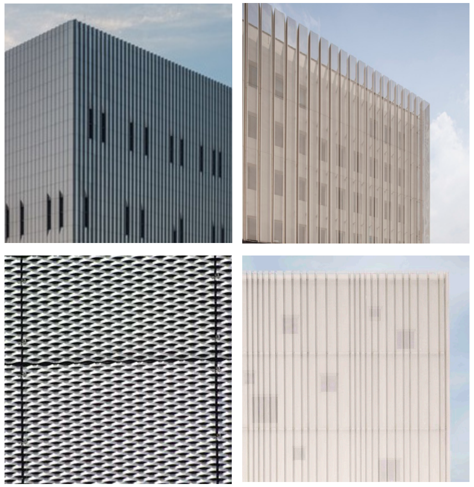




Upper Waste Bunker and ACCs

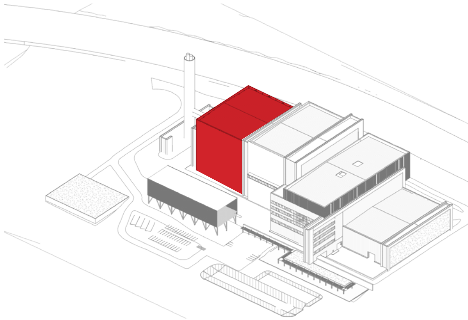
- Notionally perforated metal cladding with simple pattern
- Potential for low-level internal illumination
- Most reflective element in project
- Anticipated subtle sheen to reflect sky conditions.

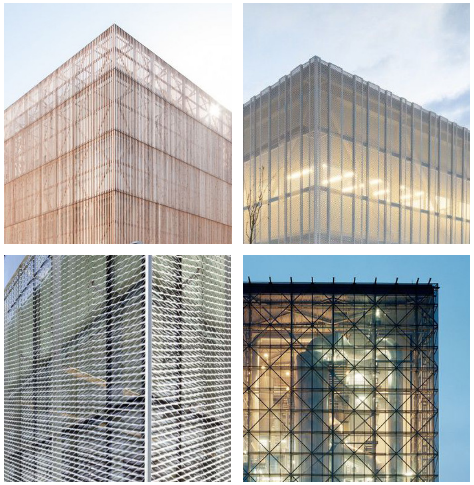




Boiler & Turbine Hall

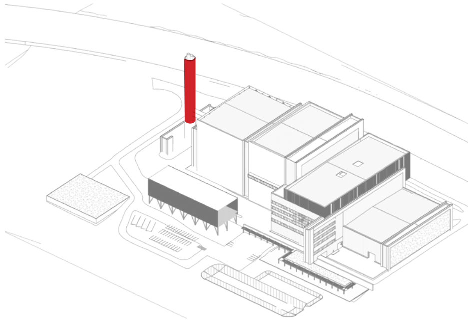
- Notionally opaque screen over solid wall with punched windows behind
- Mediate between the low transparency and higher transparency areas
- Create uniform facade appearance
- Allow subtle level of transparency

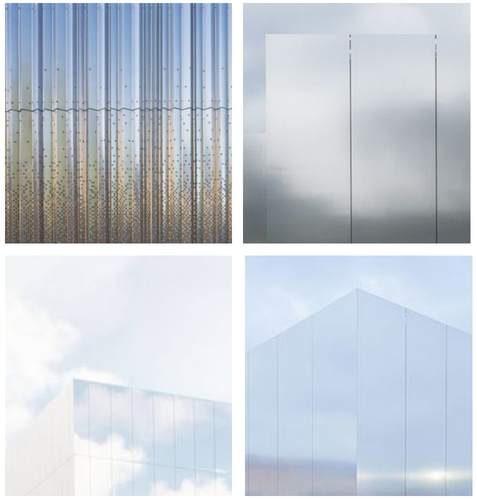




Flue Gas Treatment Hall

- Notionally glazed curtain wall with semi-transparent metal mesh screen
- Internal structure visible and glimpse of internal equipment
- 'Blur' extent of built form through 'layered' transparency
- Allow internal lighting to gently glow through the facade





Stack

- Notionally semi-reflective metal panels with perforation pattern
- Subtly reflect weather conditions and blend into the sky
- Minimal texture
- Well detailed, fine panel joints

Indicative visualisation - Visitor & Education Centre

05
Visitor Experience

Visitor & Education Centre

The Visitor & Education Centre as well as a dedicated visitor tour experience is to be provide as a means of connecting the facility with the public and leveraging the plant as a key educational tool. The Visitor & Educational Centre will be located on the eastern section of the site and includes parking for employees, visitors and busses. This location has been chosen to ensure that pedestrians do not have to cross operational roads on site. A high level enclosed walkway will be constructed for pedestrian passage to the main facility. The Visitor & Education Centre will facilitate guided tours and help educate and inform the community on the circular economy, recycling, resource recovery and process of converting waste to energy.

Visitor Journey

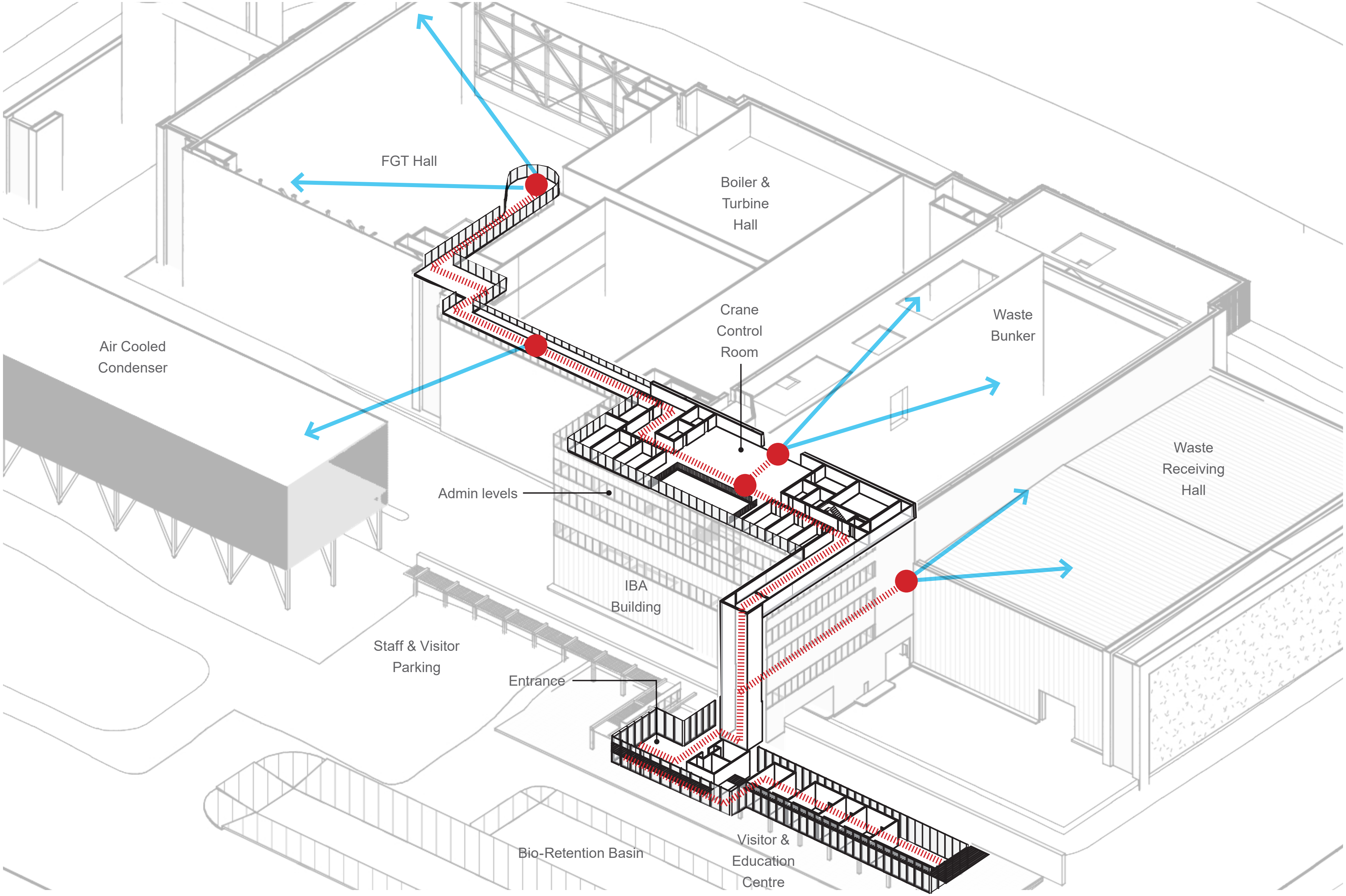
A dedicated visitor tour experience is proposed including an elevated walkway giving views into the process. This is considered world-class, as few other facilities provide such transparency into the process.

The visitor journey is carefully mapped and curated to provide an exemplar guided tour, showcasing every step of the operations and celebrating the process of converting waste to energy.

Visitors are directed along a dedicated route which is separated from areas where personal protective equipment is required. The interior design and fit-out of the habitable areas are to be developed at the next stage.

The visitor journey has several focus points:

1. Visitor Centre
2. Waste Receiving Hall
3. Crane Control Room
4. ACC (Air Cooled Condenser)
5. Flue Gas Treatment Hall



Diagrammatic 3d cutaway view - Mapping the Visitor Journey

NTS

Visitor Journey Mapping

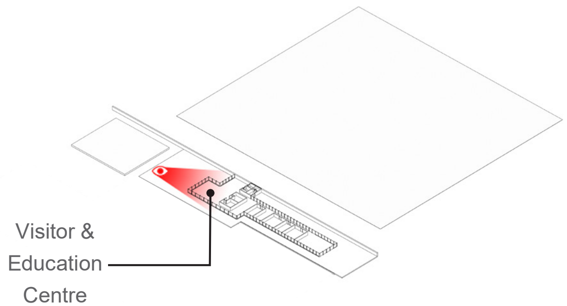
Visitor & Education Centre

Visitors and facilities staff enter the site along a dedicated route, separated from heavy vehicles. The entrance to the facility is share providing equal access for staff, visitors and guests alike.

On entering the Visitor & Education Centre, visitors are directed into a flexible gallery space before embarking on a guided tour of the facility.

Positioned to the east of the main building, the Visitor & Education Centre offers views across the landscaped bio-retention basin where native flora and fauna are encouraged.

Indicative view



Diagramatic 3d cutaway view

Precedents

Brooklyn Botanic Garden Visitor Centre

Vineyard House/Blaanc, Portugal

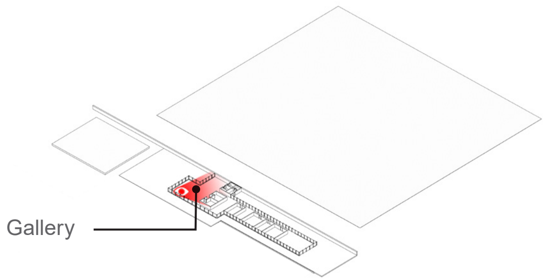
Visitor & Education Centre

The flexible gallery space is provided as a briefing and display area for visitors. Meeting spaces are also provided for breakout sessions, teaching, training and presentations.

Indicative view

Precedents

The Weston Visitor Centre and Gallery, UK

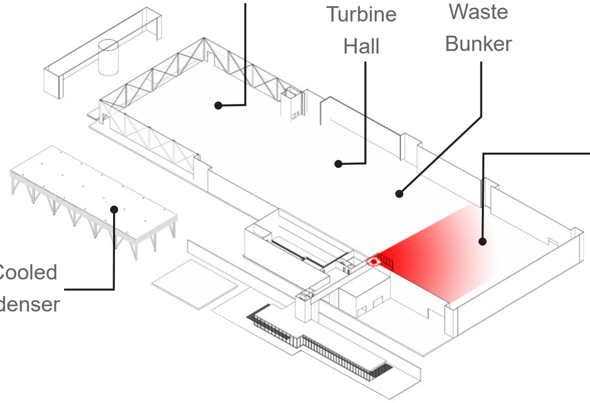


Diagramatic 3d cutaway view

2. Waste Receiving Hall

The dedicated viewing area gives visitors a change to see trucks decanting waste into hoppers as the process begins.

Indicative view



Diagramatic 3d cutaway view

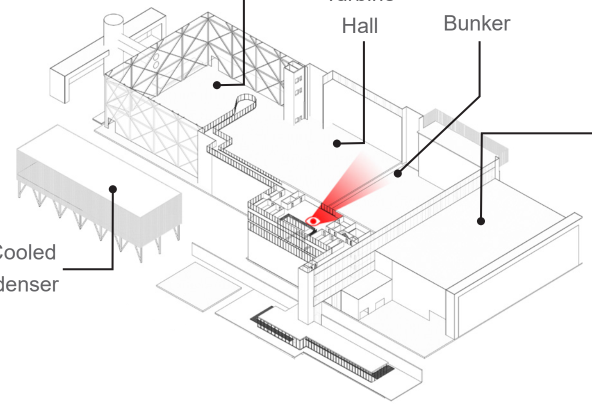
Precedents

Nissin's Kansai Cup Noodle Factory

BMW Welt Guided Tours

3. Crane Control Room

This area allows the visitors to witness the operation of the cranes and the control room.



Diagramatic 3d cutaway view

Indicative view

Precedents

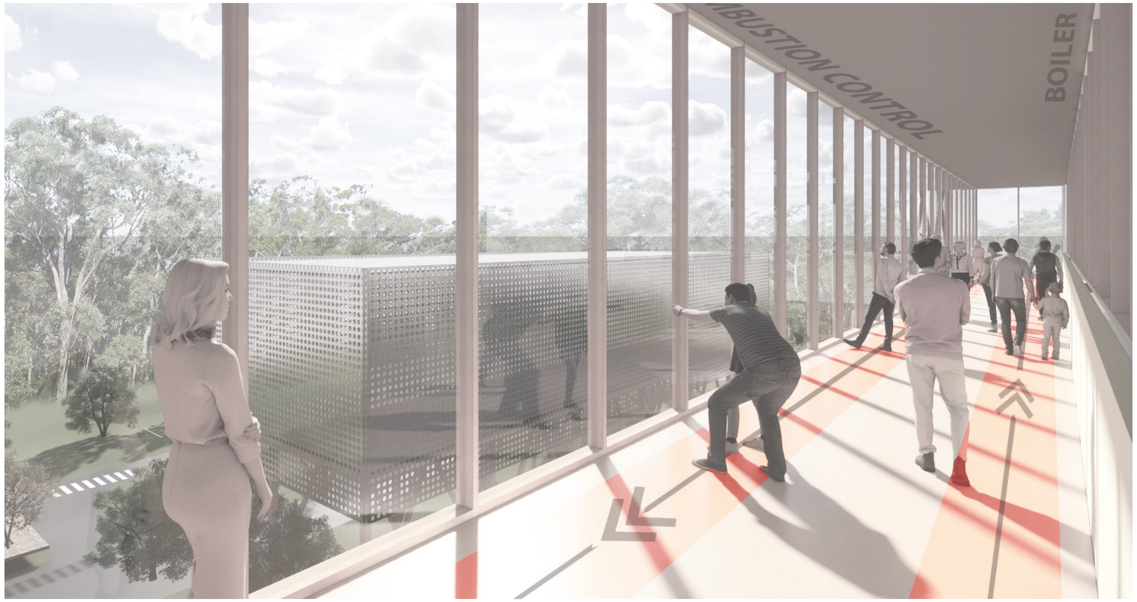
The Gomi Pit Bar, Tokyo

The Gomi Pit Bar, Tokyo

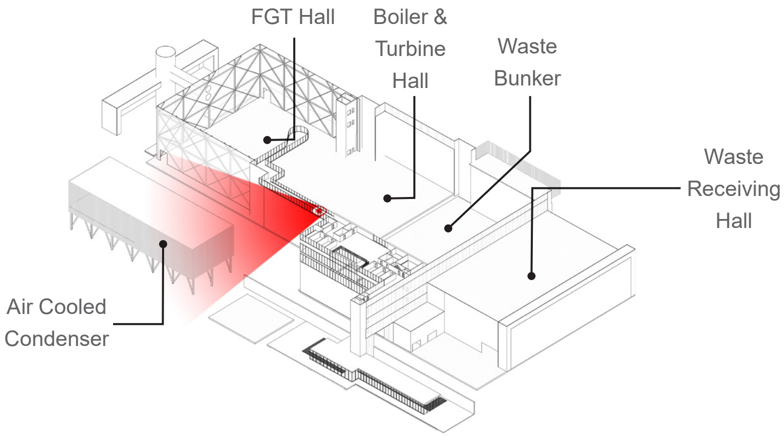
4. ACCs

At this point in the journey, the elevated walkway extends outside of the building connecting the bunker to the flue gas treatment hall.

The link offers views out to the ACCs and the connecting ducts. The walkway also provides elevated views out.



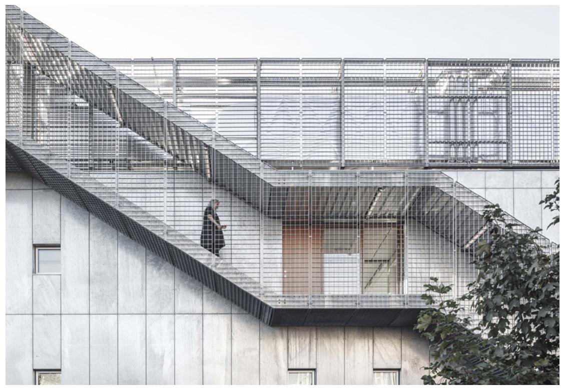
Indicative view



Diagramatic 3d cutaway view

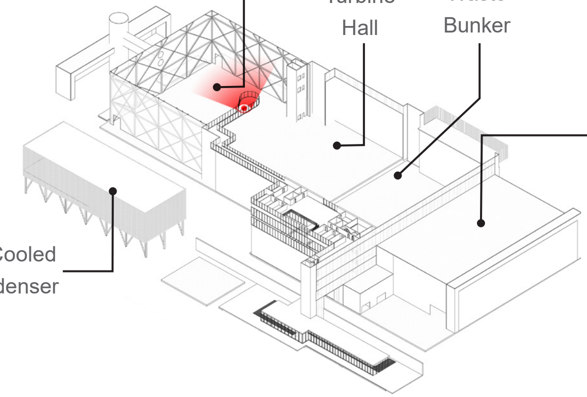
Precedents


Minsheng Wharf Renovation


Sonnesgate 11 building, Denmark

5. Flue Gas Treatment Hall

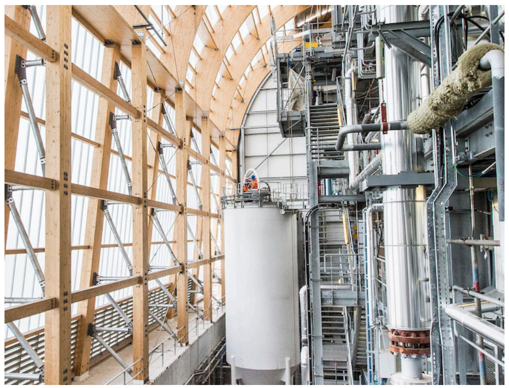
A panoramic lookout into the flue gas treatment hall gives visitors a 'front-row' experience and showcases the impressive array of equipment housed in the flue gas treatment hall.



Diagramatic 3d cutaway view

Indicative view

Precedents



Leeds Plant, UK

Naka Incineration Plant

Indicative visualisation - Landscaping

06 Landscape

Landscape approach

The landscape design meets the Secretary's Environmental Assessment Requirements (SEARs), follows the architectural design approach and incorporates biodiversity recommendations and visual mitigation strategies as described in the following key moves.

Mitigation measures proposed will need to be reviewed to ensure consistency across the Environmental Impact Statement.

SEARs requirements

The Secretary's Environmental Assessment Requirements (SEARs) (SSD 10395) include the following items relevant to the landscape design.

- Details of landscape works that will complement and screen the development showing the use of high-quality landscaping material (12. Visual)
- Consideration of the use of green walls, green roof or cool roof design having regard to the 'Urban Green Cover in NSW Technical Guidelines' (OEH 2015, SEARs 12. Visual)
- Submission of a landscape strategy detailing screen planting and fencing (SEARs 14g)
- Details of design measures to ensure the project has a high design quality and is well presented, particularly in the context of the broader Western Sydney Employment Area.

Architecture response

The following are key points in which the landscape design compliments the architecture.

- Green walls to bookend the facility to the north and south.
- A green roof to the visitors centre.
- The outlook from and around the visitors centre to be attractive for visitors.
- The landscape to assist in 'grounding' the large scale of the building to local features and sympathetic to the landscape.
- Positivity impact local micro-climate through new planting and material selections to mitigate heat sink effects.

Biodiversity recommendations

The following are key points in which the landscape design aligns with biodiversity objectives.

- Use of Cumberland Plain Woodlands species.
- Canopy trees located to allow a connecting passage through the site for native fauna.

LVIA recommendations

The Landscape and Visual Impact Assessment (LVIA), prepared as part of the EIS, provides an assessment of the identified key landscape characters areas, 15 representative viewpoints and discusses impacts associated with lighting and overshadowing. Three photomontages were prepared based on the proposed development to assist in illustrating the general location, scale and relationship of key visual elements with the surrounding landscape. Refer to Chapter 07 Impact Assessment of the LVIA (Viewpoint 3, 7 and 10 under Visual Assessment) to view the photomontages. The LVIA outlines embedded mitigation measures to reduce and manage the impacts of the project on the landscape, views and visual amenity.

Proposed mitigation strategies include:

- Views towards the stack are recommended to require visual screening and embedded mitigation techniques. This includes integrating the design of the stack and blade wall to mitigate visual impact where possible such as careful consideration of the choice of colour and material properties and/or introducing designed elements into the physical design of the stack.
- The incorporation of green walls to both the southern and northern building faces will assist in blending the project into the vegetated backdrop.
- The placement of lighting columns should be considered to ensure light spill is limited to the stack.
- Screening around the perimeter of the site to block direct views and increase density of road side vegetation.

Eastern site boundary, December 2019

Landscape approach

Water capture and treatment

To the eastern side of the site there is an existing overland flow path running from south to north.

The proposed works will include a trapezoid overland flow channel running adjacent the eastern boundary will be maintained with flows separated from site runoff. The channel embankments are to be stabilised with a geotextile and planted with native and riparian grasses. To create a natural appearance and to assist with slowing water flow, rocks and logs of varying sizes are to be placed along the base of the swale. Native canopy trees are to be planted either side, with some placed on the western embankment.

Stormwater and hard-stand run-off will be collected and discharged first to the bioretention basin, before overflowing into the On-Site Detention basin (OSD). Ephemeral planting to the shallow bioretention basin will filter out pollutants, helping mitigate water quality impacts. The bioretention basin will have a permanent shallow pool of water level.

The deeper OSD basin is expected to be empty and dry for long periods, commensurate with local rainfall levels. The basin edges will be planted with recommended species (refer Planting Schedule) for deep marsh, shallow marsh and riparian edge planting appropriate for the level of water.
Filtered site stormwater will discharge from the OSD basin to the overland channel at the north-east corner of the development site in accordance with Blacktown City Council requirements.

Green walls

There are two large green walls proposed that bookend the proposed building to the north and south of the site. The walls will be viewed by traffic travelling on the adjacent M7 freeway, and are intended to soften views of the large building.

- North facing wall: up to 15m in height on the outside of the reception hall. Due to the aspect and size of the green wall, hardy, drought tolerant grass and trailing species are to be selected to provide coverage and have the best chance of tolerant direct sun.
- South facing wall:up to 6m in height, a stand-alone green wall located separate to and south of the Hall, screening utilities and bottom of the tall stack.

The scale and exposure of the green walls will require detailed design that captures irrigation and maintenance requirements. Site specific planting design suitable to the sun exposure (south or north facing) will also be a key design consideration. There are a number of large scale green walls within the Sydney CBD which are successful in their plant coverage and these are good precedent studies for the proposed green walls.

Visitors & Education Centre

The entry driveway and car park will be visually legible, including a more formal and ornamental appearance with avenue trees and mass plantings of native grasses to differentiate from an industrial entry. The carparking is to be framed by garden bed planting and shade trees where space allows and where not conflicting will the function of facilities (i.e. transmission wires and fans).

The Visitor & Education Centre is to have a large wrap around deck that connects to a timber boardwalk over the planted wetland basins to the east. This is to provide a connection from the built form to the landscape. Visitor access and amenities are restricted to the decking area and boardwalk which can incorporate informational signage on wetlands, native fauna and Cumberland Plain Woodland species, to help educate visiting public on the landscape restoration.

Green roof

A green roof is proposed on the visitors centre at the north east of the site. The roof is not proposed to be publicly accessible, though will be a part of the viewing experience from the dedicated visitor walkway.

Proposed planting for the green roof includes a mix of native grasses that link to the surrounding landscape including native grasses as part of the Cumberland Plains Woodland vegetation.

Operational facilities

Within areas of truck deliveries and processing, hard surfaces are to be softened by planted traffic medians, with planting type and placement giving consideration to trafficable areas, sight lines and ensuring no overhanging branches.

Shrubs are to be planted to screen ancillary infrastructure such as the substation and water tanks.

The air cooling condenser (ACC) are adjacent the visitors car park. The large void space beneath the ACCs has a risk of becoming an unsightly area with vegetation not likely to be feasible within the shady conditions. Though this area is likely to be accessed by staff only, its appearance can be enhanced through the use of geometric patterns forming gravel paths and sculptural rocks.

Revegetation area

To the north of the site there is an area set for revegetation of Cumberland Plain Woodland species. The area requires weed control to clear out and stop the spread of noxious species and to allow for the existing overland flow channel to continue through this area. Weed control and revegetation using native grass species is recommended within the right of carriageway, at the north end of the works boundary, though is subject to approval from the adjacent land-owner, SUEZ. The Sydney Water easement is planted with a native grass cover and sedges within the area of overland flow. This will help to suppress weeds whilst allowing for maintenance and access.

Precedent images


Materials and geometry to compliment architecture


Naturalised channel


Green walls


Planted detention basin


Visitors centre green roof


Open woodlands planting

Landscape master plan

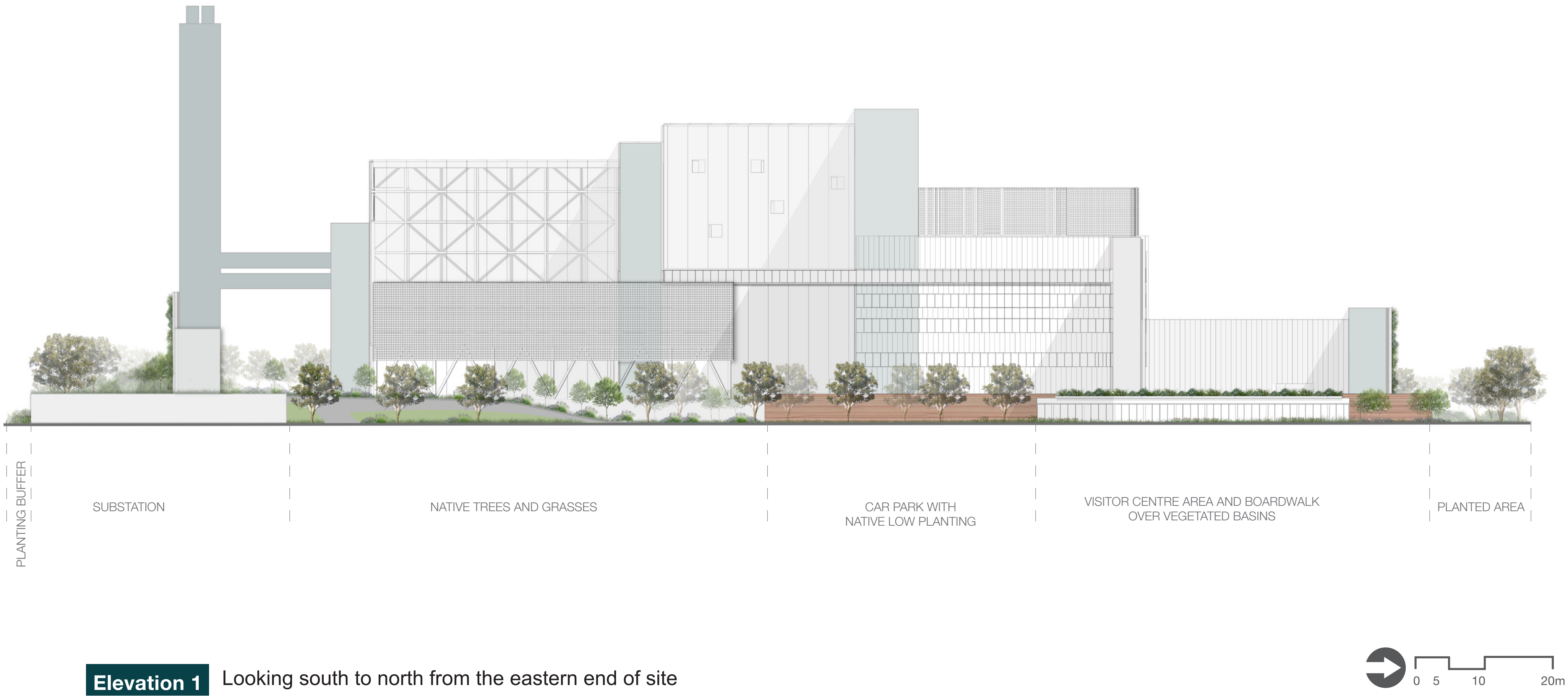
Landscape concept plan

1. Arrival/ Gateway/ Wayfinding: the planting design assists with directing users to the Visitor Centre on arrival to the site. This includes mass native grass planting and maintained native grass lawn. The planting celebrates local identity with use of Cumberland Plain protected ecological community.
2. Shrub planting to the sites boundaries to mitigate visual impacts.
3. Green walls - palette to reflect appropriate species for orientation, integrated irrigation and structural design of the wall and attached planting medium.
4. Cumberland Plain Woodland Revegetation and/or regeneration areas. To restore plant community the area will require weed removal, tubestock planting, monitoring.
5. Revegetation buffer to protect interior of the Cumberland Plain patch. Hardy species to minimse weed risk from visitors visiting the site and traffic entering and exiting.
6. Biorention basin(6a) and on-site detention basin (6b): Macrophytes/Grasses/Sedges introduced to improve water quality and create habitats where possible. Species to reflect local character, and appropriate for predicted water flows. Bioretention basin is a dry basin for most of the time - species with long roots to cater for inundation.
7. Overland flow channel: embankments covered with native grasses and toe of swale to contain riparian planting with occasional boulders and woody debris to assist with slowing water movement and naturalisation.
8. Native grass lawn - lawn area sown with native grass mix suitable for regular mowing
9. Green roof - a native grassland species green roof is proposed to the top of the visitors centre
10. Sculpture path - geometric path layout beneath ACC with sculptural boulders and stone benches intersecting with varying gravel path colour/textures
11. Boardwalk - a timber boardwalk leading out from the visitors centre over the vegetated basins.
12. Revegetation area: additional Cumberland Plain Woodland species after weed control treatment to area. The overland flow channel will continue to flow through this existing depression, planted with ephemeral grass species.

LEGEND

- Extent of works boundary
- Existing native trees to be retained
- Proposed native trees
- Proposed shrubs & groundcovers
- Native grassed lawn
- Rocks and timber logs within channel
- Gravel area
- Hardstand
- Boardwalk


WESTLINK M7
(TOLL ROAD)
TfNSW LAND
(EMBANKMENT)
Elevation 1
TRUCK DECOUPLING AREA
WEIGHBRIDGES (INCOMING)
ENTRANCES TRUCKS
KIOSK
EXISTING
ENTRY DRIVE
RW
STACK
QUARANTINE LAYBY
FGT HALL
BOILER &
TURBINE HALL
WASTE BUNKER
WASTE
RECEIVING HALL
RIGHT OF CARRIAGEWAY
RIGHT OF CARRIAGEWAY
RW
TRUCK COUPLING AREA
WEIGHBRIDGES (OUTGOING)
KIOSK
AIR COOLED CONDENSER
REVEGETATION AREA
VISITOR &
EDUCATION CENTRE
SUBSTATION
SYDNEY WATER EASEMENT
Elevation 2
WEED CONTROL AND REVEGETATION WORKS
WITHIN EASEMENT SUBJECT TO SUEZ APPROVAL
NEIGHBOURING PROPERTY
(Global Renewables)
0 5 10 25m



Elevation 1 Looking south to north from the eastern end of site

Elevation 2 Looking west to east from the southern end of site

Indicative planting palette

Species within the threatened Cumberland Plain Woodland vegetation class are indiginous to the project site. The existing site is degraded, containing many weed species. It is the aim of the planting design to restore and celebrate this native vegetation by use of tree, shrub, grass and riparian species.

Indicative species have been included and will be developed in further detail during the future design stages. The following references have been used to identify planting species.

- Native Vegetation of the Cumberland Plain, Shale Plains Woodland 2015
- Blacktown City Council Bioretention Planting Guide 2019
- Blacktown City Council Riparian Planting Guide
- Blacktown City Council Wetland Planting Guide 2019
- Western Sydney Parklands Design Manual

Green wall species are to be selected at detailed design phase in consultation with proven species used on green walls within Sydney. Species selection for north-facing walls will be hardy species including native grasses and tufting species. Species for the south-facing wall will likely include ferns, trailing plants and tufting species.

Canopy trees

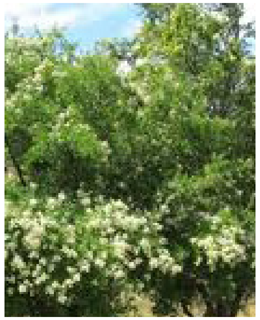
Eucalyptus moluccana
Grey Box

Eucalyptus tereticornis
Forest Red Gum

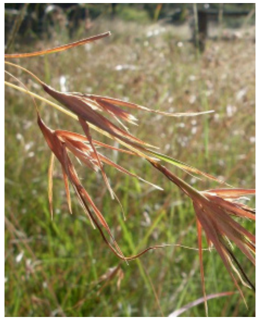
Tristaniopsis laurina
Water Gum

Melaleuca decora
White feathered honey myrtle

Shrubs/groundcovers



Bursaria spinosa
Blackthorn

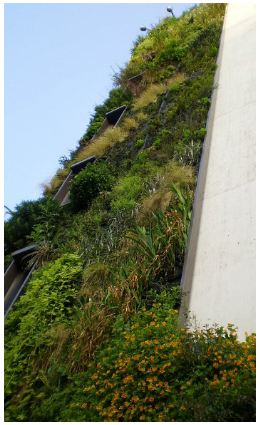


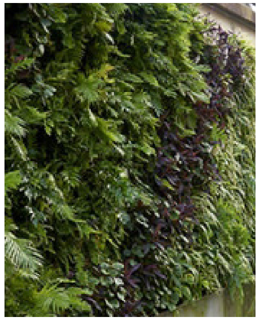
Themeda trianda
Kangaroo Grass

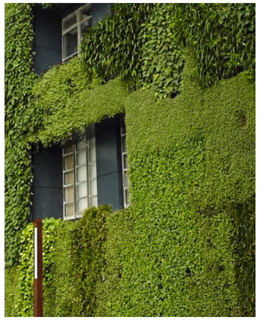
Westringia fruiticosa
Native Rosemary

Lomandra longifolia
Mat-rush

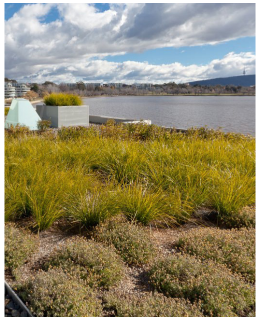
Green walls



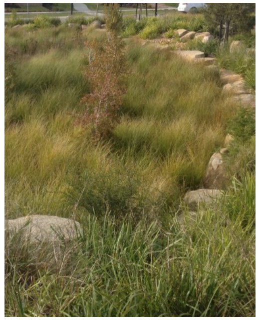




Green roof



Ephemeral areas



Planting schedule

PROPOSED SPECIES		
*Eucalyptus moluccana | Grey Box	20-30m H x 15-20m W	Tree | Canopy
*Eucalyptus tereticornis | Forest Red Gum	18-45m H x 10-20m W	Tree | Canopy
*Eucalyptus crebra | Narrow-leaved Ironbark	18-35m H x 10-20m W	Tree | Canopy
*Corymbia maculata | Spotted Gum	30m H x 10m W	Tree | Canopy
*Eucalyptus eugenioides | Thin-leaved Stringybark	25m H x 10m W	Tree | Canopy
Melaleuca decora | White feathered honey myrtle	10m H x 6m W	Tree | Canopy
Tristaniopisi laurina | Water Gum	8m H x 3m W	Medium tree
*Bursaria spinosa | Blackthorn	5-10m H x 3m W	Understorey | Shrub
*Dodonaea viscosa subsp. cuneata	5-10m H x 3m W	Understorey | Shrub
Exocarpos cupressiformis | Cypress Cherry	3-8m H x 3m W	Understorey | Shrub
*Dianella longifolia | Flax Lily	0.5m H x 0.5m W	Understorey | Shrub
Ficinia nodosa | Knobby club rush	0.5m H x 0.5m W	Understorey | Shrub
Leptospermum patersonii | Lemon-scentred Tea Tree	4m H x 3m W	Understorey | Shrub
*Lomandra filiformis subsp. filiformis | Matrush	0.5m H x 0.3m W	Understorey | Shrub
Lomandra longifolia | Matrush	0.6m H x 0.5m W	Understorey | Shrub
Lomandra multiflora | Common Matrush	0.5m H x 0.5m W	Understorey | Shrub
Melaleuca thymfolia | Thyme honey myrtle	1.0m H x spreading	Understorey | Shrub
Grevillea junipera subsp. Junipera \ Juniper-leaved grevillea	0.6m H x spreading	Understorey | Shrub
Poa labillidieri | Tussock Grass	0.6m H x 0.5m W	Understorey | Shrub
Westringia fruticosa | Coastal rosemary	1-2m H x 1.5m W	Understorey | Shrub
Dichondra repens | Kidney Weed	0.1m H x spreading	Understorey | Shrub
Wahlenbergia gracilis | Australian Bluebell	0.3m H x 0.3m W	Understorey | Shrub
*Bothriochloa macra | Red Grass		Understorey | Grass
*Austrodanthonia racemosa var. racemosa | Wallaby Grass		Understorey | Grass
*Microlaena stipoides var. stipoides | Weeping Meadow Grass		Understorey | Grass
Themeda australis | Kangaroo Grass		Understorey | Grass

* Cumberland Plain Woodland species (to be prioritised in planting schedule)

Source:

Blacktown City Council, Riparian planting guide 2019

Tozer.M. NSW National Parks and Wildlife Service (2015) The native vegetation of the Cumberland Plain, western Sydney; systematic classification and field identification of communities, Map sheeet 10

NSW Bionet vegetation classification database

BIORETENTION BASIN PROPOSED SPECIES	
Isolepsis nodosa | Knobby club rush	Edge (dry)
Lomandra longifolia | Spiny-head mat-rush	Edge (dry)
Poa labillardieri | Tussock grass	Edge (dry)
Carex appressa | Tall sedge	Edge (wet)
Cyperus exaltus| Cyperus	Edge (wet)
Juncus usitatus | Juncus	Edge (wet)
Baumea articulata| Jointed rush	Shallow marsh
Bolboschoenus caldwellii | Marsh club rush	Shallow marsh
Bolboschoenus fluviatilis | River bulrush	Shallow marsh
Eleocharis acuta | Spikerush	Shallow marsh
Philydrum lanuginosum | Woolly waterlilies	Shallow marsh
Baumea articulata | Jointed rush	Deep marsh
Eleocharis sphacelata | Tall spike-rush	Deep marsh
Schoenoplectus mucronatus | Bog Bulrush	Deep marsh

Source: Blacktown City Council, Wetland planting guide 2019

A
Architectural drawings

A1

29/06/2020 12:34:35 PM

NOT FOR CONSTRUCTION

Scales

SCALE 0m 50 100 250 500

Filename (Full Drawing No)

WSERRC- ARU-SYD-AR-GN-DRG-1001

Design Model Version

Issue	Date	By	Chkd	Appd
A	29.06.2020	SP	BP/LS	JO

Issue	Date	By	Chkd	Appd

Issue	Date	By	Chkd	Appd

Client

CLEANAWAY
Making a sustainable future possible

MACQUARIE

Nominated Architect:
Name: Belinda Lee Parker Date: ....
Registered Architect NSW 9729

Job Title
WSERRC
339 Wallgrove Road, Eastern Creek

Scale at A1 1 : 5000

Discipline
Architecture Drawings

ARUP

Arup, Barrack Place, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61(02)9320 9320 Fax +61(02)9320 9321
www.arup.com

CONSULT AUSTRALIA
Member Firm
Arup Pty Ltd
ABN 18 000 966 165

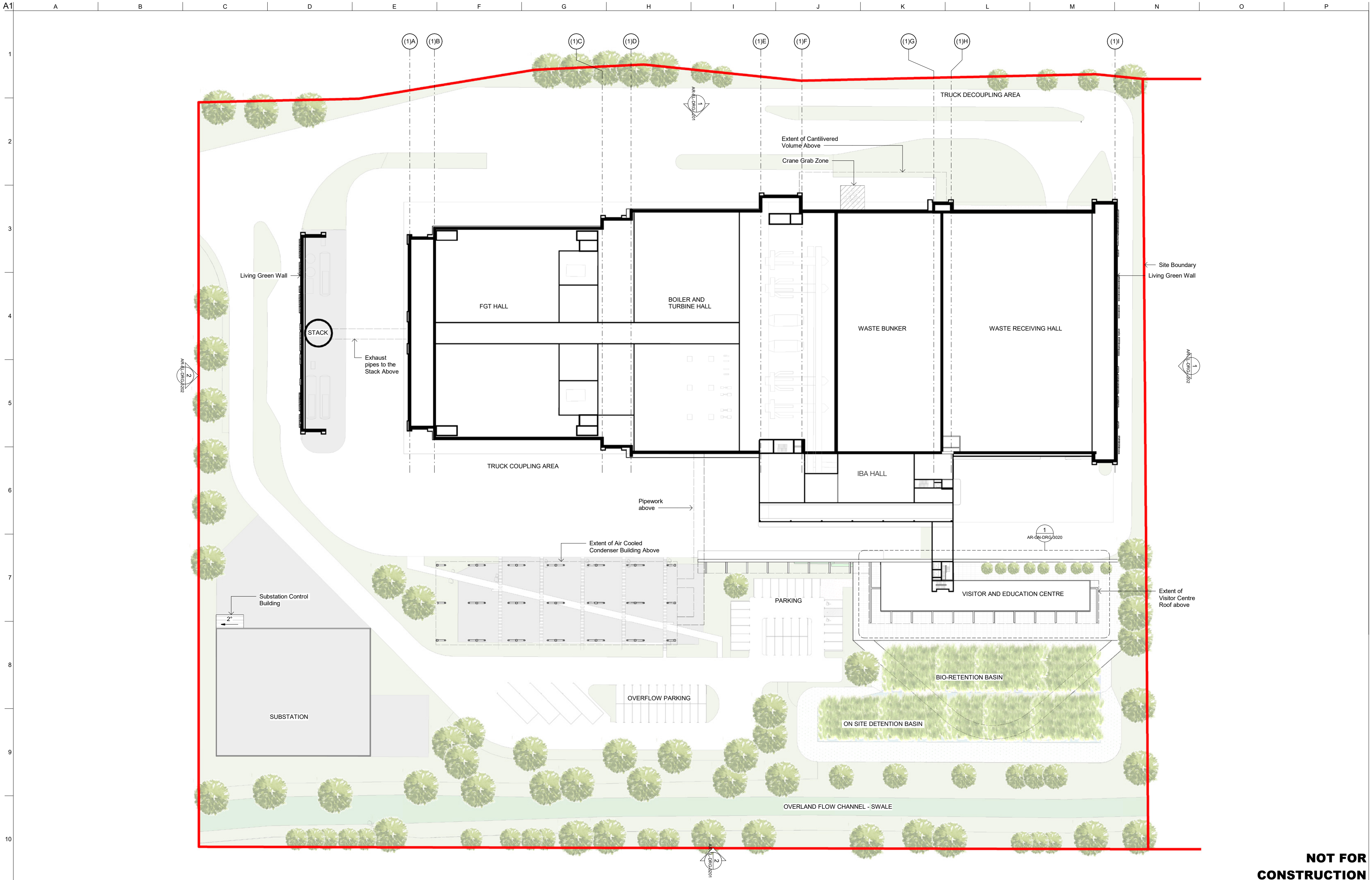
Drawing Title
General Arrangement - Plan
Site Location Plan

Drawing Status
ISSUED FOR APPROVAL

Job No	Drawing No	Issue
264039	AR-GN-DRG-1001	A

Do not scale Drafted By: Drafting Checked:

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR



NOT FOR CONSTRUCTION

Scales

SCALE 0m 5 10 25 50

Filename (Full Drawing No)
WSERRC- ARU-SYD-AR-GN-DRG-3001
Design Model Version

Issue	Date	By	Chkd	Appd
A	29.06.2020	SP	BP/LS	JO

Client
CLEANAWAY Making a sustainable future possible
MACQUARIE

Nominated Architect:
Name: Belinda Lee Parker
Registered Architect NSW 9729
Date:

Job Title
WSERRC 339 Wallgrove Road, Eastern Creek

Scale at A1 1 : 500

Discipline
Architecture Drawings

ARUP
Arup, Barrack Place, Level 5, 151 Clarence St Sydney, NSW, 2000
Tel +61(02)9320 9320 Fax +61(02)9320 9321
www.arup.com

CONSULT AUSTRALIA
Member Firm
Arup Pty Ltd ABN 18 000 966 165

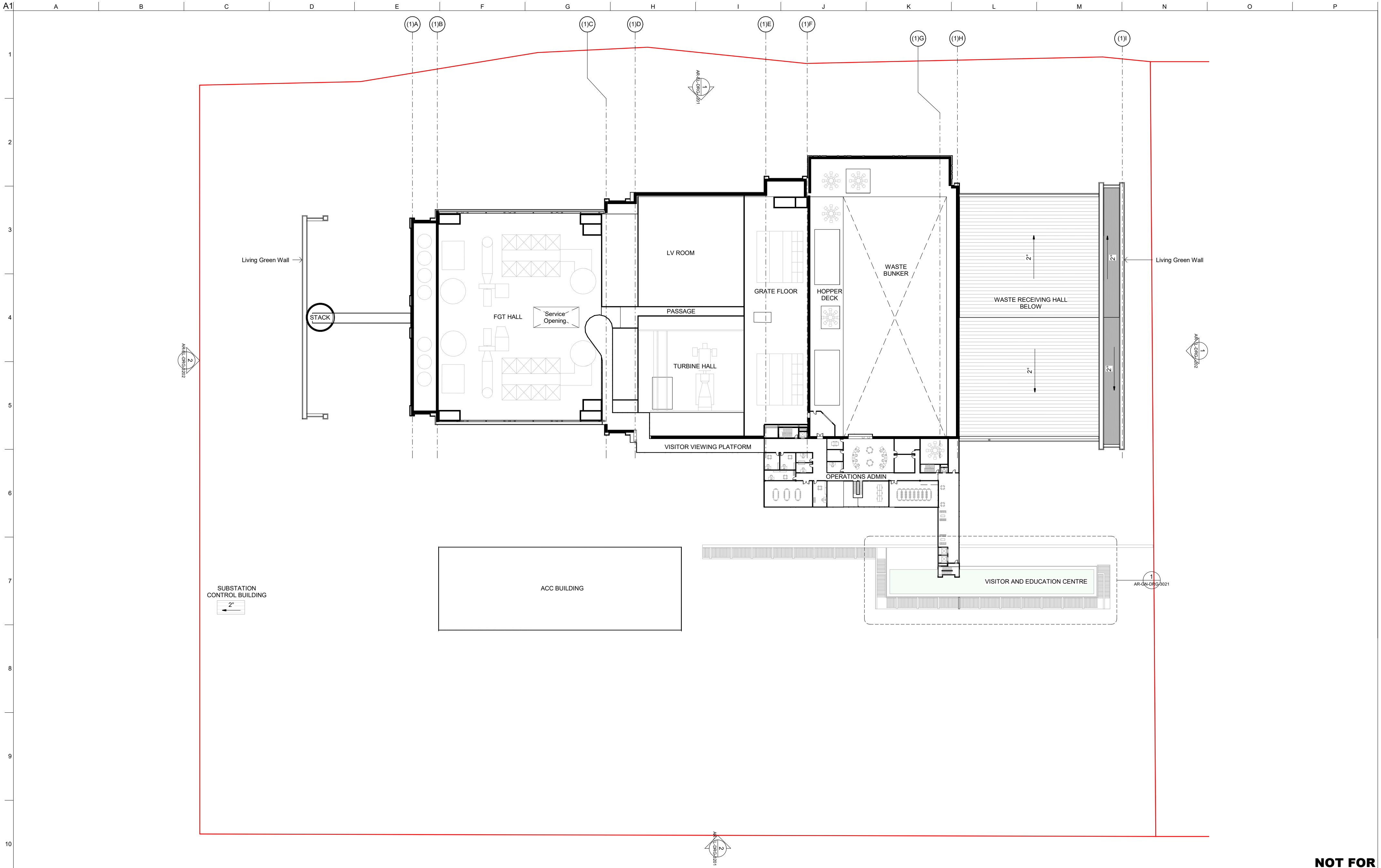
Drawing Title
General Arrangement - Plan Lower Ground Level

Drawing Status
ISSUED FOR APPROVAL

Job No 264039
Drawing No AR-GN-DRG-3001
Issue A

Do not scale
Drafted By:
Drafting Checked:
DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

29/06/2020 5:11:58 PM



NOT FOR CONSTRUCTION

Scales

SCALE 0m 5 10 25 50

Filename (Full Drawing No)
WSERRC- ARU-SYD-AR-GN-DRG-3005
Design Model Version

Issue	Date	By	Chkd	Appd
A	29.06.2020	SP	BP/LS	JO

Client: CLEANAWAY — Making a sustainable future possible; MACQUARIE

Nominated Architect:
Name: Belinda Lee Parker Date: ....
Registered Architect NSW 9729

Job Title
WSERRC
339 Wallgrove Road, Eastern Creek

Scale at A1 1 : 500

Discipline: **Architecture Drawings**

ARUP
Arup, Barrack Place, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61(02)9320 9320 Fax +61(02)9320 9321
www.arup.com

CONSULT AUSTRALIA
Member Firm
Arup Pty Ltd
ABN 18 000 966 165

Drawing Title
General Arrangement - Plan Level 4

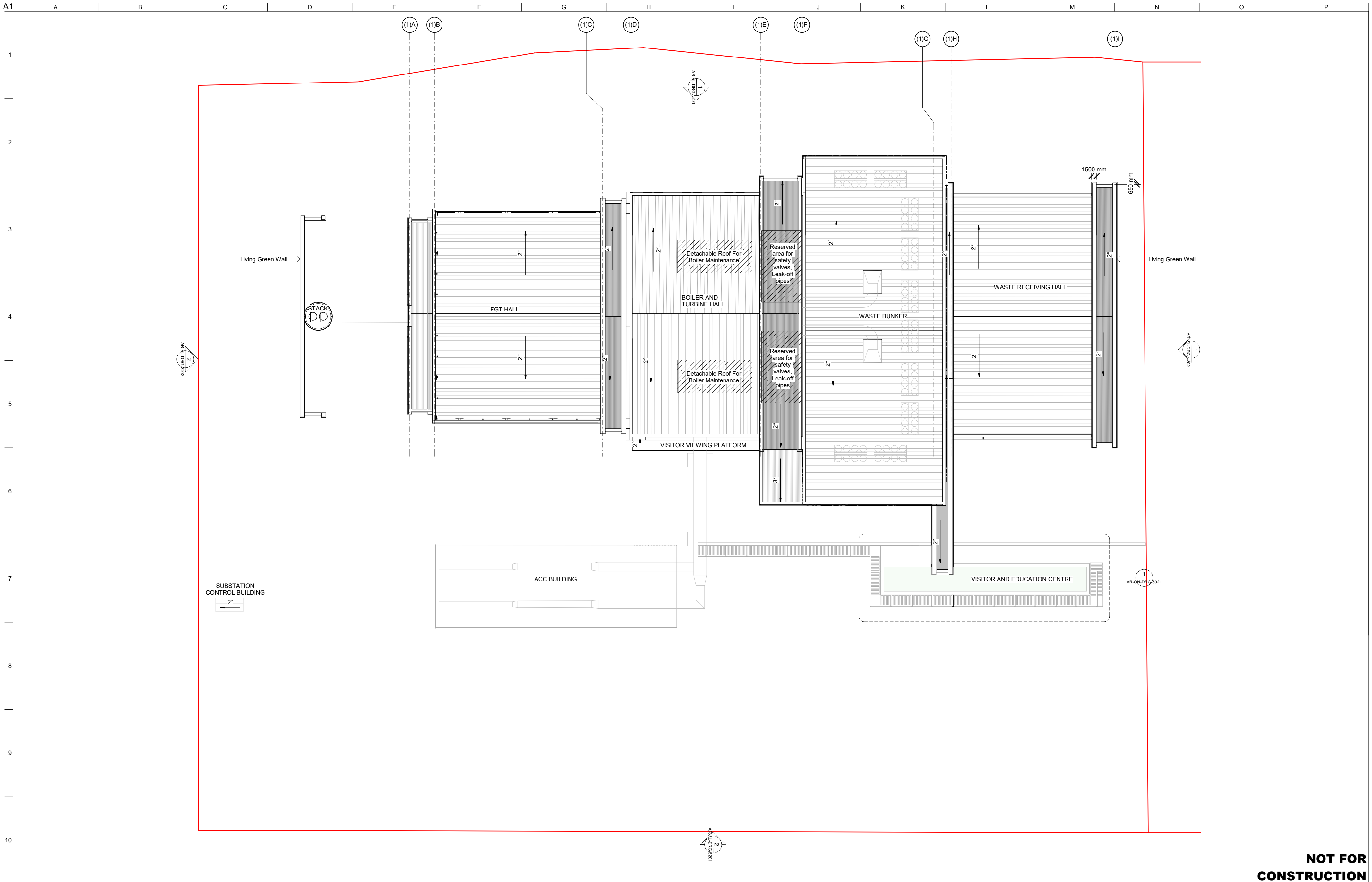
Drawing Status
ISSUED FOR APPROVAL

Job No	Drawing No	Issue
264039	AR-GN-DRG-3005	A

Do not scale   Drafted By: Drafting Checked:

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

29/06/2020 5:05:11 PM



NOT FOR CONSTRUCTION

Scales

SCALE 0m 5 10 25 50

Filename (Full Drawing No)
WSERRC- ARU-SYD-AR-GN-DRG-3006
Design Model Version

Issue	Date	By	Chkd	Appd
A	29.06.2020	SP	BP/LS	JO

Client: CLEANAWAY — Making a sustainable future possible; MACQUARIE

Nominated Architect:
Name: Belinda Lee Parker Date: ....
Registered Architect NSW 9729

Job Title
WSERRC
339 Wallgrove Road, Eastern Creek

Scale at A1: 1 : 500

Discipline: **Architecture Drawings**

ARUP

Arup, Barrack Place, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61(02)9320 9320 Fax +61(02)9320 9321
www.arup.com

CONSULT AUSTRALIA
Member Firm
Arup Pty Ltd
ABN 18 000 966 165

Drawing Title
General Arrangement - Plan
Roof Plan

Drawing Status
ISSUED FOR APPROVAL

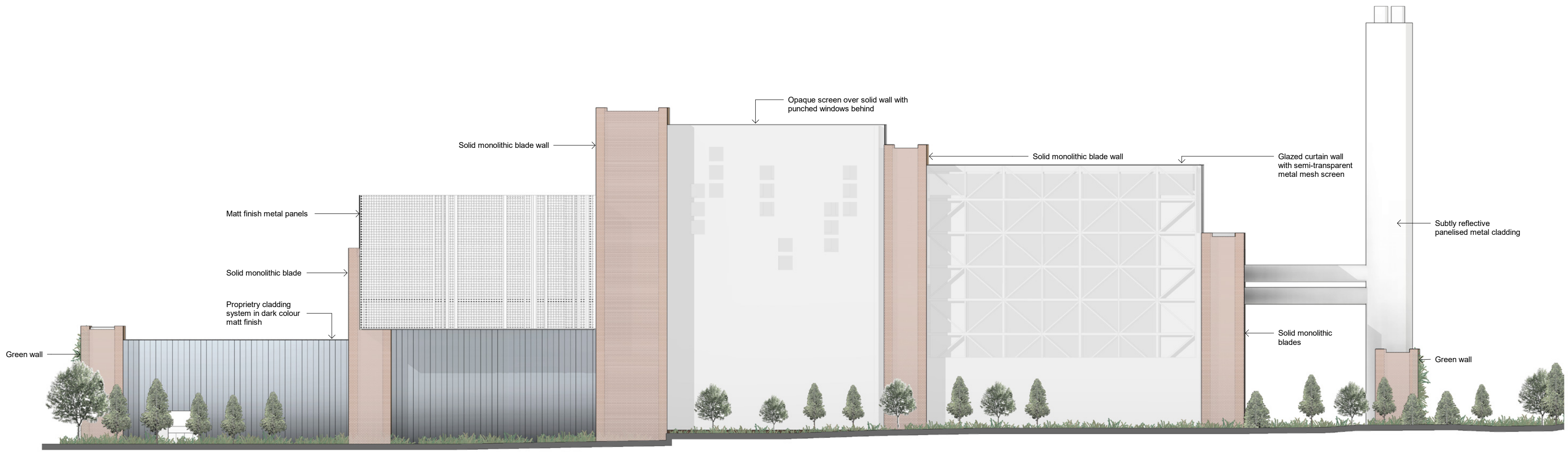
Job No	Drawing No	Issue
264039	AR-GN-DRG-3006	A

Do not scale   Drafted By: Drafting Checked:

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

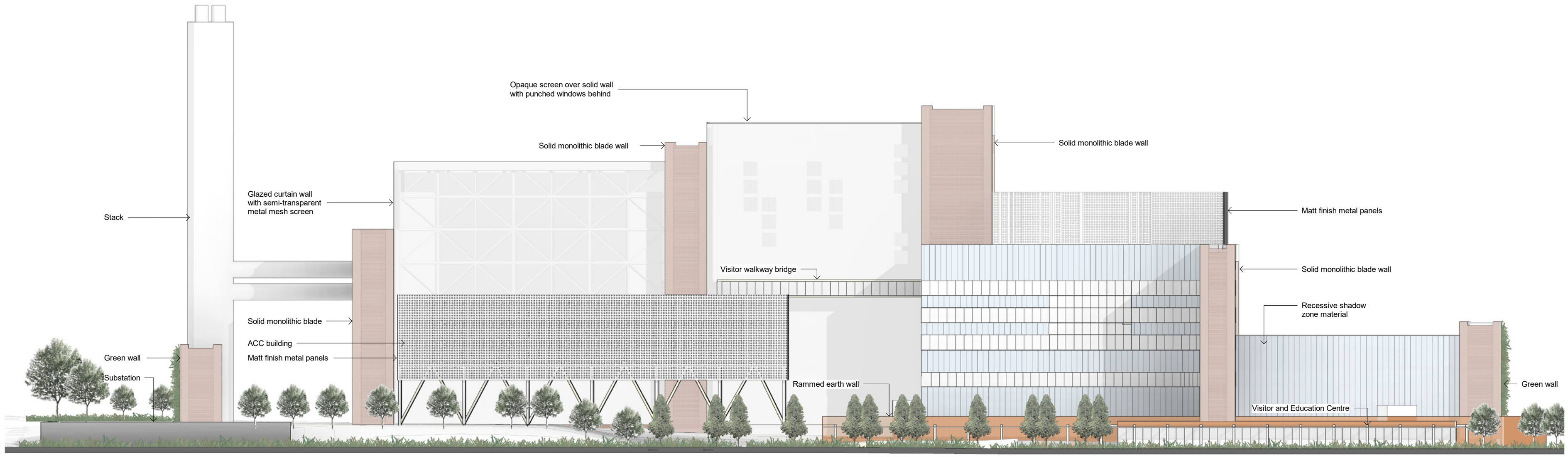
29/06/2020 5:06:17 PM

A1



1- Elevation - A

Scale 1 : 400



2- Elevation - B

Scale 1 : 400

NOT FOR CONSTRUCTION

Scales

Filename (Full Drawing No)
WSERRC- ARU-SYD-AR-EL-DRG-3201
Design Model Version

Issue	Date	By	Chkd	Appd
A	29.06.2020	SP	BP/LS	JO

Client
CLEANAWAY
Making a sustainable future possible
MACQUARIE

Nominated Architect:
Name: Belinda Lee Parker Date: ....
Registered Architect NSW 9729

Job Title
WSERRC
339 Wallgrove Road, Eastern Creek

Scale at A1 1 : 400

Discipline
Architecture Drawings

ARUP
Arup, Barrack Place, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61(02)9320 9320 Fax +61(02)9320 9321
www.arup.com

CONSULT AUSTRALIA
Member Firm
Arup Pty Ltd
ABN 18 000 966 165

Drawing Title
General Arrangement Elevations

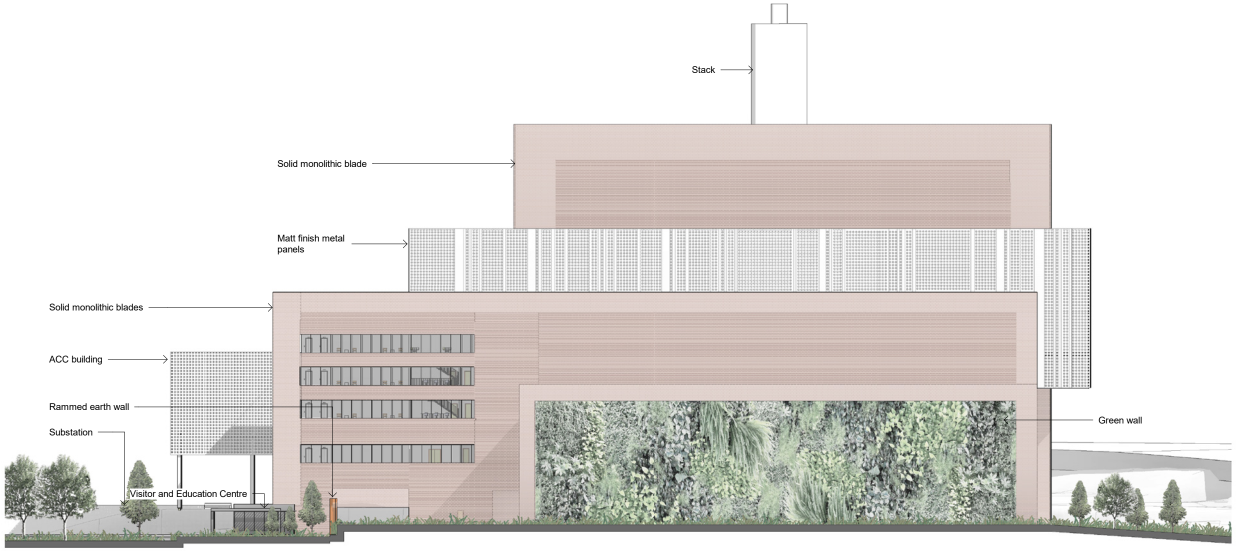
Drawing Status
ISSUED FOR APPROVAL

Job No	Drawing No	Issue
264039	AR-EL-DRG-3201	A

Do not scale Drafted By: Drafting Checked:

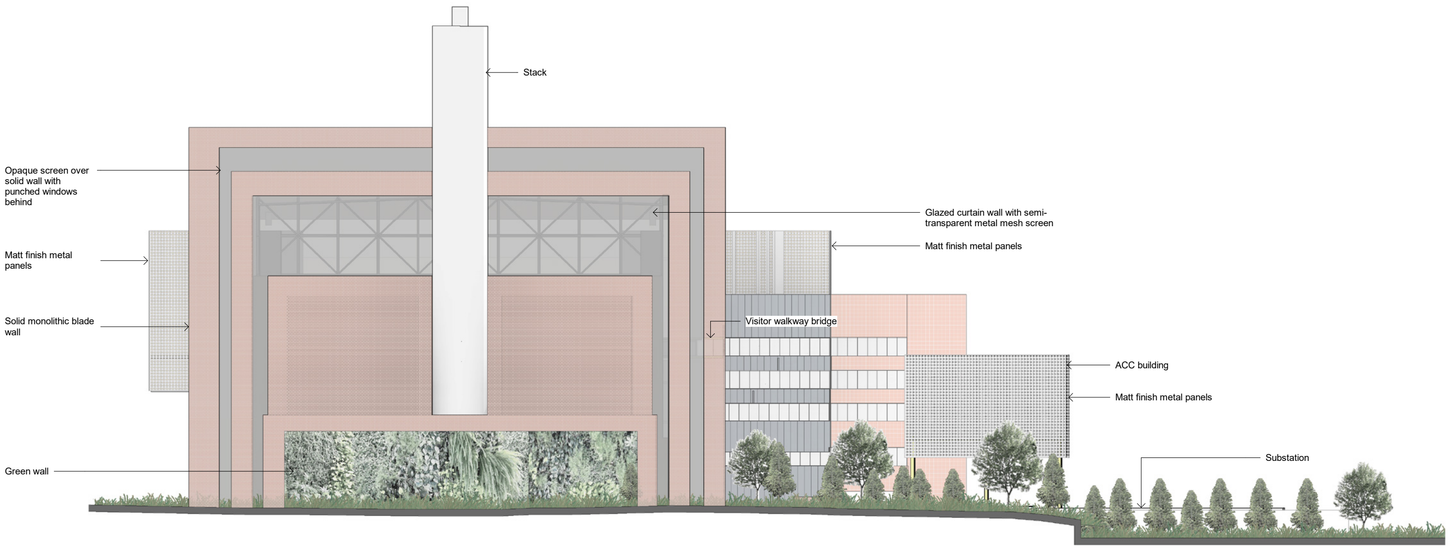
DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

29/06/2020 12:33:21 PM



1- Elevation - C

Scale 1 : 400



2- Elevation - D

Scale 1 : 400

NOT FOR CONSTRUCTION

Scales

Filename (Full Drawing No)
WSERRC- ARU-SYD-AR-EL-DRG-3202
Design Model Version

Issue	Date	By	Chkd	Appd
A	29.06.2020	SP	BP/LS	JO

Client: CLEANAWAY Making a sustainable future possible / MACQUARIE

Nominated Architect:
Name: Belinda Lee Parker Date: ....
Registered Architect NSW 9729

Job Title
WSERRC
339 Wallgrove Road, Eastern Creek

Scale at A1: 1 : 400

Discipline: **Architecture Drawings**

ARUP

Arup, Barrack Place, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61(02)9320 9320 Fax +61(02)9320 9321
www.arup.com

CONSULT AUSTRALIA
Member Firm
Arup Pty Ltd
ABN 18 000 966 165

Drawing Title
General Arrangement Elevations

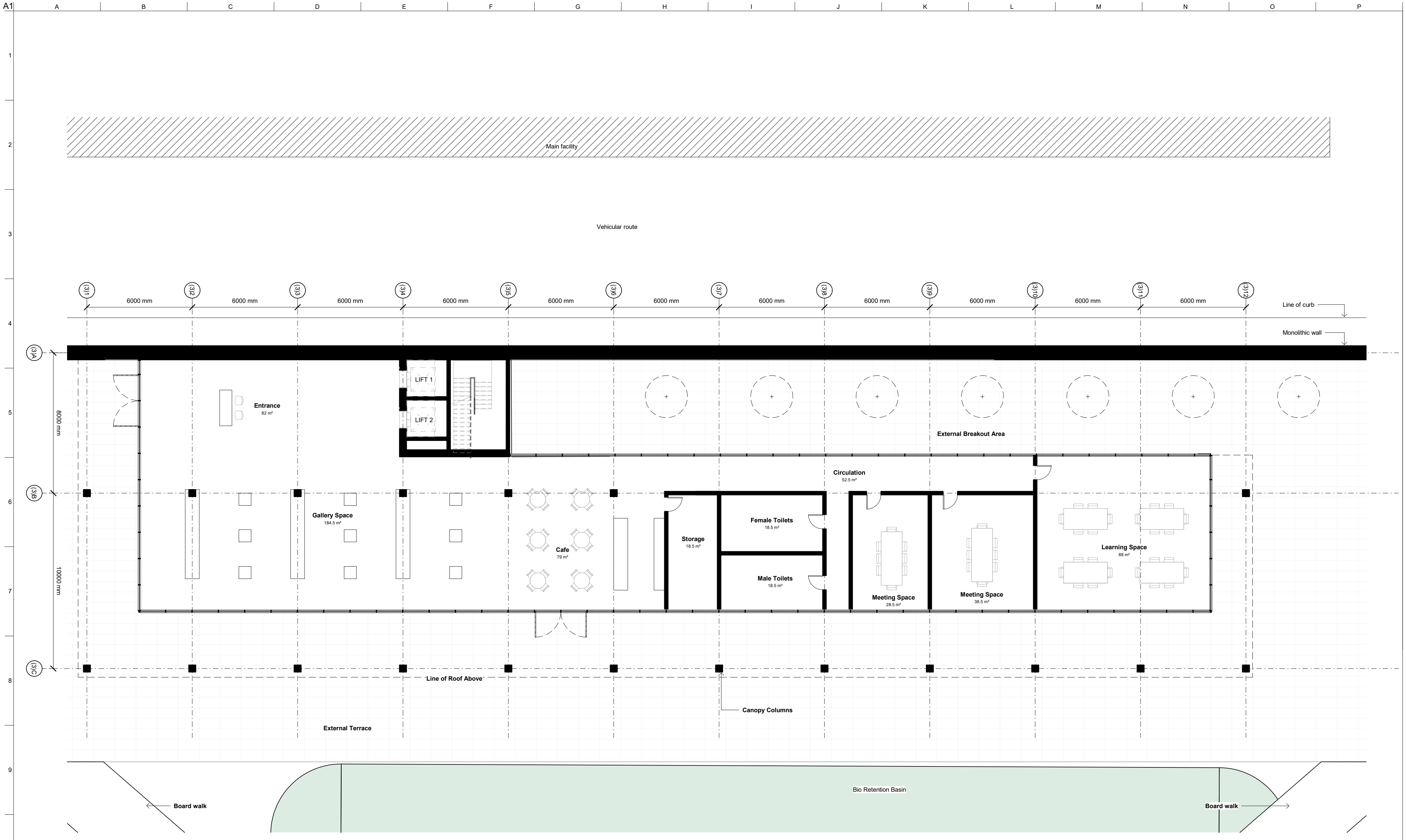
Drawing Status
ISSUED FOR APPROVAL

Job No	Drawing No	Issue
264039	AR-EL-DRG-3202	A

Do not scale   Drafted By: Drafting Checked:

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

29/06/2020 12:34:17 PM



NOT FOR CONSTRUCTION

Scales

SCALE 0m 1 2 5 10

Filename (Full Drawing No)
WSERRC- ARU-SYD-AR-GN-DRG-3020
Design Model Version

Issue	Date	By	Chkd	Appd
A	29.06.2020	SP	BP/LS	JO

Client: CLEANAWAY — Making a sustainable future possible; MACQUARIE

Nominated Architect:
Name: Belinda Lee Parker   Date: ....
Registered Architect NSW 9729

Job Title
WSERRC
339 Wallgrove Road, Eastern Creek

Scale at A1: 1 : 100

Discipline: **Architecture Drawings**

ARUP

Arup, Barrack Place, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61(02)9320 9320 Fax +61(02)9320 9321
www.arup.com

CONSULT AUSTRALIA
Member Firm
Arup Pty Ltd
ABN 18 000 966 165

Drawing Title
General Arrangement - Plan
Visitor Centre
Ground Level

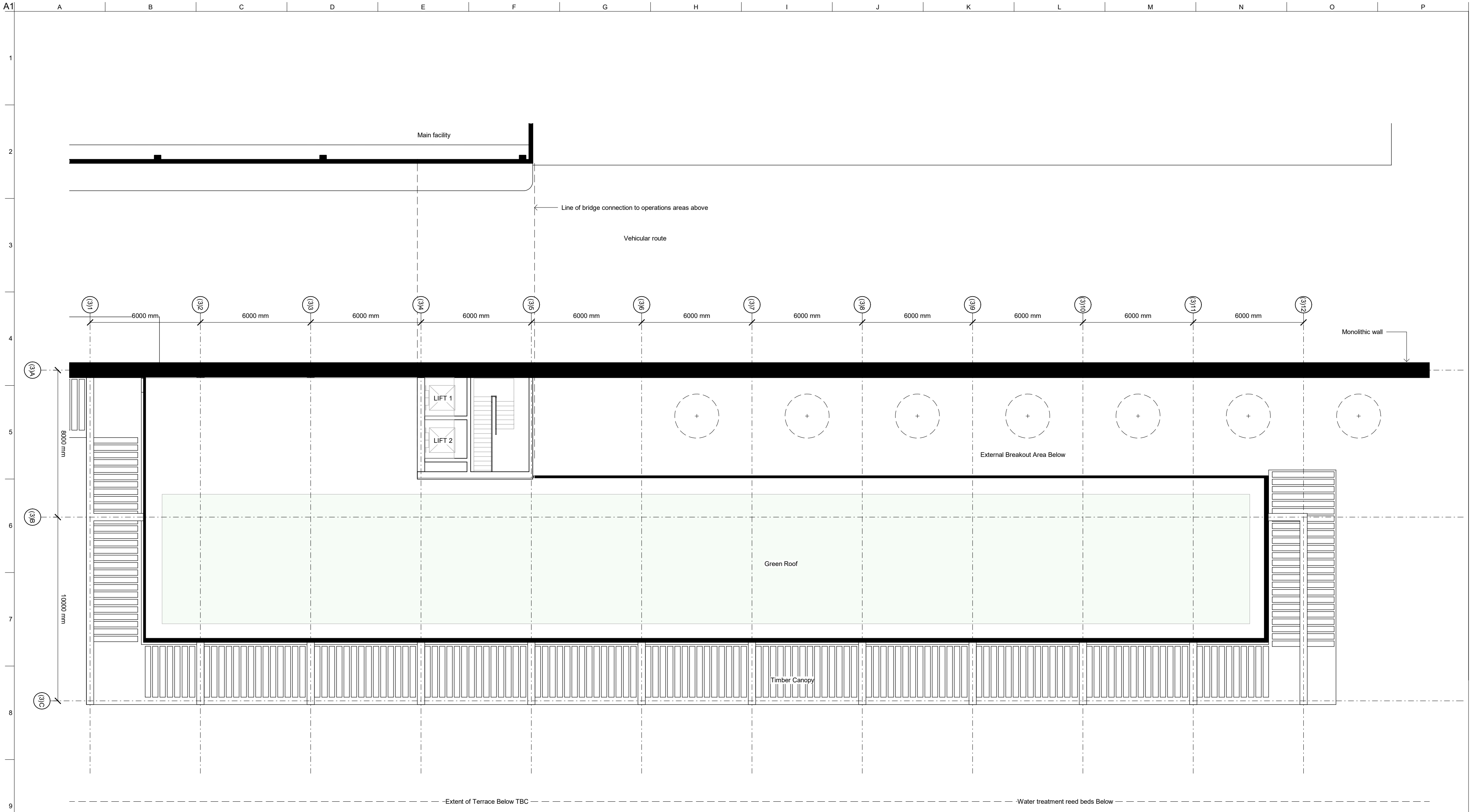
Drawing Status: **ISSUED FOR APPROVAL**

Job No	Drawing No	Issue
264039	AR-GN-DRG-3020	A

Do not scale   Drafted By: Drafting Checked:

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

29/06/2020 5:10:07 PM



NOT FOR CONSTRUCTION

Scales

SCALE 0m 1 2 5 10

Filename (Full Drawing No)
WSERRC- ARU-SYD-AR-GN-DRG-3021
Design Model Version

Issue	Date	By	Chkd	Appd
A	29.06.2020	SP	BP/LS	JO

Client: CLEANAWAY Making a sustainable future possible / MACQUARIE

Nominated Architect:
Name: Belinda Lee Parker Date: ....
Registered Architect NSW 9729

Job Title
WSERRC
339 Wallgrove Road, Eastern Creek

Scale at A1: 1 : 100

Discipline: **Architecture Drawings**

ARUP

Arup, Barrack Place, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61(02)9320 9320 Fax +61(02)9320 9321
www.arup.com

CONSULT AUSTRALIA
Member Firm
Arup Pty Ltd
ABN 18 000 966 165

Drawing Title
General Arrangement - Plan
Visitor Centre
Roof Plan

Drawing Status: **ISSUED FOR APPROVAL**

Job No	Drawing No	Issue
264039	AR-GN-DRG-3021	A

Do not scale Drafted By: Drafting Checked:

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

29/06/2020 5:07:56 PM

Appendix C

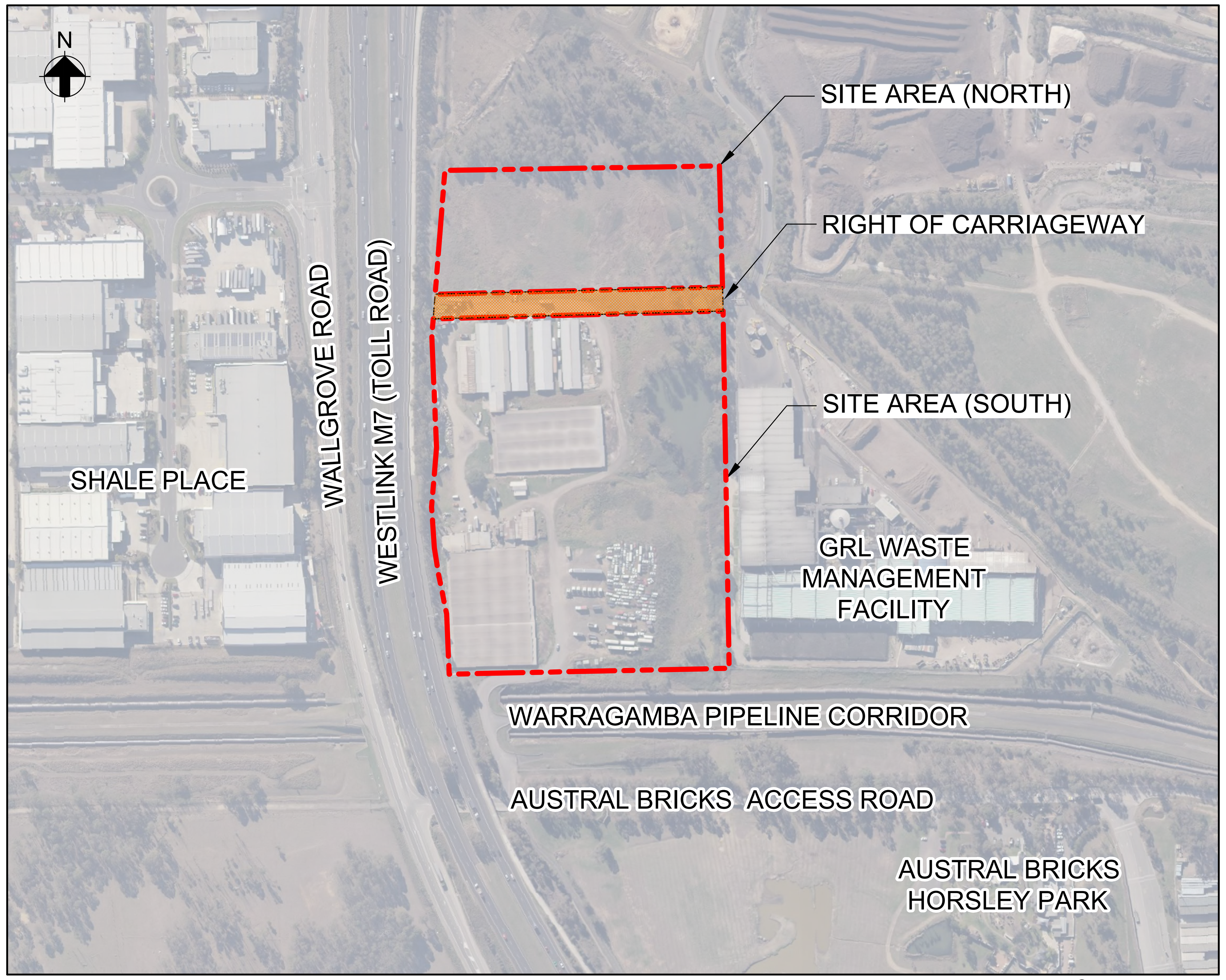
Drawings

INFRASTRUCTURE

CLEANAWAY WESTERN SYDNEY ENERGY & RESOURCE RECOVERY CENTRE

CIVIL ENGINEERING

DRAWING No.	DRAWING LIST
WSERRC-ARU-SYD-CICW-DRG-0001	COVER - SHEET
WSERRC-ARU-SYD-CICW-DRG-0003	LEGEND - SHEET 1 OF 1
WSERRC-ARU-SYD-CICW-DRG-0010	EXISTING SITE - PLAN
WSERRC-ARU-SYD-CICW-DRG-0020	PROPOSED SITE - PLAN
WSERRC-ARU-SYD-CICW-DRG-0080	DEMOLITION AND SITE CLEARANCE - PLAN
WSERRC-ARU-SYD-CICW-DRG-0101	EROSION AND SEDIMENT CONTROL - PLAN - SHEET 1 OF 2
WSERRC-ARU-SYD-CICW-DRG-0102	EROSION AND SEDIMENT CONTROL - PLAN - SHEET 2 OF 2
WSERRC-ARU-SYD-CICW-DRG-0191	EROSION AND SEDIMENT CONTROL - DETAILS
WSERRC-ARU-SYD-CICW-DRG-0201	BULK EARTHWORKS - PLAN - SHEET 1 OF 2
WSERRC-ARU-SYD-CICW-DRG-0202	BULK EARTHWORKS - PLAN - SHEET 2 OF 2
WSERRC-ARU-SYD-CICW-DRG-0301	CIVIL WORKS - PLAN - SHEET 1 OF 2
WSERRC-ARU-SYD-CICW-DRG-0302	CIVIL WORKS - PLAN - SHEET 1 OF 2
WSERRC-ARU-SYD-CICW-DRG-0601	STORMWATER - PLAN - SHEET 1 OF 2
WSERRC-ARU-SYD-CICW-DRG-0602	STORMWATER - PLAN - SHEET 1 OF 2
WSERRC-ARU-SYD-CICW-DRG-0641	STORMWATER LONGITUDINAL SECTIONS SHEET 1 OF 6
WSERRC-ARU-SYD-CICW-DRG-0642	STORMWATER LONGITUDINAL SECTIONS SHEET 2 OF 6
WSERRC-ARU-SYD-CICW-DRG-0643	STORMWATER LONGITUDINAL SECTIONS SHEET 3 OF 6
WSERRC-ARU-SYD-CICW-DRG-0645	STORMWATER LONGITUDINAL SECTIONS SHEET 4 OF 6
WSERRC-ARU-SYD-CICW-DRG-0646	STORMWATER LONGITUDINAL SECTIONS SHEET 5 OF 6
WSERRC-ARU-SYD-CICW-DRG-0691	STORMWATER GRASS CHANNEL TYPICAL SECTION



LOCALITY PLAN
N.T.S

MAP DATA © 2020 GOOGLE

NOT FOR CONSTRUCTION

Issue	Date	By	Chkd	Appd
A	29/06/20	HNA	AC	EM
	FOR APPROVAL			
0	22/05/20	HNA	AC	EM
	FOR PLANNING APPROVAL			

Scales: NOT TO SCALE

Filename (Full Drawing No): WSERRC-ARU-SYD-CICW-DRG-0001
Design Model Version

Client: CLEANAWAY WESTERN SYDNEY ENERGY & RESOURCE RECOVERY CENTRE; MACQUARIE

Engineering Certification (CEng)
Name: ....
Signature: .... Date: ....

Job Title: WESTERN SYDNEY ENERGY AND RESOURCE RECOVERY CENTRE

Scale at A1: NOT TO SCALE

Discipline: Civil

ARUP

Arup, Barrack Place, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61 (02) 9320 9320 Fax +61 (02) 9320 9321
www.arup.com

CONSULT AUSTRALIA Member Firm
Arup Pty Ltd
ABN 18 000 966 165

Drawing Title: COVER SHEET, DRAWING LIST AND LOCALITY PLAN

Drawing Status: Issue for Approval

Job No: 264039-00 | Drawing No: ARU-SYD-CICW-DRG-0001 | Issue: A

Do not scale

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

EXISTING FEATURES

BOUNDARY
DRIVEWAY, PATHWAY OR CYCLE WAY
TOP OF BATTER
BOTTOM OF BATTER
KERB AND GUTTER
KERB ONLY
KERB INLET PIT
DISHED CROSSING
FENCE
EDGE OF GARDEN
SPOT LEVEL
BOLLARDS
EXISTING CONTOURS
EXISTING TREE

EXISTING UTILITIES

STORMWATER
WARRAGAMBA PIPELINE - QL B
WATER - QL B
WATER - QL D
WATER - IRRIGATION SERVICE - QL D
SEWER
ELECTRICAL - OVERHEAD
ELECTRICAL - UNDERGROUND - QL B
ELECTRICAL
COMMUNICATIONS - UNDERGROUND - QL B
COMMUNICATIONS - UNDERGROUND - QL D
COMMUNICATIONS - UNDERGROUND
COMMUNICATIONS - PIT
COMMUNICATION - JUNCTION PIT
COMMUNICATION - JUNCTION PIT
ELECTRICAL - SUBSTATION
SEWER - SEPTIC TANK

EXISTING UTILITIES - CONT

EXISTING - DBYD

TESLTRA
WATER
SEWER
ELECTRICAL

PROPOSED SEDIMENT AND EROSION CONTROL MEASURES

TEMPORARY CONSTRUCTION EXIT
SILT FENCE
DIVERSION BANK AND CHANNEL
STOCKPILE
SEDIMENT BASIN

PROPOSED BULK EARTHWORKS

× BEL: 23.021m — BULK EARTHWORKS LEVEL

PROPOSED CIVIL WORKS

EXTENT OF WORKS BOUNDARY
EDGE OF BITUMEN
MINOR CONTOUR
MAJOR CONTOUR
RL: 27.729m — FINISHED SURFACE LEVELS
0.3% — GRADIENT
0MC01 10 — CONTROL LINE, CHAINAGE AND CONTROL LINE LABEL
RETAINING WALL
RW01 — RETAINING WALL LABEL
BUILDING

PROPOSED DRAINAGE

STORMWATER PIPE
Ø375 — PIPE SIZE
STANDARD GRATED KERB INLET PIT
STANDARD GREATED PIT
GROSS POLLUTANT TRAP
SUB-SOIL SLOTTED STORMWATER PIPE
01-01 — PIT LABEL LINE NUMBER 01 / PIT NUMBER 01
BIORETENTION FILTER AREA
HEADWALL
CATCHMENT BOUNDARY
0.211 Ha — CATCHMENT AREA

PROPOSED LINEMARKING

PARKING

NOT FOR CONSTRUCTION

Scales
NOT TO SCALE

Filename (Full Drawing No)
WSERRC-ARU-SYD-CICW-DRG-0003
Design Model Version
123456-CAL-MOD-XXXX

Issue	Date	By	Chkd	Appd
A	29/06/20	HNA	AC	EM
	FOR APPROVAL			
0	22/05/20	HNA	AC	EM
	FOR PLANNING APPROVAL			

Client
CLEANAWAY WESTERN SYDNEY ENERGY & RESOURCE RECOVERY CENTRE
MACQUARIE

Engineering Certification (CEng)
Name: ....
Signature: .... Date: ....

Job Title
WESTERN SYDNEY ENERGY AND RESOURCE RECOVERY CENTRE

Scale at A1 NOT TO SCALE
Discipline Civil

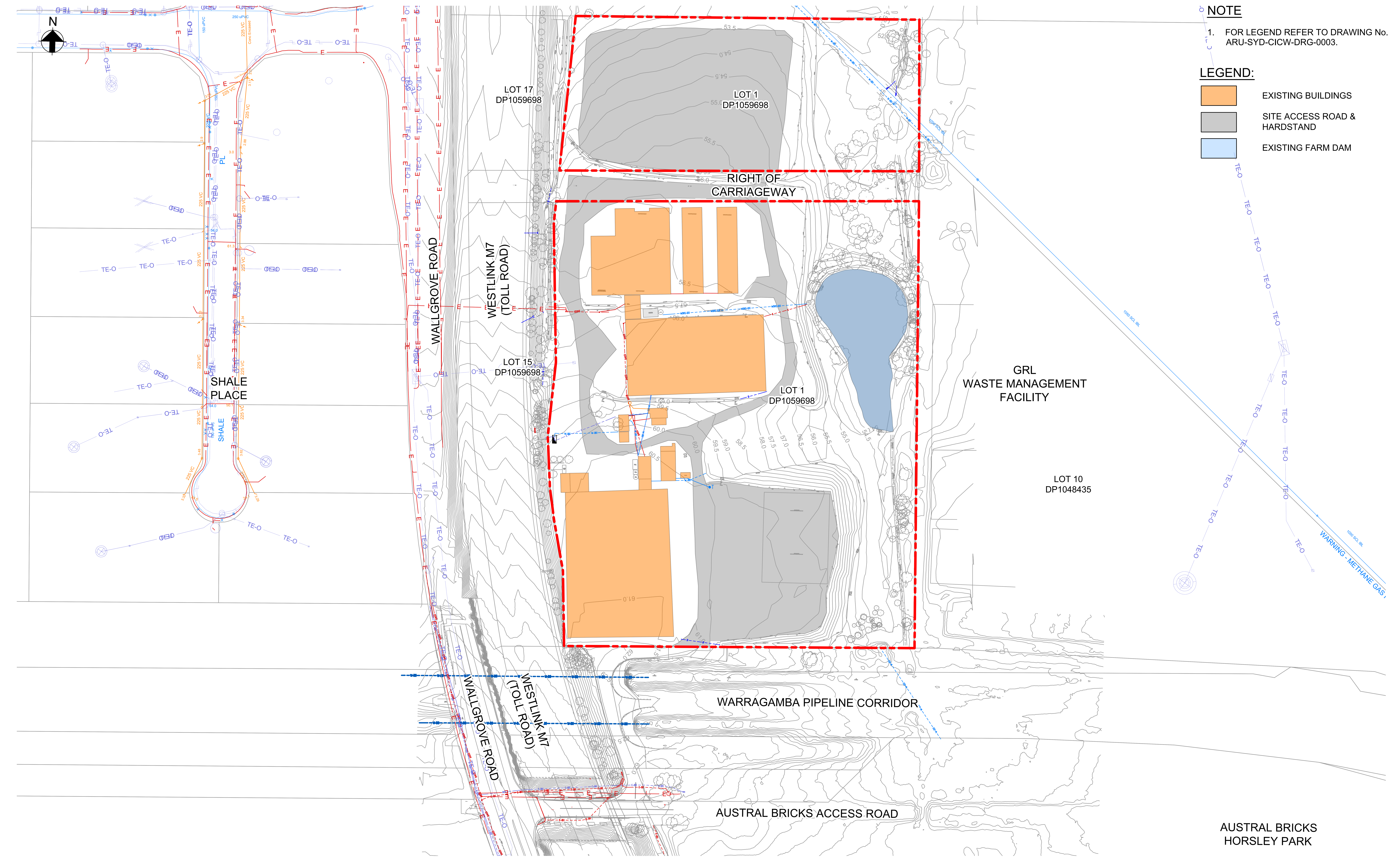
ARUP
Arup, Level 10, 201 Kent St
Sydney, NSW, 2000
Tel +61 (02) 9320 9320 Fax +61 (02) 9320 9321
www.arup.com

CONSULT AUSTRALIA
Member Firm
Arup Pty Ltd
ABN 18 000 966 165

Drawing Title
LEGEND
SHEET 1 OF 1

Drawing Status
Issue for Approval

Job No 264039-00
Drawing No ARU-SYD-CICW-DRG-0003
Issue A



NOT FOR CONSTRUCTION

Scales: NOT TO SCALE

Filename (Full Drawing No): WSERRC-ARU-SYD-CICW-DRG-0010
Design Model Version

Issue	Date	By	Chkd	Appd
A	29/06/20	HNA	AC	EM
	FOR APPROVAL			
0	22/05/20	HNA	AC	EM
	FOR PLANNING APPROVAL			

Client: CLEANAWAY WESTERN SYDNEY ENERGY & RESOURCE RECOVERY CENTRE; MACQUARIE

Engineering Certification (CEng)
Name:
Signature: Date:

Job Title: WESTERN SYDNEY ENERGY AND RESOURCE RECOVERY CENTRE

Scale at A1: NOT TO SCALE

Discipline: Civil

ARUP

Arup, Barrack Place, Level 5, 151 Clarence St Sydney, NSW, 2000
Tel +61 (02) 9320 9320 Fax +61 (02) 9320 9321
www.arup.com

CONSULT AUSTRALIA Member Firm
Arup Pty Ltd ABN 18 000 966 165

Drawing Title: EXISTING SITE PLAN

Drawing Status: Issue for Approval

Job No: 264039-00
Drawing No: ARU-SYD-CICW-DRG-0010
Issue: A

Do not scale

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

A	SITE ENTRANCE (RE-USING EXISTING CROSSING)
B	WASTE INSPECTION LAY-BY
C	WASTE CRANE PARKING
D	IBA HALL AND DRIVE THROUGH AT LOWER LEVEL. ADMINISTRATION BUILDING AT HIGHER LEVELS
E	RAINWATER TANKS
F	DRIVE-THROUGH FOR CONSUMABLES UNLOADING
G	DIESEL TANKS
H	AMMONIA TANK
I	SODIUM HYDROXIDE TANK
J	FIRE WATER TANKS AND PUMP SET
K	MAIN STAFF CAR PARK
L	OVERSPILL CAR PARK AND COACH PARKING
M	BIO-RETENTION BASIN
N	ON-SITE DETENTION BASIN
O	OVERLAND FLOW CHANNEL
P	POTABLE WATER TANK
Q	SEWER PUMP STATION

Scales

Filename (Full Drawing No)
WSERRC-ARU-SYD-CICW-DRG-0020
Design Model Version

Issue	Date	By	Chkd	Appd
A	29/06/20	HNA	AC	EM
	FOR APPROVAL			
0	22/05/20	HNA	AC	EM
	FOR PLANNING APPROVAL			

Client
CLEANAWAY WESTERN SYDNEY ENERGY & RESOURCE RECOVERY CENTRE
MACQUARIE

Engineering Certification (CEng)
Name:
Signature: Date:

Job Title
WESTERN SYDNEY ENERGY AND RESOURCE RECOVERY CENTRE

Scale at A1 1:500m
Discipline Civil

ARUP
Arup, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61 (02) 9320 9320 Fax +61 (02) 9320 9321
www.arup.com

CONSULT AUSTRALIA
Member Firm
Arup Pty Ltd
ABN 18 000 966 165

Drawing Title
PROPOSED SITE PLAN

Drawing Status
Issue for Approval

Job No	Drawing No	Issue
264039-00	ARU-SYD-CICW-DRG-0020	A

Do not scale

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

NOTE

1. FOR LEGEND REFER TO DRAWING No. ARU-SYD-CICW-DRG-0003.

LEGEND:

- EXISTING BUILDINGS (INCLUDING FOUNDATIONS) TO BE REMOVED
- EXISTING VEHICLE PARKING HARDSTAND TO BE REMOVED
- EXISTING LANDSCAPE / GRAVEL TO BE REMOVED
- EXISTING FARM DAM TO BE REMOVED

DISTURBED AREAS	
TYPE	AREA (m^2)
BUILDING	14,520
LANDSCAPE	31,000
HARDSTAND	12,000
FARM DAM (WATER LEVEL RL 53.64)	3,390

NOT FOR CONSTRUCTION

Scales

NOT TO SCALE

Filename (Full Drawing No)
WSERRC-ARU-SYD-CICW-DRG-0080
Design Model Version

Issue	Date	By	Chkd	Appd
A	29/06/20	HNA	AC	EM
	FOR APPROVAL			
0	22/05/20	HNA	AC	EM
	FOR PLANNING APPROVAL			

Client
CLEANAWAY WESTERN SYDNEY ENERGY & RESOURCE RECOVERY CENTRE
MACQUARIE

Engineering Certification (CEng)
Name: ....
Signature: .... Date: ....

Job Title
WESTERN SYDNEY ENERGY AND RESOURCE RECOVERY CENTRE

Scale at A1 NOT TO SCALE
Discipline Civil

ARUP

Arup, Barrack Place, Level 5, 151 Clarence St Sydney, NSW, 2000
Tel +61 (02) 9320 9320 Fax +61 (02) 9320 9321
www.arup.com

CONSULT AUSTRALIA Member Firm
Arup Pty Ltd ABN 18 000 966 165

Drawing Title
DEMOLITION AND SITE CLEARANCE PLAN

Drawing Status
Issue for Approval

Job No 264039-00
Drawing No ARU-SYD-CICW-DRG-0080
Issue A

Do not scale

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

NOT FOR CONSTRUCTION

Scales

NOT TO SCALE

Filename (Full Drawing No)
WSERRC-ARU-SYD-CICW-DRG-0101
Design Model Version

Issue	Date	By	Chkd	Appd
A	29/06/20	HNA	AC	EM
	FOR APPROVAL			
0	22/05/20	HNA	AC	EM
	FOR PLANNING APPROVAL			

Client: CLEANAWAY WESTERN SYDNEY ENERGY & RESOURCE RECOVERY CENTRE; MACQUARIE

Engineering Certification (CEng)
Name: ....
Signature: .... Date: ....

Job Title
WESTERN SYDNEY ENERGY AND RESOURCE RECOVERY CENTRE

Scale at A1 1:500m
Discipline Civil

ARUP

Arup, Barrack Place, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61 (02) 9320 9320 Fax +61 (02) 9320 9321
www.arup.com

CONSULT AUSTRALIA
Member Firm
Arup Pty Ltd
ABN 18 000 966 165

Drawing Title
EROSION AND SEDIMENT CONTROL PLAN
SHEET 1 OF 2

Drawing Status
Issue for Approval

Job No	Drawing No	Issue
264039-00	ARU-SYD-CICW-DRG-0101	A

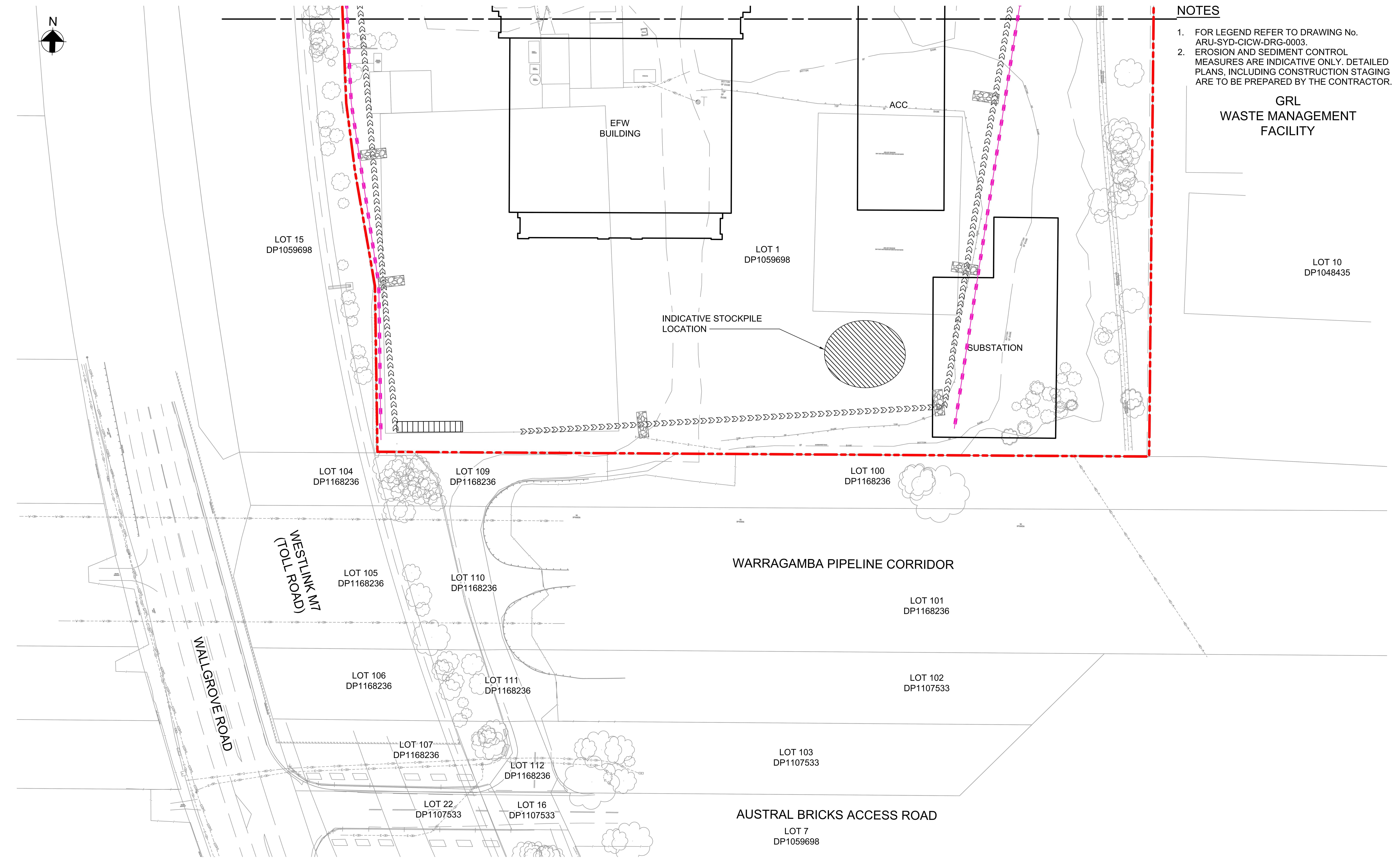
Do not scale

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

ADJOINS DRG No. ARU-SYD-CICW-DRG-0101

NOTES

1. FOR LEGEND REFER TO DRAWING No. ARU-SYD-CICW-DRG-0003.
2. EROSION AND SEDIMENT CONTROL MEASURES ARE INDICATIVE ONLY. DETAILED PLANS, INCLUDING CONSTRUCTION STAGING ARE TO BE PREPARED BY THE CONTRACTOR.



NOT FOR CONSTRUCTION

Scales
0 10 20m
A1 / A3
1:500 / 1:1000

Filename (Full Drawing No)
WSERRC-ARU-SYD-CICW-DRG-0102
Design Model Version

Issue	Date	By	Chkd	Appd
A	29/06/20	HNA	AC	EM
	FOR APPROVAL			
0	22/05/20	HNA	AC	EM
	FOR PLANNING APPROVAL			

Client
CLEANAWAY WESTERN SYDNEY ENERGY & RESOURCE RECOVERY CENTRE
MACQUARIE

Engineering Certification (CEng)
Name: ......
Signature: ...... Date: ......

Job Title
WESTERN SYDNEY ENERGY AND RESOURCE RECOVERY CENTRE

Scale at A1 1:500m
Discipline Civil

ARUP
Arup, Barrack Place, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61 (02) 9320 9320 Fax +61 (02) 9320 9321
www.arup.com

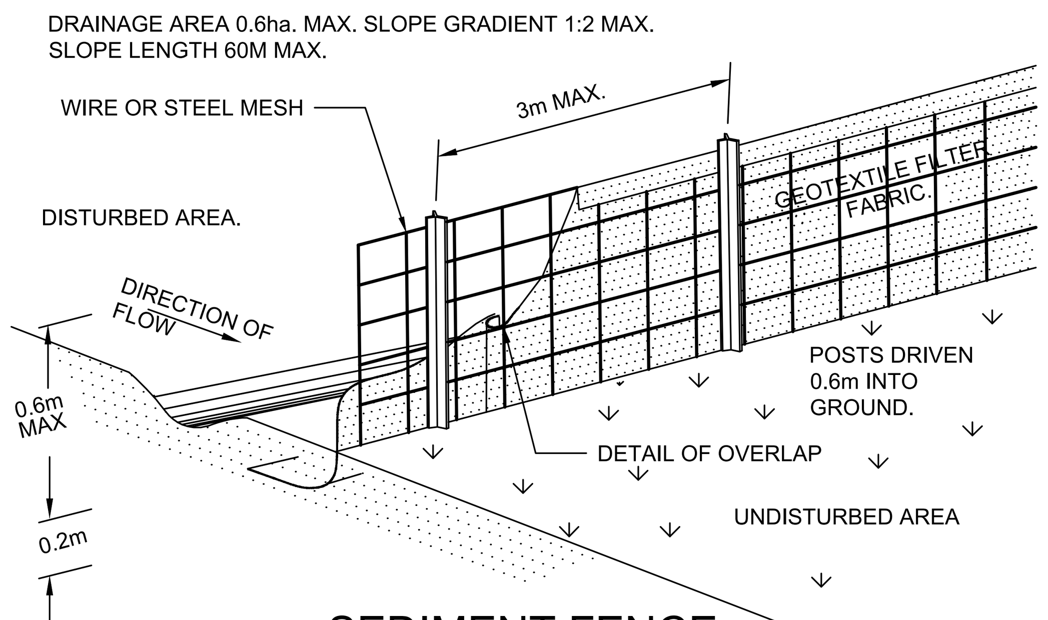
CONSULT AUSTRALIA
Member Firm
Arup Pty Ltd
ABN 18 000 966 165

Drawing Title
EROSION AND SEDIMENT CONTROL PLAN
SHEET 2 OF 2

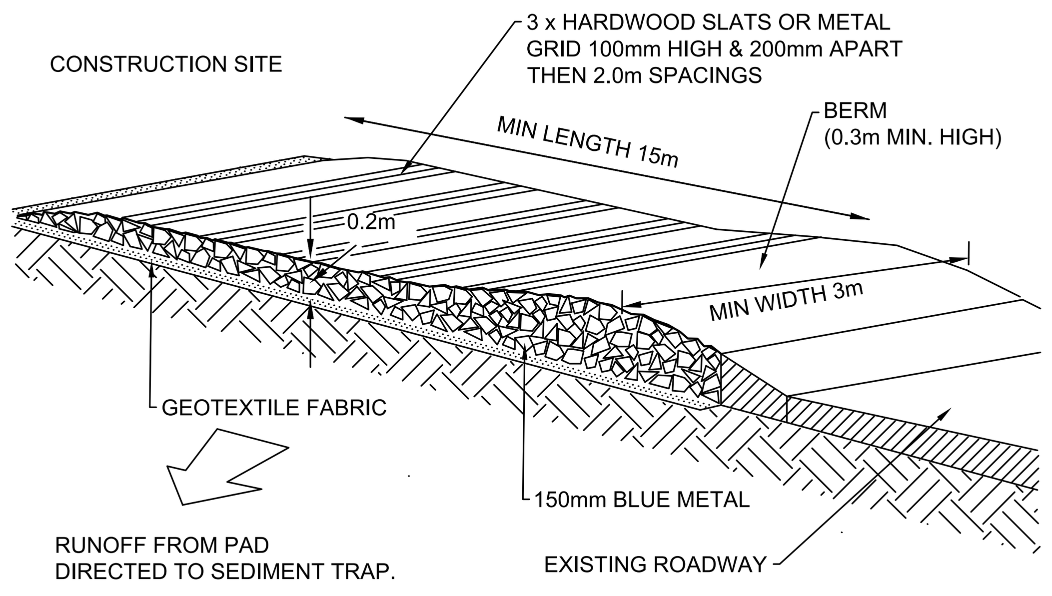
Drawing Status
Issue for Approval

Job No	Drawing No	Issue
264039-00	ARU-SYD-CICW-DRG-0102	A

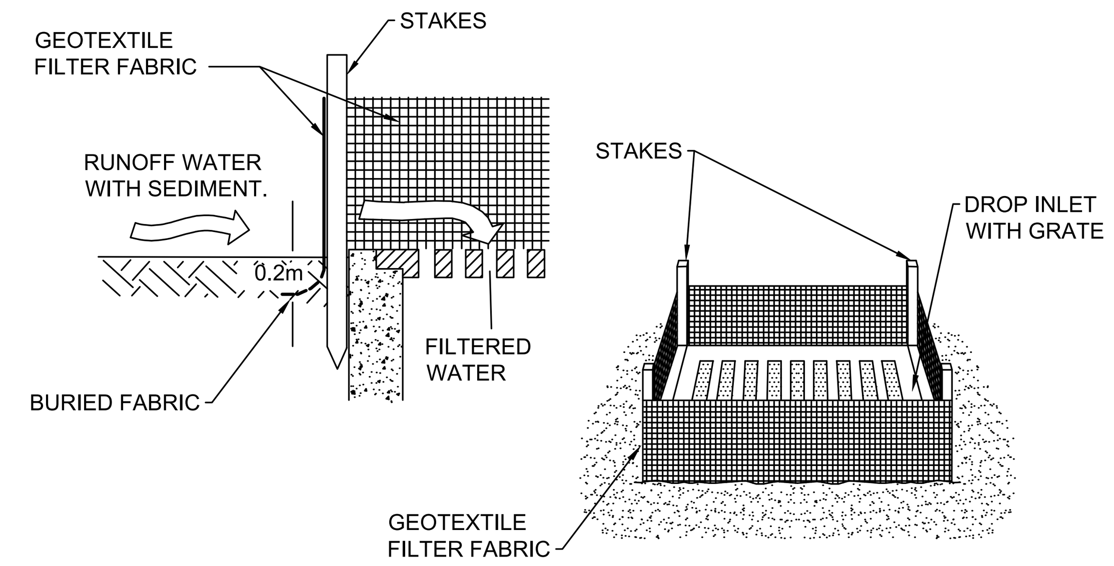
Do not scale
DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR
© Arup



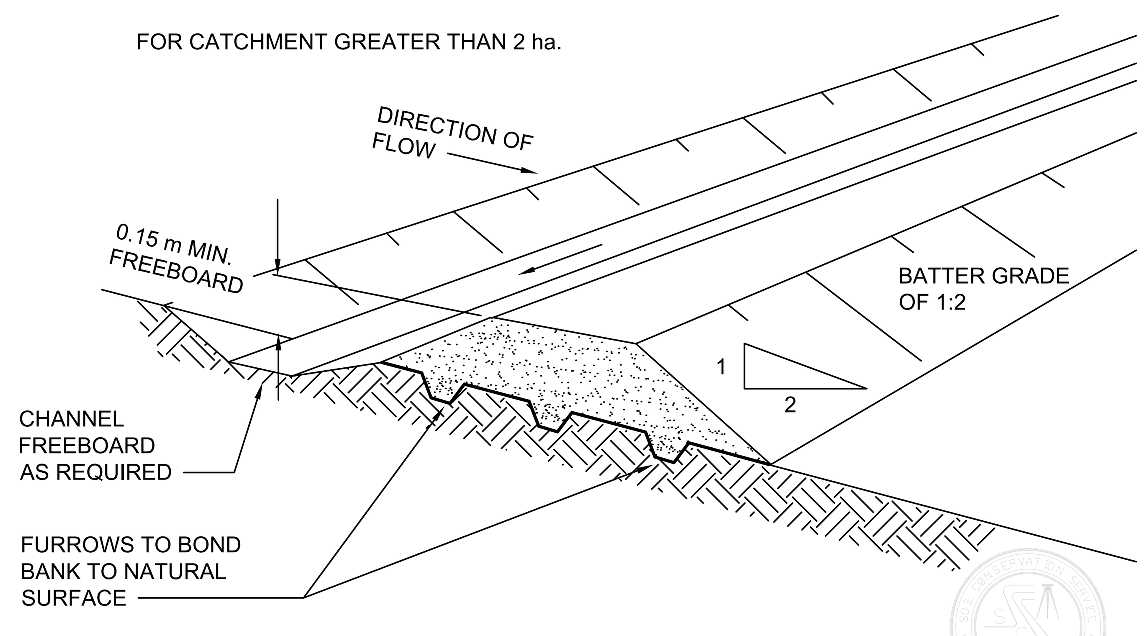
SEDIMENT FENCE



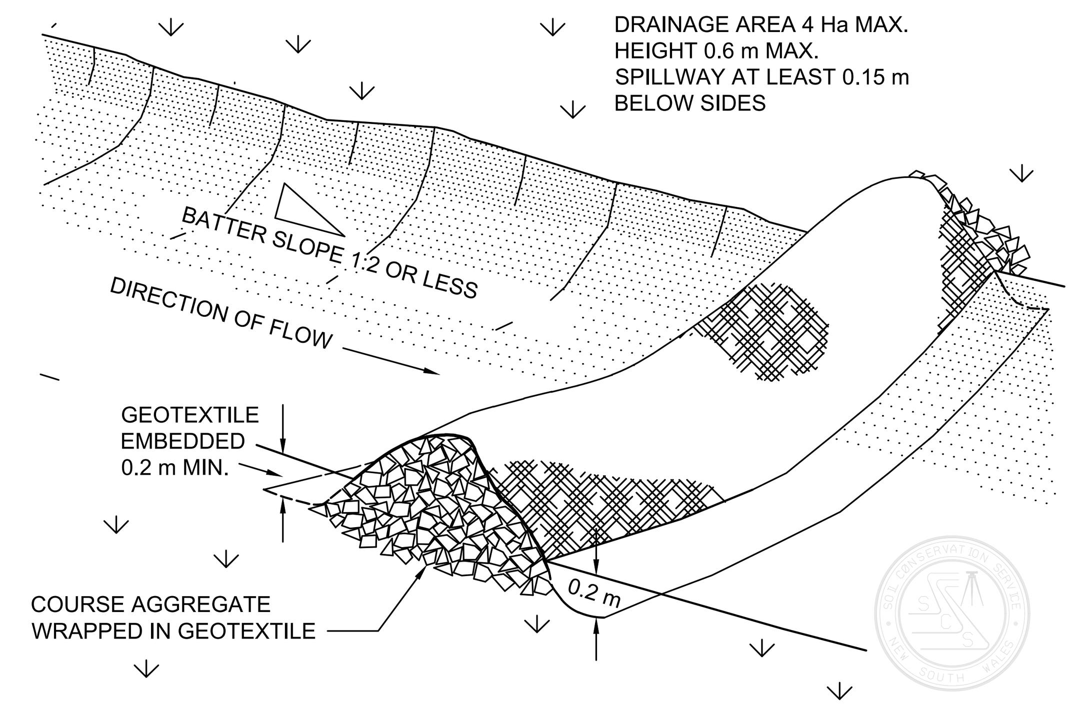
TEMPORARY CONSTRUCTION EXIT



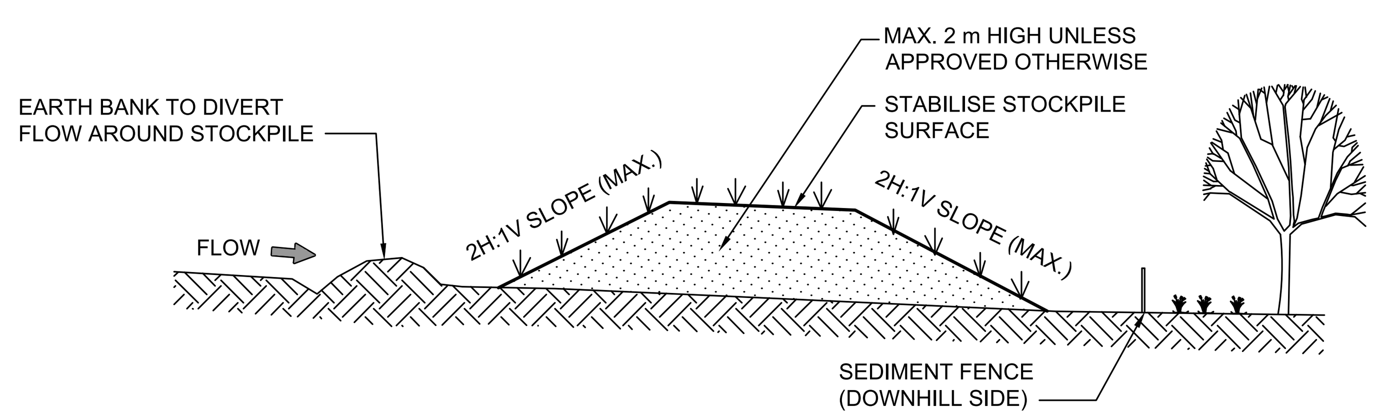
GEOTEXTILE FILTER FABRIC DROP INLET SEDIMENT TRAP



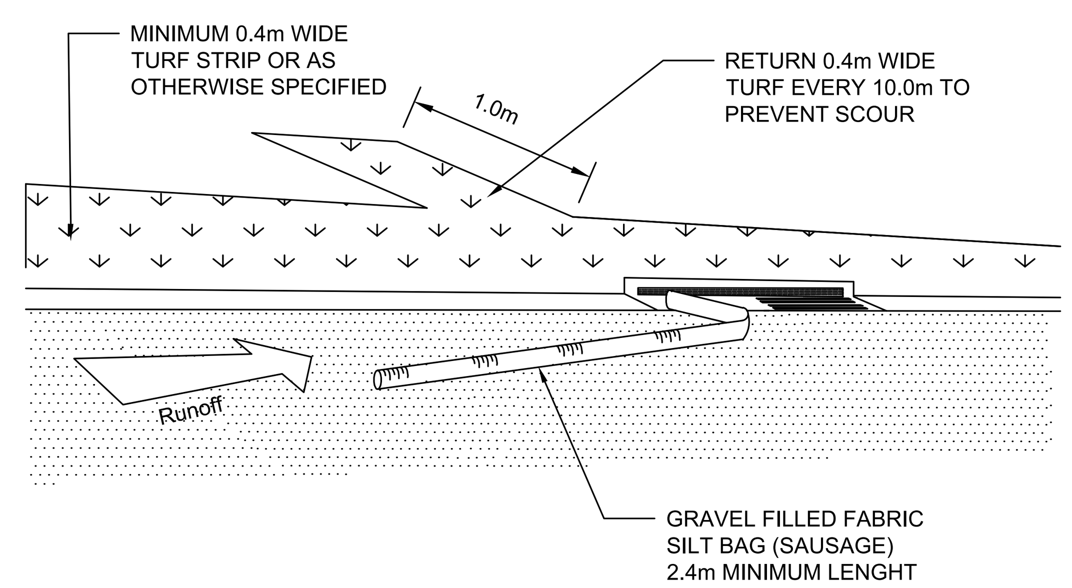
DIVERSION BANK AND CHANNEL



ROCK CHECK DAM



STOCKPILE



FABRIC STOCKING KERB INLET SEDIMENT TRAP

NOT FOR CONSTRUCTION

Scales

Filename (Full Drawing No)
WSERRC-ARU-SYD-CICW-DRG-0191
Design Model Version

Issue	Date	By	Chkd	Appd
A	29/06/20	HNA	AC	EM
FOR APPROVAL				
0	22/05/20	HNA	AC	EM
FOR PLANNING APPROVAL				

Client: CLEANAWAY WESTERN SYDNEY ENERGY & RESOURCE RECOVERY CENTRE / MACQUARIE

Engineering Certification (CEng)
Name: ....
Signature: .... Date: ....

Job Title
WESTERN SYDNEY ENERGY AND RESOURCE RECOVERY CENTRE

Scale at A1

Discipline: Civil

ARUP
Arup, Barrack Place, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61 (02) 9320 9320 Fax +61 (02) 9320 9321
www.arup.com

CONSULT AUSTRALIA Member Firm
Arup Pty Ltd ABN 18 000 966 165

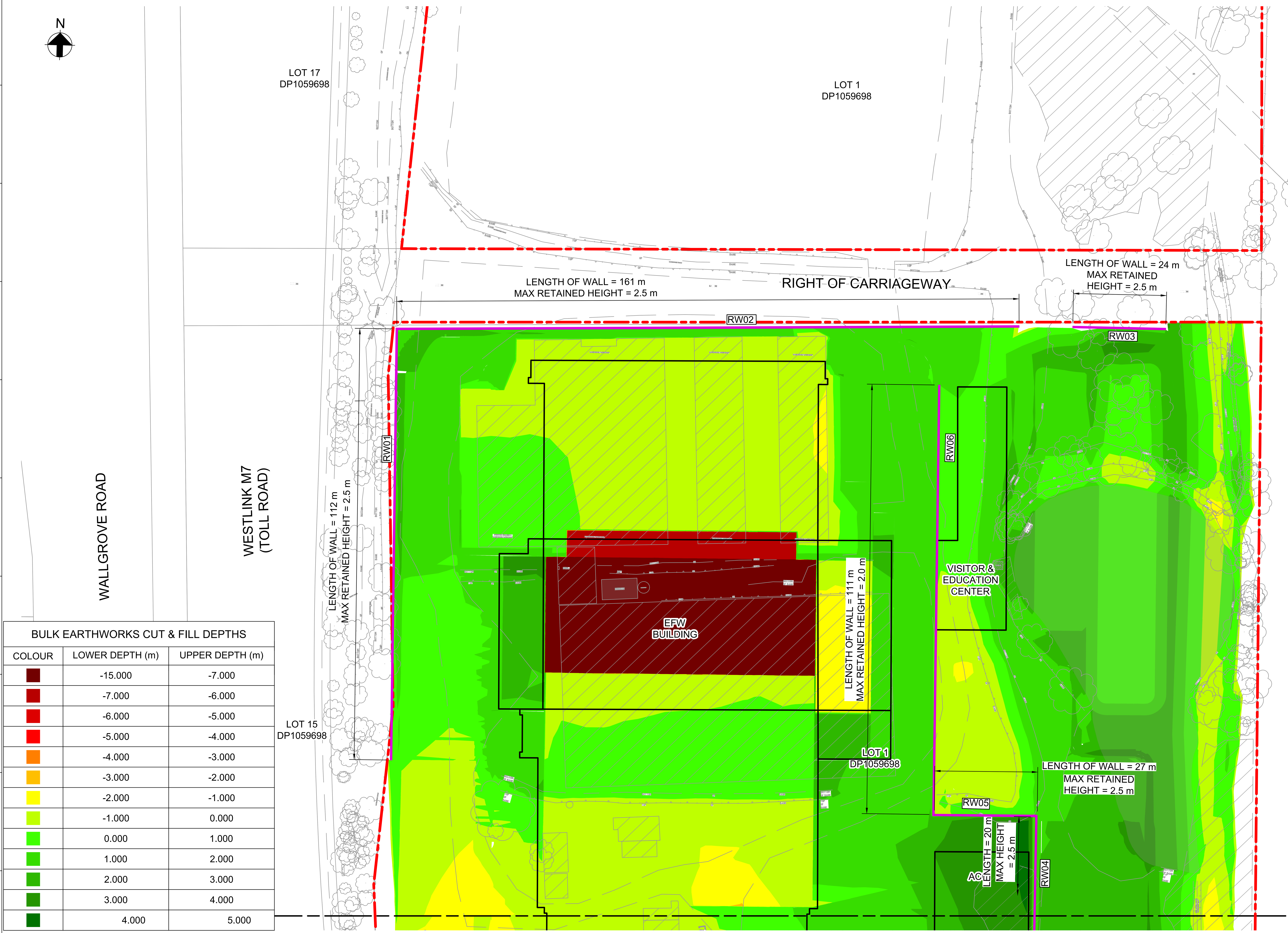
Drawing Title
EROSION AND SEDIMENT CONTROL DETAILS

Drawing Status
Issue for Approval

Job No	Drawing No	Issue
264039-00	ARU-SYD-CICW-DRG-0191	A

Do not scale

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR



NOTE

1. FOR LEGEND REFER TO DRAWING No. ARU-SYD-CICW-DRG-0003.
2. COLOURS REPRESENT DEPTHS OF CUT AND FILL FROM EXISTING LEVELS TO BULK EARTHWORKS LEVELS (STAGE 1 CUT AND FILL).
3. FILL FROM BULK EARTHWORKS LEVELS TO FORMATION LEVELS (STAGE 2 FILL) IS NOT SHOWN ON THESE PLANS.
4. CUT AND FILL DEPTHS INDICATE BULK EXCAVATION ONLY.

BULK EARTHWORKS CUT & FILL DEPTHS

COLOUR	LOWER DEPTH (m)	UPPER DEPTH (m)
	-15.000	-7.000
	-7.000	-6.000
	-6.000	-5.000
	-5.000	-4.000
	-4.000	-3.000
	-3.000	-2.000
	-2.000	-1.000
	-1.000	0.000
	0.000	1.000
	1.000	2.000
	2.000	3.000
	3.000	4.000
	4.000	5.000

ADJOINS DRG No. ARU-SYD-CICW-DRG-0202

NOT FOR CONSTRUCTION

Scales
0 10 20m
A1 / A3
1:500 / 1:1000

Filename (Full Drawing No)
WSERRC-ARU-SYD-CICW-DRG-0201
Design Model Version

Issue	Date	By	Chkd	Appd
A	29/06/20	HNA	AC	EM
	FOR APPROVAL			
0	22/05/20	HNA	AC	EM
	FOR PLANNING APPROVAL			

Client
CLEANAWAY WESTERN SYDNEY ENERGY & RESOURCE RECOVERY CENTRE
MACQUARIE

Engineering Certification (CEng)
Name: ....
Signature: .... Date: ....

Job Title
WESTERN SYDNEY ENERGY AND RESOURCE RECOVERY CENTRE

Scale at A1 1:500m
Discipline Civil

ARUP
Arup, Barrack Place, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61 (02) 9320 9320 Fax +61 (02) 9320 9321
www.arup.com

CONSULT AUSTRALIA
Member Firm
Arup Pty Ltd
ABN 18 000 966 165

Drawing Title
BULK EARTHWORKS PLAN
SHEET 1 OF 2

Drawing Status
Issue for Approval

Job No	Drawing No	Issue
264039-00	ARU-SYD-CICW-DRG-0201	A

Do not scale

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

ADJOINS DRG No. ARU-SYD-CICW-DRG-0201

NOTE

1. FOR LEGEND REFER TO DRAWING No. ARU-SYD-CICW-DRG-0003.
2. COLOURS REPRESENT DEPTHS OF CUT AND FILL FROM EXISTING LEVELS TO BULK EARTHWORKS LEVELS (STAGE 1 CUT AND FILL).
3. FILL FROM BULK EARTHWORKS LEVELS TO FORMATION LEVELS (STAGE 2 FILL) IS NOT SHOWN ON THESE PLANS.
4. CUT AND FILL DEPTHS INDICATE BULK EXCAVATION ONLY.

BULK EARTHWORKS CUT & FILL DEPTHS

COLOUR	LOWER DEPTH (m)	UPPER DEPTH (m)
	-15.000	-7.000
	-7.000	-6.000
	-6.000	-5.000
	-5.000	-4.000
	-4.000	-3.000
	-3.000	-2.000
	-2.000	-1.000
	-1.000	0.000
	0.000	1.000
	1.000	2.000
	2.000	3.000
	3.000	4.000
	4.000	5.000

NOT FOR CONSTRUCTION

Scales
0 10 20m
A1 / A3
1:500 / 1:1000

Filename (Full Drawing No)
WSERRC-ARU-SYD-CICW-DRG-0202
Design Model Version

Issue	Date	By	Chkd	Appd
A	29/06/20	HNA	AC	EM
	FOR APPROVAL			
0	22/05/20	HNA	AC	EM
	FOR PLANNING APPROVAL			

Client
CLEANAWAY WESTERN SYDNEY ENERGY & RESOURCE RECOVERY CENTRE
MACQUARIE

Engineering Certification (CEng)
Name: ....
Signature: .... Date: ....

Job Title
WESTERN SYDNEY ENERGY AND RESOURCE RECOVERY CENTRE

Scale at A1 1:500m
Discipline Civil

ARUP
Arup, Barrack Place, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61 (02) 9320 9320 Fax +61 (02) 9320 9321
www.arup.com

CONSULT AUSTRALIA Member Firm
Arup Pty Ltd
ABN 18 000 966 165

Drawing Title
BULK EARTHWORKS PLAN
SHEET 2 OF 2

Drawing Status
Issue for Approval

Job No 264039-00
Drawing No ARU-SYD-CICW-DRG-0202
Issue A

Do not scale
© Arup

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

NOTE

1. FOR LEGEND REFER TO DRAWING No. ARU-SYD-CICW-DRG-0002.

ADJOINS DRG No. ARU-SYD-CICW-DRG-0302

NOT FOR CONSTRUCTION

Scales: 0 10 20m — A1 / A3 1:500 / 1:1000

Filename (Full Drawing No): WSERRC-ARU-SYD-CICW-DRG-0301
Design Model Version

Issue	Date	By	Chkd	Appd
A	29/06/20	HNA	AC	EM
	FOR APPROVAL			
0	22/05/20	HNA	AC	EM
	FOR PLANNING APPROVAL			

Client: CLEANAWAY WESTERN SYDNEY ENERGY & RESOURCE RECOVERY CENTRE; MACQUARIE

Engineering Certification (CEng)
Name:
Signature: Date:

Job Title: WESTERN SYDNEY ENERGY AND RESOURCE RECOVERY CENTRE

Scale at A1: 1:500m
Discipline: Civil

ARUP
Arup, Barrack Place, Level 5, 151 Clarence St Sydney, NSW, 2000
Tel +61 (02) 9320 9320 Fax +61 (02) 9320 9321
www.arup.com

CONSULT AUSTRALIA Member Firm
Arup Pty Ltd ABN 18 000 966 165

Drawing Title: CIVIL WORKS PLAN SHEET 1 OF 2
Drawing Status: Issue for Approval
Job No: 264039-00
Drawing No: ARU-SYD-CICW-DRG-0301
Issue: A

Do not scale

© Arup

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

A1

ADJOINS DRG No. ARU-SYD-CICW-DRG-0301

NOTE

1. FOR LEGEND REFER TO DRAWING No. ARU-SYD-CICW-DRG-0002.

NOT FOR CONSTRUCTION

Scales
0 10 20m
A1 / A3
1:500 / 1:1000

Filename (Full Drawing No)
WSERRC-ARU-SYD-CICW-DRG-0302
Design Model Version

Issue	Date	By	Chkd	Appd
A	29/06/20	HNA	AC	EM
	FOR APPROVAL			
0	22/05/20	HNA	AC	EM
	FOR PLANNING APPROVAL			

Client
CLEANAWAY WESTERN SYDNEY ENERGY & RESOURCE RECOVERY CENTRE
MACQUARIE

Engineering Certification (CEng)
Name: ....
Signature: .... Date: ....

Job Title
WESTERN SYDNEY ENERGY AND RESOURCE RECOVERY CENTRE

Scale at A1 1:500m
Discipline Civil

ARUP
Arup, Barrack Place, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61 (02) 9320 9320 Fax +61 (02) 9320 9321
www.arup.com

CONSULT AUSTRALIA
Member Firm
Arup Pty Ltd
ABN 18 000 966 165

Drawing Title
CIVIL WORKS
PLAN
SHEET 2 OF 2

Drawing Status
Issue for Approval

Job No	Drawing No	Issue
264039-00	ARU-SYD-CICW-DRG-0302	A

Do not scale

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

NOTE

1. FOR LEGEND REFER TO DRAWING No. ARU-SYD-CICW-DRG-0003.
2. PIT AND HEADWALL SIZES ARE SHOWN INDICATIVELY FOR PRESENTATION PURPOSES.
3. REFER TO DRAWINGS No's ARU-SYD-CICW-DRG-0251 TO 0257 FOR LONG SECTIONS.
4. AREAS WITH HYDROCARBON AND CHEMICAL STORAGES, INCLUDING ELECTRICAL SUBSTATION, DIESEL AND AMMONIUM TANKS ARE TO BE BUNDED WITH STORMWATER RUNOFF DISCHARGED VIA OIL AND WATER SEPARATORS WITH IN-BUILT SHUT-OFF VALVES.

NOT FOR CONSTRUCTION

Scales
0 10 20m
A1 / A3
1:500 / 1:1000

Filename (Full Drawing No)
WSERRC-ARU-SYD-CICW-DRG-0601
Design Model Version

Issue	Date	By	Chkd	Appd
A	29/06/20	HNA	AC	EM
	FOR APPROVAL			
0	22/05/20	HNA	AC	EM
	FOR PLANNING APPROVAL			

Client
CLEANAWAY WESTERN SYDNEY ENERGY & RESOURCE RECOVERY CENTRE
MACQUARIE

Engineering Certification (CEng)
Name:
Signature: Date:

Job Title
WESTERN SYDNEY ENERGY AND RESOURCE RECOVERY CENTRE

Scale at A1 1:500m
Discipline Civil

ARUP
Arup, Barrack Place, Level 5, 151 Clarence St Sydney, NSW, 2000
Tel +61 (02) 9320 9320 Fax +61 (02) 9320 9321
www.arup.com

CONSULT AUSTRALIA Member Firm
Arup Pty Ltd ABN 18 000 966 165

Drawing Title
STORMWATER PLAN
SHEET 1 OF 2

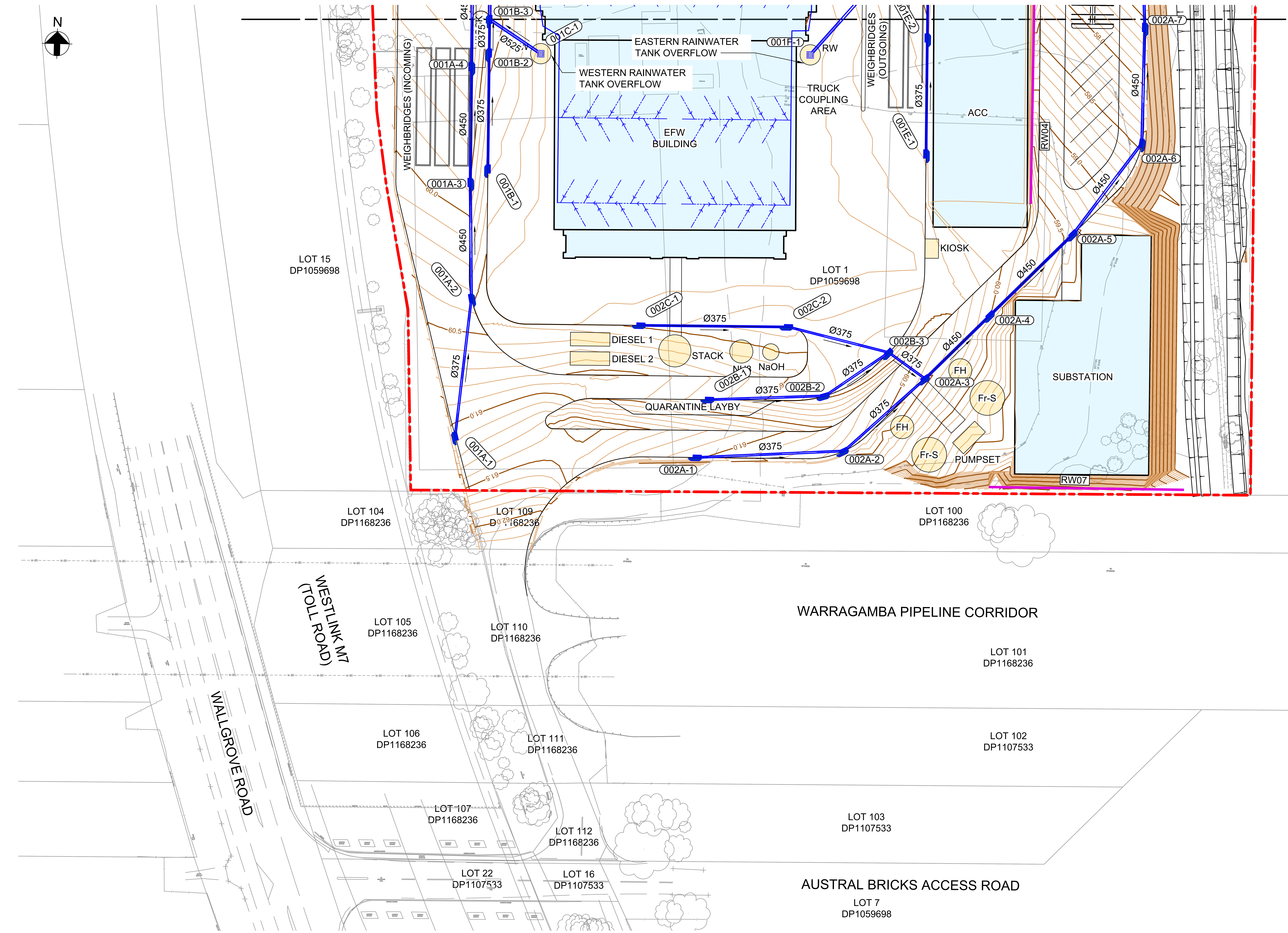
Drawing Status
Issue for Approval

Job No	Drawing No	Issue
264039-00	ARU-SYD-CICW-DRG-0601	A

Do not scale

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

ADJOINS DRG No. ARU-SYD-CICW-DRG-0601



NOTE

1. FOR LEGEND REFER TO DRAWING No. ARU-SYD-CICW-DRG-0003.
2. PIT AND HEADWALL SIZES ARE SHOWN INDICATIVELY FOR PRESENTATION PURPOSES.
3. REFER TO DRAWINGS No's ARU-SYD-CICW-DRG-0251 TO 0257 FOR LONG SECTIONS.
4. AREAS WITH HYDROCARBON AND CHEMICAL STORAGES, INCLUDING ELECTRICAL SUBSTATION, DIESEL AND AMMONIUM TANKS ARE TO BE BUNDED WITH STORMWATER RUNOFF DISCHARGED VIA OIL AND WATER SEPARATORS WITH IN-BUILT SHUT-OFF VALVES.

NOT FOR CONSTRUCTION

Scales
0 10 20m
A1 / A3
1:500 / 1:1000

Filename (Full Drawing No)
WSERRC-ARU-SYD-CICW-DRG-0602
Design Model Version

Issue	Date	By	Chkd	Appd
A	29/06/20	HNA	AC	EM
	FOR APPROVAL			
0	22/05/20	HNA	AC	EM
	FOR PLANNING APPROVAL			

Client
CLEANAWAY WESTERN SYDNEY ENERGY & RESOURCE RECOVERY CENTRE
MACQUARIE

Engineering Certification (CEng)
Name:
Signature: Date:

Job Title
WESTERN SYDNEY ENERGY AND RESOURCE RECOVERY CENTRE

Scale at A1 1:500m
Discipline Civil

ARUP
Arup, Barrack Place, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61 (02) 9320 9320 Fax +61 (02) 9320 9321
www.arup.com

CONSULT AUSTRALIA
Member Firm
Arup Pty Ltd
ABN 18 000 966 165

Drawing Title
STORMWATER
PLAN
SHEET 2 OF 2

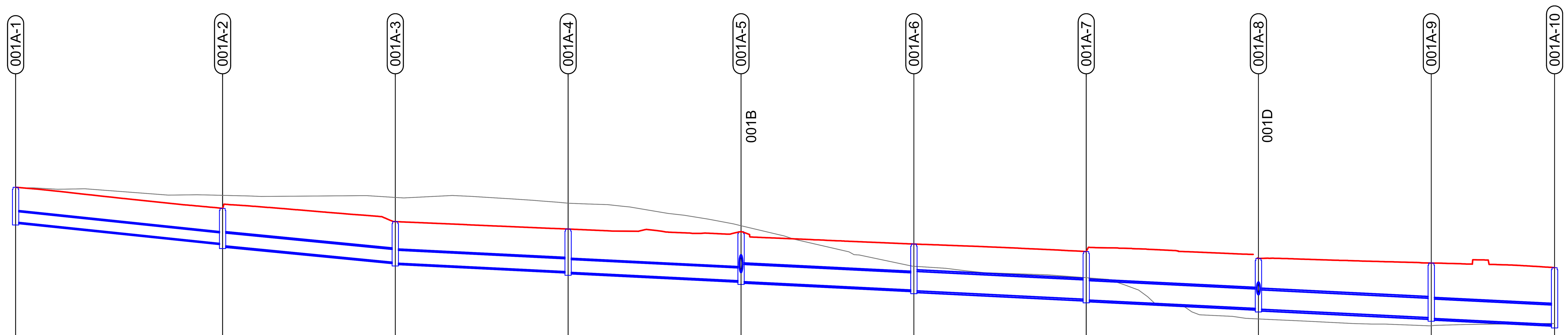
Drawing Status
Issue for Approval

Job No	Drawing No	Issue
264039-00	ARU-SYD-CICW-DRG-0602	A

Do not scale

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

NOTE
1. ALL STORMWATER PIPES CLASS 4 RUBBER RING JOINT REINFORCED CONCRETE



	001A-1		001A-2		001A-3		001A-4		001A-5		001A-6		001A-7		001A-8		001A-9		001A-10
PIPE DIAMETER (mm)		Ø375		Ø450		Ø450		Ø450		Ø600		Ø675		Ø675		Ø675		Ø675	
PIPE TYPE & CLASS		CLASS 4		CLASS 4		CLASS 4		CLASS 4		CLASS 4		CLASS 4		CLASS 4		CLASS 4		CLASS 4	
PIPE GRADE (%)		2.09%		1.95%		1.00%		1.00%		1.00%		1.00%		1.00%		1.00%		1.00%	

DATUM R.L. 45.00

	001A-1		001A-2		001A-3		001A-4		001A-5		001A-6		001A-7		001A-8		001A-9		001A-10
INVERT LEVEL	59.85		59.10 59.04		58.45 58.43		58.13 58.11		57.81 57.79		57.49 57.47		57.17 57.15		56.85 56.83		56.53 56.51		56.30
DESIGN LEVEL	61.06		60.33		59.87		59.61		59.53		59.09		58.83		58.59		58.43		58.27
EXISTING LEVEL	61.06		60.33		59.87		59.61		59.53		59.09		58.83		58.59		58.43		58.27
PIPE CHAINAGE	0.00	35.92	35.92	29.96	65.88	30.00	95.88	30.00	125.88	30.00	155.88	29.91	185.79	29.88	215.67	30.00	245.67	21.39	267.06

LINE.001A

NOT FOR CONSTRUCTION

Scales
Scale H1:500 — A1 / A3 1:500 / 1:1000
Scale V1:100 — A1 / A3 1:100 / 1:200

Filename (Full Drawing No)
WSERRC-ARU-SYD-CICW-DRG-0641
Design Model Version

Issue	Date	By	Chkd	Appd
A	29/06/20	HNA	AC	EM
	FOR APPROVAL			
0	22/05/20	HNA	AC	EM
	FOR PLANNING APPROVAL			

Client
CLEANAWAY WESTERN SYDNEY ENERGY & RESOURCE RECOVERY CENTRE
MACQUARIE

Engineering Certification (CEng)
Name:
Signature: Date:

Job Title
WESTERN SYDNEY ENERGY AND RESOURCE RECOVERY CENTRE

Scale at A1

Discipline
Civil

ARUP
Arup, Barrack Place, Level 5, 151 Clarence St Sydney, NSW, 2000
Tel +61 (02) 9320 9320 Fax +61 (02) 9320 9321
www.arup.com

CONSULT AUSTRALIA
Member Firm
Arup Pty Ltd ABN 18 000 966 165

Drawing Title
STORMWATER LONGITUDINAL SECTIONS SHEET 1 OF 6

Drawing Status
Issue for Approval

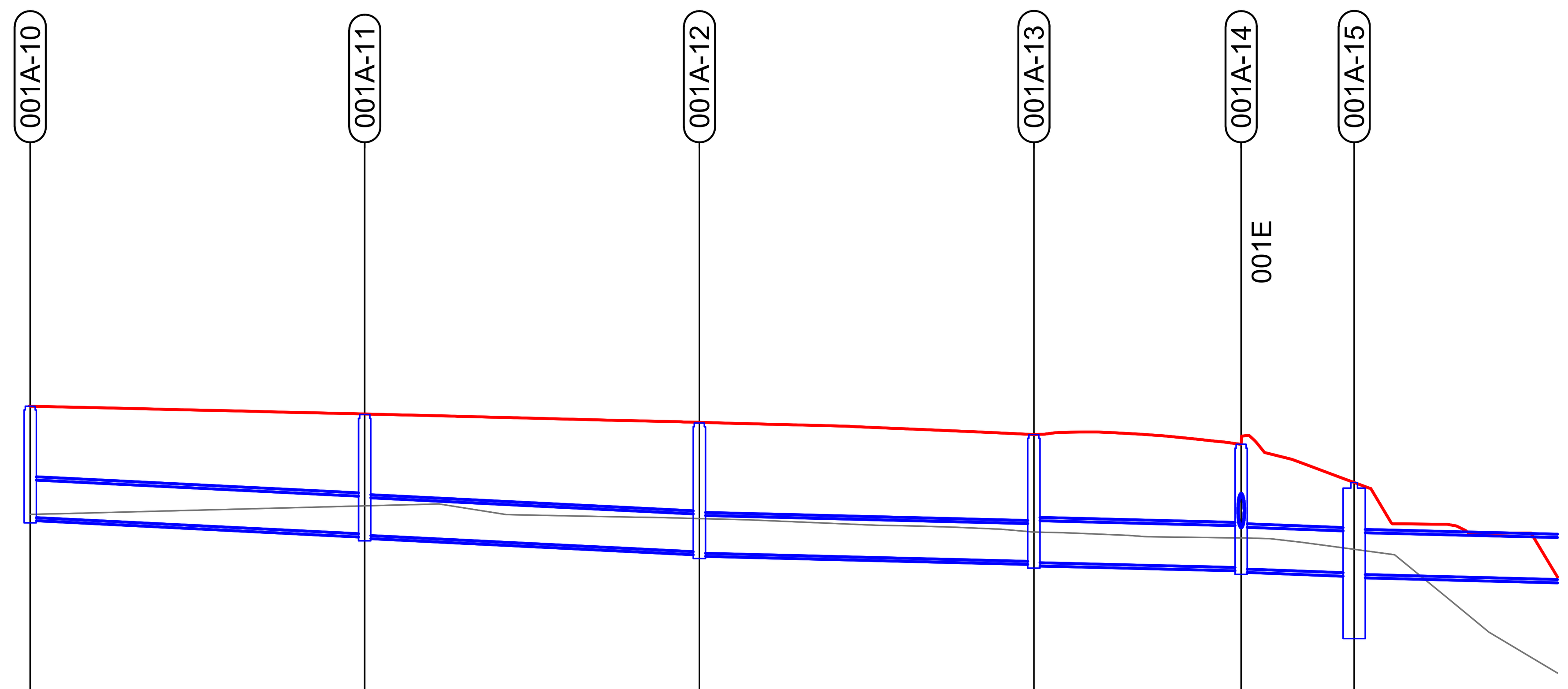
Job No 264039-00
Drawing No ARU-SYD-CICW-DRG-0641
Issue A

Do not scale

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

NOTE

1. ALL STORMWATER PIPES CLASS 4 RUBBER RING JOINT REINFORCED CONCRETE



	001A-10		001A-11		001A-12		001A-13		001A-14		001A-15		
PIPE DIAMETER (mm)		Ø675		Ø675		Ø675		Ø750		Ø750		Ø750	
PIPE TYPE & CLASS		CLASS 4		CLASS 4		CLASS 4		CLASS 4		CLASS 4		CLASS 4	
PIPE GRADE (%)		1.00%		1.00%		0.50%		0.50%		0.77%		0.50%	

DATUM R.L. 45.00

INVERT LEVEL	56.28		55.98 55.96		55.66 55.64		55.49 55.47		55.38 55.36		55.28 55.26		55.16
DESIGN LEVEL	58.27		58.12		57.97		57.77		57.59		56.91		
EXISTING LEVEL	58.27		58.13		57.98		57.77		57.59		56.91		
PIPE CHAINAGE	267.06	30.00	297.06	30.00	327.06	30.00	357.06	18.58	375.64	10.13	385.78	18.86	404.64

LINE.001A

NOT FOR CONSTRUCTION

Scales: Scale H1:500 — A1 / A3 1:500 / 1:1000; Scale V1:100 — A1 / A3 1:100 / 1:200

Filename (Full Drawing No): WSERRC-ARU-SYD-CICW-DRG-0642
Design Model Version

Issue	Date	By	Chkd	Appd
A	29/06/20	HNA	AC	EM
	FOR APPROVAL			
0	22/05/20	HNA	AC	EM
	FOR PLANNING APPROVAL			

Client: CLEANAWAY WESTERN SYDNEY ENERGY & RESOURCE RECOVERY CENTRE; MACQUARIE

Engineering Certification (CEng)
Name: ....
Signature: .... Date: ....

Job Title: WESTERN SYDNEY ENERGY AND RESOURCE RECOVERY CENTRE

Scale at A1
Discipline: Civil

ARUP
Arup, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61 (02) 9320 9320 Fax +61 (02) 9320 9321
www.arup.com

CONSULT AUSTRALIA Member Firm
Arup Pty Ltd ABN 18 000 966 165

Drawing Title: STORMWATER LONGITUDINAL SECTIONS SHEET 2 OF 6

Drawing Status: Issue for Approval

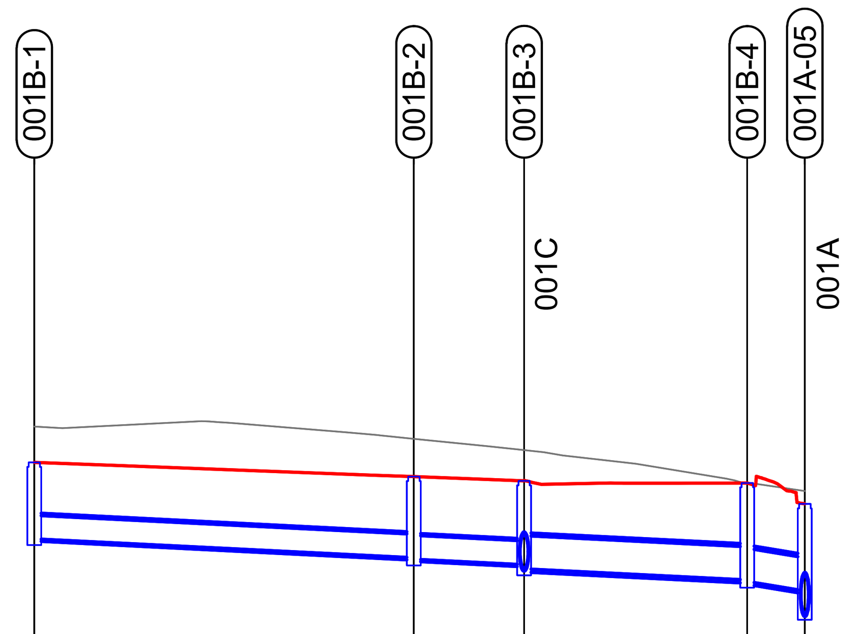
Job No: 264039-00 | Drawing No: ARU-SYD-CICW-DRG-0642 | Issue: A

Do not scale

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

NOTE

1. ALL STORMWATER PIPES CLASS 4 RUBBER RING JOINT REINFORCED CONCRETE



PIPE DIAMETER (mm)		Ø375		Ø375		Ø525		Ø525
PIPE TYPE & CLASS		CLASS 4		CLASS 4		CLASS 4		CLASS 4
PIPE GRADE (%)		1.00%		1.00%		1.00%		3.29%

DATUM R.L. 50.00

	001B-1		001B-2		001B-3		001B-4		001A-05
INVERT LEVEL	58.97		58.67 58.65		58.57 58.50		58.32 58.30		58.15
DESIGN LEVEL	60.18		59.96		59.89		59.86		59.53
EXISTING LEVEL	60.18		59.96		59.89		59.86		59.53
PIPE CHAINAGE	0.00	30.00	30.00	8.71	38.71	17.64	56.35	4.55	60.90

LINE.001B

NOT FOR CONSTRUCTION

Scales
0 10 20m A1 / A3 1:500 / 1:1000
Scale H1:500
0 2.5 5m A1 / A3 1:100 / 1:200
Scale V1:100

Filename (Full Drawing No)
WSERRC-ARU-SYD-CICW-DRG-0643
Design Model Version

Issue	Date	By	Chkd	Appd
A	29/06/20	HNA	AC	EM
	FOR APPROVAL			
0	22/05/20	HNA	AC	EM
	FOR PLANNING APPROVAL			

Client
CLEANAWAY WESTERN SYDNEY ENERGY & RESOURCE RECOVERY CENTRE
MACQUARIE

Engineering Certification (CEng)
Name: ....
Signature: .... Date: ....

Job Title
WESTERN SYDNEY ENERGY AND RESOURCE RECOVERY CENTRE

Scale at A1

Discipline
Civil

ARUP

Arup, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61 (02) 9320 9320 Fax +61 (02) 9320 9321
www.arup.com

CONSULT AUSTRALIA
Member Firm
Arup Pty Ltd
ABN 18 000 966 165

Drawing Title
STORMWATER LONGITUDINAL SECTIONS SHEET 3 OF 6

Drawing Status
Issue for Approval

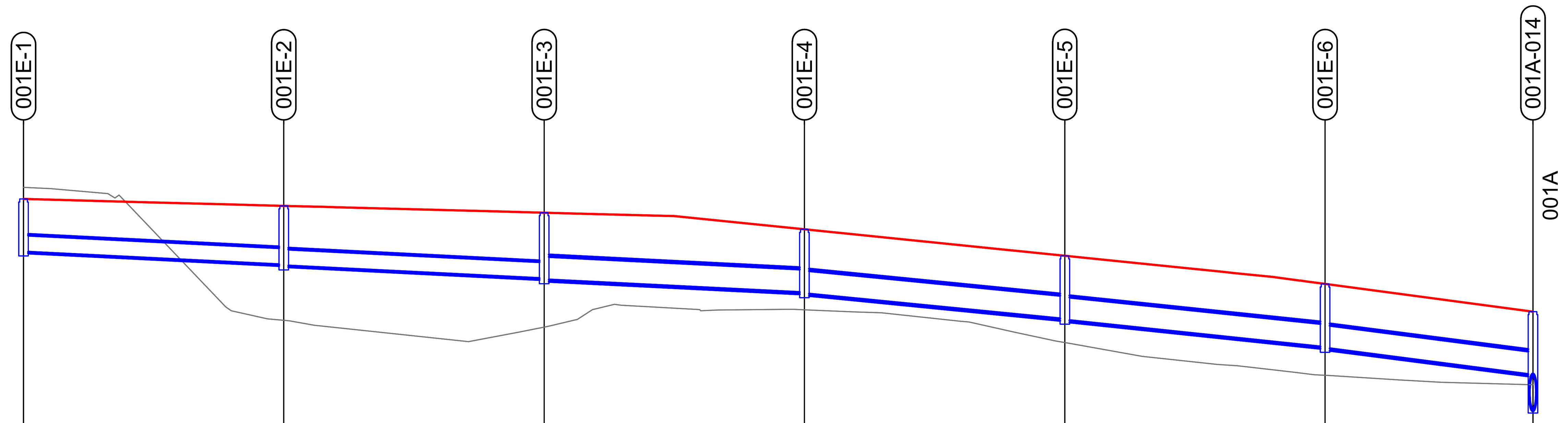
Job No	Drawing No	Issue
264039-00	ARU-SYD-CICW-DRG-0643	A

Do not scale

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

NOTE

1. ALL STORMWATER PIPES CLASS 4 RUBBER RING JOINT REINFORCED CONCRETE



	001E-1 to 001E-2	001E-2 to 001E-3	001E-3 to 001E-4	001E-4 to 001E-5	001E-5 to 001E-6	001E-6 to 001A-014
PIPE DIAMETER (mm)	Ø375	Ø375	Ø525	Ø525	Ø525	Ø525
PIPE TYPE & CLASS	CLASS 4	CLASS 4	CLASS 4	CLASS 4	CLASS 4	CLASS 4
PIPE GRADE (%)	1.00%	1.00%	1.00%	1.97%	2.09%	2.58%

DATUM R.L. 45.00

	001E-1		001E-2		001E-3		001E-4		001E-5		001E-6		001A-014
INVERT LEVEL	58.97		58.67 58.65		58.35 58.33		58.03 58.01		57.42 57.40		56.78 56.76		56.14
DESIGN LEVEL	60.18		60.03		59.87		59.49		58.88		58.23		57.59
EXISTING LEVEL	60.18		60.03		59.87		59.49		58.88		58.23		57.59
PIPE CHAINAGE	0.00	30.00	30.00	30.00	60.00	30.00	90.00	30.00	120.00	30.00	150.00	23.95	173.95

LINE.001E

NOT FOR CONSTRUCTION

Scales
0 10 20m A1 / A3 1:500 / 1:1000
Scale H1:500
0 2.5 5m A1 / A3 1:100 / 1:200
Scale V1:100
Filename (Full Drawing No)
WSERRC-ARU-SYD-CICW-DRG-0644
Design Model Version

Issue	Date	By	Chkd	Appd
A	29/06/20	HNA	AC	EM
	FOR APPROVAL			
0	22/05/20	HNA	AC	EM
	FOR PLANNING APPROVAL			

Client
CLEANAWAY WESTERN SYDNEY ENERGY & RESOURCE RECOVERY CENTRE
MACQUARIE
Engineering Certification (CEng)
Name: ....
Signature: .... Date: ....

Job Title
WESTERN SYDNEY ENERGY AND RESOURCE RECOVERY CENTRE
Scale at A1
Discipline
Civil

ARUP
Arup, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61 (02) 9320 9320 Fax +61 (02) 9320 9321
www.arup.com
CONSULT AUSTRALIA
Member Firm
Arup Pty Ltd
ABN 18 000 966 165

Drawing Title
STORMWATER LONGITUDINAL SECTIONS SHEET 4 OF 6
Drawing Status
Issue for Approval
Job No
264039-00
Drawing No
ARU-SYD-CICW-DRG-0644
Issue
A

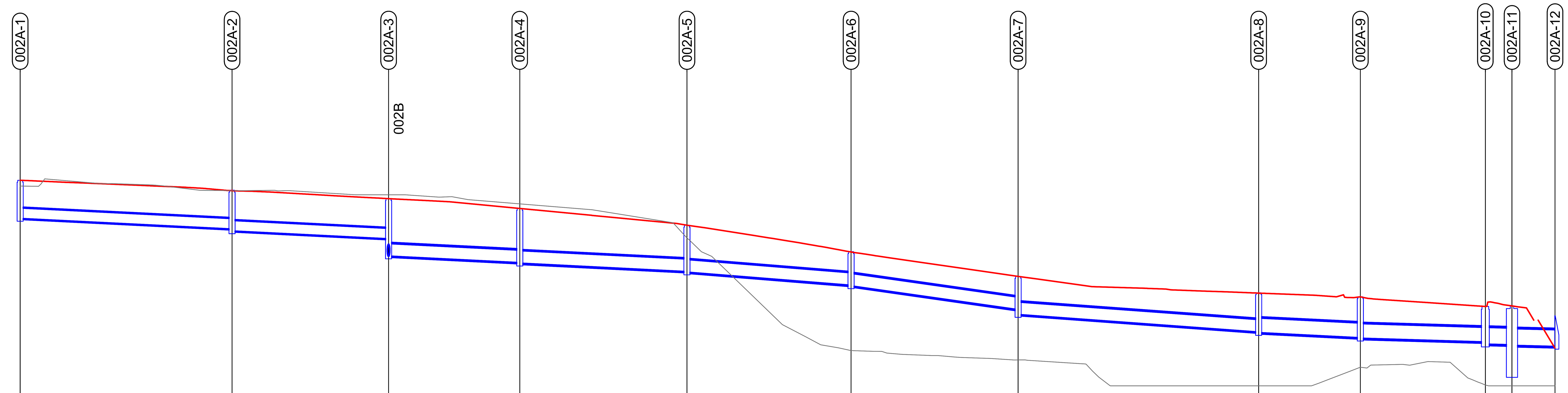
Do not scale

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

A1

A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P

NOTE
1. ALL STORMWATER PIPES CLASS 4 RUBBER RING JOINT REINFORCED CONCRETE



PIPE DIAMETER (mm)	PIPE TYPE & CLASS	PIPE GRADE (%)	PIPE CHAINAGE (length)
Ø375	CLASS 4	1.00%	38.02
Ø375	CLASS 4	1.00%	28.08
Ø450	CLASS 4	1.00%	23.53
Ø450	CLASS 4	1.00%	30.00
Ø450	CLASS 4	1.61%	29.44
Ø450	CLASS 4	2.85%	29.98
Ø450	CLASS 4	1.46%	43.15
Ø525	CLASS 4	1.00%	18.25
Ø525	CLASS 4	0.59%	22.42
Ø600	CLASS 4	0.50%	4.78
Ø600	CLASS 4	0.50%	7.71

DATUM R.L. 45.00

	INVERT LEVEL	DESIGN LEVEL	EXISTING LEVEL	PIPE CHAINAGE
002A-1	59.65	61.02	61.02	0.00
002A-2	59.27 59.20	60.66	60.66	38.02
002A-3	58.92 58.30	60.36	60.36	66.09
002A-4	58.06 58.04	60.01	60.01	89.63
002A-5	57.74 57.72	59.41	59.41	119.63
002A-6	57.25 57.23	58.46	58.46	149.07
002A-7	56.38 56.20	57.57	57.57	179.04
002A-8	55.57 55.55	56.98	56.98	222.20
002A-9	55.37 55.35	56.84	56.84	240.45
002A-10	55.22 55.14	56.49	56.49	262.86
002A-11	55.12 55.10	56.51	56.51	267.64
002A-12	55.06	56.16	55.00	275.36

LINE.002A

NOT FOR CONSTRUCTION

Scales
0 10 20m A1 / A3 1:500 / 1:1000
Scale H1:500
0 2.5 5m A1 / A3 1:100 / 1:200
Scale V1:100

Filename (Full Drawing No)
WSERRC-ARU-SYD-CICW-DRG-0645
Design Model Version

Issue	Date	By	Chkd	Appd
A	29/06/20	HNA	AC	EM
	FOR APPROVAL			
0	22/05/20	HNA	AC	EM
	FOR PLANNING APPROVAL			

Client
CLEANAWAY WESTERN SYDNEY ENERGY & RESOURCE RECOVERY CENTRE
MACQUARIE

Engineering Certification (CEng)
Name: ....
Signature: .... Date: ....

Job Title
WESTERN SYDNEY ENERGY AND RESOURCE RECOVERY CENTRE

Scale at A1

Discipline
Civil

ARUP
Arup, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61 (02) 9320 9320 Fax +61 (02) 9320 9321
www.arup.com

CONSULT AUSTRALIA
Member Firm
Arup Pty Ltd
ABN 18 000 966 165

Drawing Title
STORMWATER LONGITUDINAL SECTIONS SHEET 5 OF 6

Drawing Status
Issue for Approval

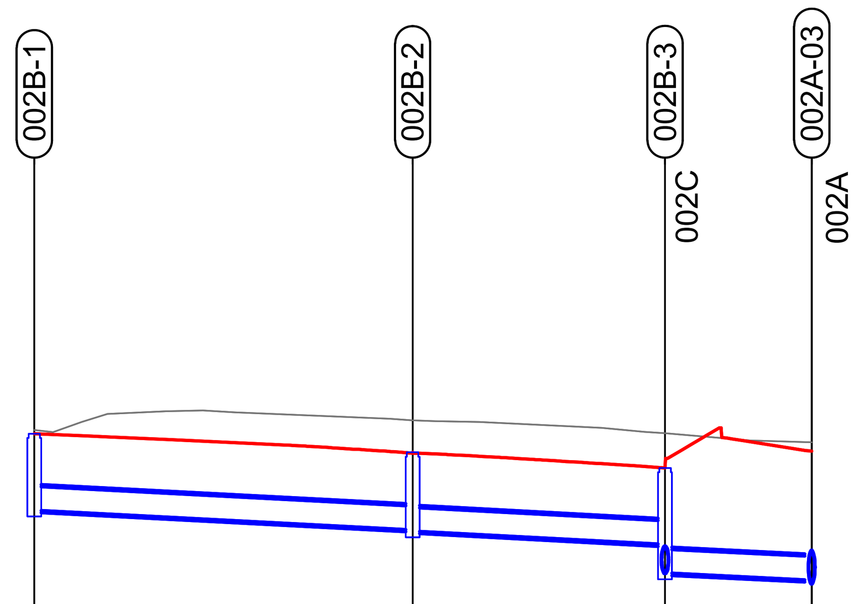
Job No	Drawing No	Issue
264039-00	ARU-SYD-CICW-DRG-0645	A

Do not scale

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

NOTE

1. ALL STORMWATER PIPES CLASS 4 RUBBER RING JOINT REINFORCED CONCRETE



PIPE DIAMETER (mm)	Ø375	Ø375	Ø375
PIPE TYPE & CLASS	CLASS 4	CLASS 4	CLASS 4
PIPE GRADE (%)	1.04%	1.06%	1.00%

DATUM R.L. 50.00

	002B-1		002B-2		002B-3		002A-03
INVERT LEVEL	59.43		59.12 / 59.10		58.88 / 58.44		58.32
DESIGN LEVEL	60.64		60.34		60.10		60.36
EXISTING LEVEL	60.64		60.34		60.10		60.36
PIPE CHAINAGE	0.00	29.90	29.90	19.95	49.85	11.58	61.44

LINE.002B

NOT FOR CONSTRUCTION

Scales
0 10 20m A1 / A3 1:500 / 1:1000
Scale H1:500
0 2.5 5m A1 / A3 1:100 / 1:200
Scale V1:100

Filename (Full Drawing No)
WSERRC-ARU-SYD-CICW-DRG-0646
Design Model Version

Issue	Date	By	Chkd	Appd
A	29/06/20	HNA	AC	EM
	FOR APPROVAL			
0	22/05/20	HNA	AC	EM
	FOR PLANNING APPROVAL			

Client
CLEANAWAY WESTERN SYDNEY ENERGY & RESOURCE RECOVERY CENTRE
MACQUARIE

Engineering Certification (CEng)
Name: ....
Signature: .... Date: ....

Job Title
WESTERN SYDNEY ENERGY AND RESOURCE RECOVERY CENTRE

Scale at A1

Discipline
Civil

ARUP

Arup, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61 (02) 9320 9320 Fax +61 (02) 9320 9321
www.arup.com

CONSULT AUSTRALIA
Member Firm
Arup Pty Ltd
ABN 18 000 966 165

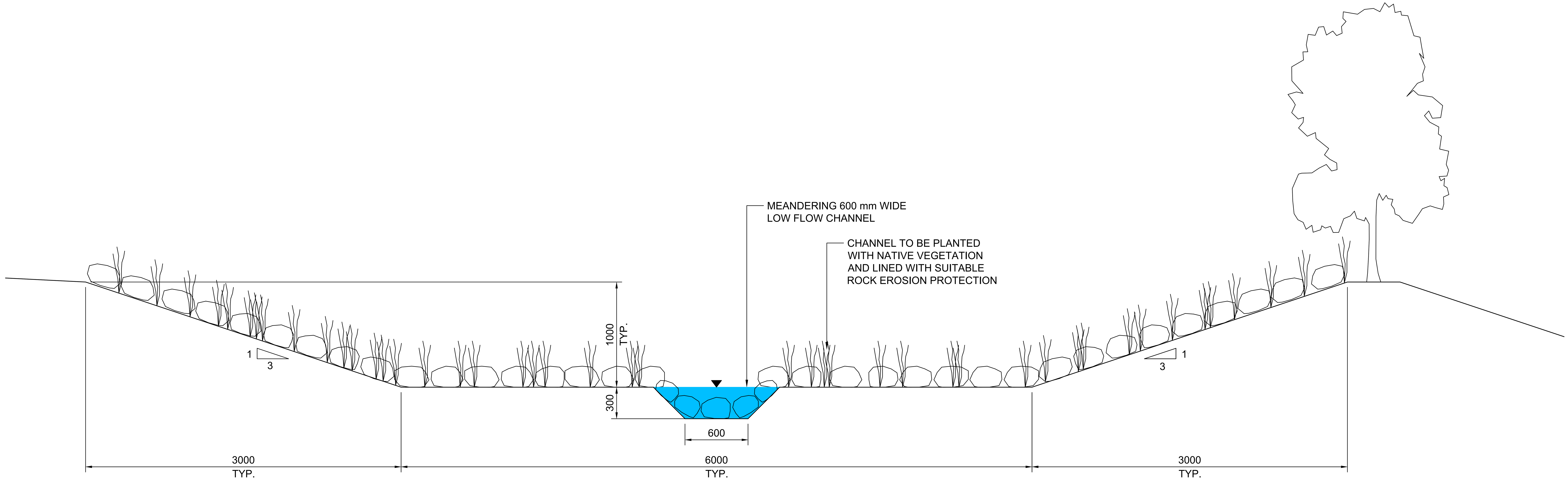
Drawing Title
STORMWATER
LONGITUDINAL SECTIONS
SHEET 6 OF 6

Drawing Status
Issue for Approval

Job No	Drawing No	Issue
264039-00	ARU-SYD-CICW-DRG-0646	A

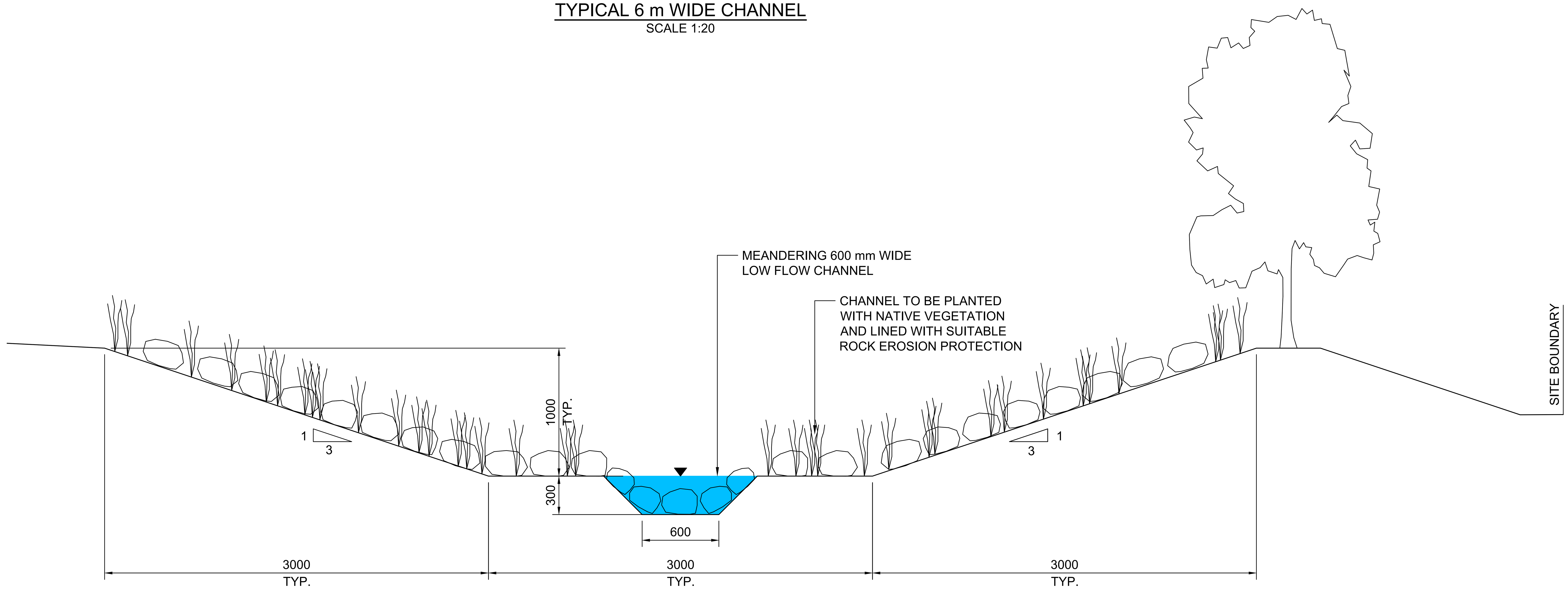
Do not scale

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR



TYPICAL 6 m WIDE CHANNEL

SCALE 1:20



TYPICAL 3 m WIDE CHANNEL

SCALE 1:20

Scales

0 500 1000mm A1 / A3
1:20 / 1:40

Filename (Full Drawing No)
WSERRC-ARU-SYD-CICW-DRG-0691
Design Model Version

Issue	Date	By	Chkd	Appd
A	29/06/20	HNA	AC	EM
	FOR APPROVAL			
0	22/05/20	HNA	AC	EM
	FOR PLANNING APPROVAL			

Client

CLEANAWAY WESTERN SYDNEY ENERGY & RESOURCE RECOVERY CENTRE

MACQUARIE

Engineering Certification (CEng)
Name: ....
Signature: .... Date: ....

Job Title
WESTERN SYDNEY ENERGY AND RESOURCE RECOVERY CENTRE

Scale at A1 1:20mm

Discipline Civil

ARUP

Arup, Barrack Place, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61 (02) 9320 9320 Fax +61 (02) 9320 9321
www.arup.com

CONSULT AUSTRALIA
Member Firm
Arup Pty Ltd
ABN 18 000 966 165

Drawing Title
STORMWATER
GRASS CHANNEL
TYPICAL SECTION

Drawing Status
Issue for Approval

Job No	Drawing No	Issue
264039-00	ARU-SYD-CICW-DRG-0691	A

Do not scale

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

Appendix D

Statement of CIV

Rider Levett Bucknall

Rider Levett Bucknall NSW Pty Ltd
ABN 94 003 234 026

Level 19, 141 Walker Street
PO Box 531
North Sydney NSW 2059
Australia

Tel: +61 2 9922 2277
Fax: +61 2 9957 4197
Email: sydney@au.rlb.com

17384.6.1.CIV.ac.rj

8 August 2020

Cleanaway Operations Pty Ltd
Macquarie Corporate Holdings Pty Ltd
Level 6, 50 Martin Place,
Sydney NSW 2000

Dear Sirs

WESTERN SYDNEY ENERGY AND RESOURCE RECOVERY CENTRE
CAPITAL INVESTMENT VALUE ESTIMATE

Please find attached our revised Capital Investment Value (CIV) Estimate for the Western Sydney Energy and Resource Recovery Centre (WSERRC).

The CIV for the development has been prepared in accordance with the definition of CIV in the EP&A Regulation and includes all costs necessary to establish and operate the project, including the design and construction of buildings, structures, associated infrastructure and fixed or mobile plant and equipment, other than the following costs:

(a) amounts payable, or the cost of land dedicated, or any other benefit provided, under a condition imposed under Division 7.1 or 7.2 of the Act or a planning agreement under that Division,

(b) costs relating to any part of the development or project that is the subject of a separate development consent or project approval,

(c) land costs (including any costs of marketing and selling land),

(d) GST (within the meaning of A New Tax System (Goods and Services Tax) Act 1999 of the Commonwealth).

The estimate is based on information contained within the Front-End Engineering Design (FEED) Report provided by Arup (Ref WSERRC-ARU-SYD-GLDM-RPT-0001 Issue 1 dated 25 May 2020) including the architectural, civil and structural drawings contained within appendices to that report.

The estimate is based on the following key assumptions:

(i) Construction is undertaken at the site located at 339 Wallgrove Road in Eastern Creek, NSW (Lot 1 DP 1059698) which is in the Blacktown local government area (LGA).

(ii) Bulk earthworks quantities for cut and fill, including re-use of material on site, have been provided by Arup.

(iii) Costs for process plant and equipment are based on a preliminary CAPEX budget for the process equipment for WSERRC provided by Ramboll Danmark A/S (Copenhagen, Denmark) dated 18 June 2020.

(iv) Construction of the WSERRC facility will be undertaken over approximately 3 years and will include the following five main construction phases:

– Phase 1 - Demolition
– Phase 2 - Site Establishment and Enabling Works
– Phase 3 - Main Construction Works
– Phase 4 – Testing and Commissioning Works

– Phase 5 - Finishing and Landscaping Works

(v) Rates are current as at June 2020.

(vi) GST is excluded.

It is estimated that the proposal will create 900 direct construction jobs over the 3-year construction period and in addition between 700-1200 indirect construction jobs.

Approximately 50 full-time equivalent employees and contractors will be employed at peak operations.

We certify that the information provided is accurate at the date of preparation.

Yours faithfully,

Matthew Harris
Managing Director
Rider Levett Bucknall

matthew.harris@au.rlb.com

PROJECT GREEN WARATAH

INDICATIVE ORDER OF COST BUDGET ESTIMATE JULY 2020

Rider Levett Bucknall

Project Green Waratah

Indicative Order of Cost Budget Estimate July 2020

Location Summary

GFA: Gross Floor Area
Rates Current At June 2020

Location			GFA m²	Cost/m²	Total Cost
EW	**ENABLING WORKS**				
D	Demolition Works				1,181,000
E	Earthworks				6,534,600
SD	Services Diversions				604,300
		EW - ENABLING WORKS			***$8,319,900***
FB	**FACILITY BUILDINGS**				
MF	Main Facility		26,799	5,220	139,898,500
OA	Operations Admin		6,438	3,295	21,210,600
S	Stack				2,183,300
VC	Visitor Centre		648	6,315	4,092,300
ACC	ACC Building		1,687	3,863	6,516,900
SB	Substation Building		1,680	3,012	5,060,000
		FB - FACILITY BUILDINGS	***37,252***	***$4,804***	***$178,961,600***
EA	**EXTERNAL AREAS**				
HS	Hardstands and Parking				3,117,700
RB	Bio-Retention Basin				184,000
DB	Detention Basin				593,900
L	Landscaping				13,462,300
SQ	Special Equipment				2,150,000
SW	Stormwater Drainage				696,000
		EA - EXTERNAL AREAS			***$20,203,900***
		ESTIMATED NET COST	**37,252**	**$5,570**	**$207,485,400**
MARGINS & ADJUSTMENTS					
Design Fees		6.0%			$12,449,100
Preliminaries		18.0%			$39,588,200
Overheads & Margin		5.0%			$12,976,100
SUBTOTAL			**37,252**	**$7,315**	**$272,498,800**
Construction Contingency		10.0%			$27,250,100
SUBTOTAL			**37,252**	**$8,047**	**$299,748,900**
Professional Fees to completion		5.0%			$14,987,400
Statutory Authority Fees					Excl.
Escalation from May 2020					Excl.
NET CONSTRUCTION COSTS			**37,252**	**$8,449**	**$314,736,300**
MAIN FACILITY PROCESS EQUIPMENT					
Furnace / Boiler System		57.2%			$180,000,000
Turbine / Generator / ACC		8.1%			$40,000,000

Project Green Waratah

Indicative Order of Cost Budget Estimate July 2020

Location Summary

GFA: Gross Floor Area
Rates Current At June 2020

Location		GFA m²	Cost/m²	Total Cost
MARGINS & ADJUSTMENTS (continued)				
Flue Gas Treatment System	11.2%			$60,000,000
Balance of Special Plant & Equipment	3.4%			$20,000,000
Electrical / CMS	4.9%			$30,000,000
GROSS CONSTRUCTION COSTS		**37,252**	**$17,307**	**$644,736,300**
ESTIMATED TOTAL COST		**37,252**	**$17,307**	**$644,736,300**

Project Green Waratah
Indicative Order of Cost Budget Estimate July 2020
Location Element/Trade/Main heading/Sub heading Item

EW ENABLING WORKS
D Demolition Works

Rates Current At June 2020

Description		Unit	Qty	Rate	Total
DE	**DEMOLITION**				
DE	**DEMOLITION**				
44	Demolition of existing farming sheds	m²	14,200	80	1,136,000
46	Removal of existing electrical poles	No	3	15,000	45,000
	DEMOLITION				***$1,181,000***
	DEMOLITION				***$1,181,000***
	DEMOLITION WORKS				***$1,181,000***

Project Green Waratah

Indicative Order of Cost Budget Estimate July 2020

Location Element/Trade/Main heading/Sub heading Item

EW ENABLING WORKS

E Earthworks

Rates Current At June 2020

Description		Unit	Qty	Rate	Total
XP	**SITE PREPARATION**				
EX	**EXTERIOR ELEMENTS**				
52	Allowance to clear site	m^2	56,590	6	283,000
53	Removal of trees and clear vegetation	m^2	12,950	16	194,300
141	General excavation in rock; cut to fill	m^3	27,300	80	2,184,000
144	Imported or Borrowed Material (other than Selected Material, Verge Material and Foundation Treatment Material). Assume a free supply of suitable material from another project/site 60km away	m^3	10,990	65	703,400
145	General excavation in fill and residual soil; cut to fill	m^3	26,600	40	1,064,000
148	Excavate and disposal of unsuitable material offsite, including tipping and levy. (Assume tipping to Eastern Creek Tip next to site), Allowance of 15% of cut/fill in residual soil quantity (80% GSW, 20% RSW)	m^3	3,990	483	1,923,200
151	Place and compact total fill volume	m^3	60,900	3	182,700
	EXTERIOR ELEMENTS				***$6,534,600***
	SITE PREPARATION				***$6,534,600***
	EARTHWORKS				***$6,534,600***

Description		Unit	Qty	Rate	Total
HS	**HYDRAULIC SERVICES**				
HY	**HYDRAULICS**				
69	Allowance to connect into existing water mains	Item			50,000
	HYDRAULICS				***$50,000***
	HYDRAULIC SERVICES				***$50,000***
XX	**ALTERATIONS AND RENOVATIONS TO EXISTING EXTERNAL WORKS**				
HY	**HYDRAULICS**				
50	Allowance to decommission and remove existing water supply services	m	222	400	88,800
51	Allowance to decommission and remove existing sewer main services	m	23	400	9,200
	HYDRAULICS				***$98,000***
DR	**DRAINAGE**				
49	Allowance to decommission and remove existing stormwater services	m	411	300	123,300
	DRAINAGE				***$123,300***
EL	**ELECTRICAL INSTALLATIONS**				
47	Allowance to decommission and remove existing electrical services	m	700	300	210,000
48	Allowance to decommission and remove existing communications services	m	615	200	123,000
	ELECTRICAL INSTALLATIONS				***$333,000***
	ALTERATIONS AND RENOVATIONS TO EXISTING EXTERNAL WORKS				***$554,300***
	SERVICES DIVERSIONS				***$604,300***

Project Green Waratah

Indicative Order of Cost Budget Estimate July 2020

Location Element/Trade/Main heading/Sub heading Item

FB FACILITY BUILDINGS
MF Main Facility

GFA: 26,799 m² Cost/m²: $5,220
Rates Current At June 2020

Description		Unit	Qty	Rate	Total
SB	**SUBSTRUCTURE**				
PI_P	**PILING**				
6	1000mm thick secant pile wall - anchors and shotcreting msd sep (assume N40, 140kg/m3 reo)	m²	1,222	1,600	1,955,200
36	Allows for tension piling supporting Bunker and preventing uplift (slab area msd)	m²	1,446	350	506,100
37	Piles supporting internal Boiler Hall columns, 13m deep (assume 600mm dia, N40, 120kg/m3 reo)	m	208	500	104,000
42	800mm thick secant pile wall - anchors and shotcreting msd sep (assume N40, 140kg/m3 reo)	m²	2,724	1,400	3,813,600
64	Anchoring and shotcreting to 1000mm thick secant pile wall	m²	789	400	315,600
65	Anchoring and shotcreting to 8000mm thick secant pile wall	m²	1,759	400	703,600
133	Piles supporting internal FGT Hall columns, 9m deep (assume 900mm dia, N40, 120kg/m3 reo)	m	216	600	129,600
134	Piles supporting internal Turbine support columns, 17m deep (assume 1200mm dia, N40, 120kg/m3 reo)	m	102	1,000	102,000
135	Piles supporting internal Boiler Hall columns under Superheater Exchange, 17m deep (assume 1200mm dia, N40, 120kg/m3 reo)	m	136	1,000	136,000
136	Piles caps for 600mm dia. piles (assume 900 x 900 x 400mm deep, N40, 240kg/m3 reo)	No	16	838	13,400
137	Piles caps for 900mm dia. piles (assume 1200 x 1200 x 500mm deep, N40, 240kg/m3 reo)	No	24	1,392	33,400
	PILING			***$292/m²***	***$7,812,500***
CN_C	**CONCRETE - CONCRETE ITEMS**				
1	200mm thick RC slab on ground	m²	7,777	180	1,399,800
2	600mm thick RC restraining slab on ground (assume N40, 160kg/m3 reo)	m²	510	880	448,800
3	1000mm thick RC Waste Bunker slab on ground (assume N40, 160kg/m3 reo)	m²	1,446	1,100	1,590,600
4	2000mm thick RC piled raft slab on ground (assume N40, 160kg/m3 reo)	m²	163	2,391	389,600
27	4000mm width x 1500mm deep RC ground beam (assume N40, 160kg/m3 reo)	m	57	5,820	331,700
30	2000mm width x 600mm deep RC ground beam (assume N40, 160kg/m3 reo)	m	62	1,260	78,100
70	Concrete topping slab as protection for tanking membrane	m²	1,446	120	173,500
71	Concrete wall as protection for tanking membrane	m²	2,548	300	764,400
91	600mm thick RC buttress walls, below ground (assume N40, 200kg/m3 reo)	m²	244	910	222,000
139	Allowance for strip footings for external upstand walls	m	373	851	317,100
140	Allowance for strip footings for internal load walls	m	1,396	750	1,047,000
	CONCRETE - CONCRETE ITEMS			***$252/m²***	***$6,762,600***

Description		Unit	Qty	Rate	Total
CN_M	**CONCRETE - TANKING**				
66	Tanking membrane to Bunker walls below ground	m²	2,548	175	445,900
67	Tanking membrane to Bunker slab	m²	1,446	176	253,100
68	Tanking membrane joint to intersection of Bunker slab and walls below ground	m	165	200	33,000
	CONCRETE - TANKING			***$27/m²***	***$732,000***
	SUBSTRUCTURE			***$571/m²***	***$15,307,100***
CL	**COLUMNS**				
SS	**STRUCTURAL STEEL**				
14	Column, 310UC	t	27.69	7,501	207,700
15	Column, 400WC	t	528.00	7,500	3,960,000
16	Column, 500WC	t	51.40	7,500	385,500
17	Column, 700WB	t	83.25	7,501	624,400
18	Column, 900WB	t	446.44	7,500	3,348,300
87	Allowance for structural steel connections incl columns, beams, trusses, etc (allow 10%)	t	317.92	7,500	2,384,400
	STRUCTURAL STEEL			***$407/m²***	***$10,910,300***
PA	**PAINTING**				
90	Allowance for intumescent coatings to structural steel incl columns, beams, trusses, etc (say 30% required)	m²	12,196	200	2,439,200
	PAINTING			***$91/m²***	***$2,439,200***
	COLUMNS			***$498/m²***	***$13,349,500***
UF	**UPPER FLOORS**				
CN_C	**CONCRETE - CONCRETE ITEMS**				
13	150mm thick RC bondek slab (assume N40, 120kg/m3 reo)	m²	10,249	441	4,509,600
26	200mm thick RC bondek slab (assume N40, 120kg/m3 reo)	m²	2,792	481	1,340,200
28	4000mm width x 1500mm deep RC suspended beam (assume N40, 180kg/m3 reo)	m	70	7,300	511,000
29	1500mm width x 1500mm deep RC suspended beam (assume N40, 180kg/m3 reo)	m	70	3,060	214,200
31	Waller beam for wall deflection for crane	m	81	5,000	405,000
155	1500mm width x 200mm deep RC suspended beam (assume N40, 180kg/m3 reo)	m	70	650	45,500
	CONCRETE - CONCRETE ITEMS			***$262/m²***	***$7,025,500***
SS	**STRUCTURAL STEEL**				
19	Beam, 1200WB317	t	19.79	7,499	148,400
20	Beam, 800WB	t	109.19	7,500	818,900
22	Beam, 530UB	t	222.68	7,501	1,670,100

FB FACILITY BUILDINGS
MF Main Facility (continued)

GFA: 26,799 m² Cost/m²: $5,220
Rates Current At June 2020

Description		Unit	Qty	Rate	Total
88	Truss, 2500mm deep 310UC	t	120.25	7,501	901,900
	STRUCTURAL STEEL			***$132/m²***	***$3,539,300***
	UPPER FLOORS			***$394/m²***	***$10,564,800***
SC	**STAIRCASES**				
CN_C	**CONCRETE - CONCRETE ITEMS**				
178	Allowance for fire stairs	M/R	158	2,600	410,800
	CONCRETE - CONCRETE ITEMS			***$15/m²***	***$410,800***
	STAIRCASES			***$15/m²***	***$410,800***
RF	**ROOF**				
SS	**STRUCTURAL STEEL**				
23	Truss, 2500mm deep 310UC	t	1,542.72	7,501	11,570,400
89	Beam, 530UB (assumed)	t	27.78	7,502	208,400
152	Allowance for purlins for lightweight roofs	m	10,116	45	455,200
154	Allowance for structural roof frame (allowed 30kg/m2)	t	5.50	7,500	41,300
	STRUCTURAL STEEL			***$458/m²***	***$12,275,300***
RF	**ROOFING**				
109	Allowance for roof safety system	Item			220,000
130	Lightweight roof, incl sheet metal roofing, insulation, safety mesh, trims and drainage	m²	12,235	151	1,835,300
131	Lightweight roof to Blades, incl sheet metal roofing, insulation, safety mesh, trims and drainage	m²	2,692	150	403,800
153	EO for detachable roof for Boiler maintenance	m²	417	500	208,500
	ROOFING			***$100/m²***	***$2,667,600***
	ROOF			***$558/m²***	***$14,942,900***
EW	**EXTERNAL WALLS**				
CN_C	**CONCRETE - CONCRETE ITEMS**				
8	1000mm thick RC Waste Bunker walls (assume N40, 200kg/m3 reo)	m²	1,386	1,450	2,009,700
11	200mm thick RC upstand walls (assume N40, 120kg/m3 reo)	m²	2,311	581	1,340,400
	CONCRETE - CONCRETE ITEMS			***$125/m²***	***$3,350,100***
FC	**FACADES**				
120	Solid monolithic blades infill, brick cladded facade incl sub-frame / secondary steel	m²	5,253	800	4,202,400
121	Living walls, green walls incl sub-frame / secondary steel	m²	1,911	2,000	3,822,000
122	Shadow zone facade to Waste Reception Hall incl sub-frame / secondary steel (assume sheet metal cladding)	m²	1,503	451	676,400
124	Matt finish metal panel cladding incl sub-frame	m²	2,816	500	1,408,000
125	Opaque screen facade over solid wall (msd sep), incl sub-frame / secondary steel	m²	4,684	500	2,342,000

FB FACILITY BUILDINGS
MF Main Facility (continued)

GFA: 26,799 m² Cost/m²: $5,220
Rates Current At June 2020

Description		Unit	Qty	Rate	Total
126	Glazed curtain wall with semi-transparent metal mesh screen incl secondary structural steelwork (assume double glazed facade)	m²	5,541	1,800	9,973,800
127	Fixed glazing to Operations Admin (assume double glazed facade)	m²	129	751	96,800
128	Shadow zone facade to Operations Admin incl sub-frame / secondary steel (assume sheet metal cladding)	m²	2,429	451	1,093,100
129	Solid monolithic blades, brick cladded banding panels incl sub-frame / secondary steel	m²	6,068	851	5,157,800
	FACADES			***$1,074/m²***	***$28,772,300***
	EXTERNAL WALLS			***$1,199/m²***	***$32,122,400***
ED	**EXTERNAL DOORS**				
DO	**DOORS**				
208	Single fire rated door complete	No	24	1,800	43,200
	DOORS			***$2/m²***	***$43,200***
	EXTERNAL DOORS			***$2/m²***	***$43,200***
NW	**INTERNAL WALLS**				
CN_C	**CONCRETE - CONCRETE ITEMS**				
9	800mm thick RC Waste Bunker walls (assume N40, 200kg/m3 reo)	m²	3,780	1,230	4,649,400
10	1000mm thick RC Waste Bunker walls (assume N40, 200kg/m3 reo)	m²	1,379	1,431	1,972,000
12	600mm thick RC buttress walls, above ground (assume N40, 200kg/m3 reo)	m²	2,193	1,031	2,258,800
32	600mm thick RC walls (assume N40, 120kg/m3 reo)	m²	982	900	883,800
	CONCRETE - CONCRETE ITEMS			***$364/m²***	***$9,764,000***
CN_P	**CONCRETE - PRECAST**				
7	250mm thick precast RC core walls	m²	6,810	421	2,860,200
161	Allowance for precast RC internal walls	m²	15,120	420	6,350,400
	CONCRETE - PRECAST			***$344/m²***	***$9,210,600***
SS	**STRUCTURAL STEEL**				
170	Allowance for secondary steel support and bracing for internal precast walls (say 6kg/m2)	t	181.57	7,501	1,361,800
	STRUCTURAL STEEL			***$51/m²***	***$1,361,800***
GL	**GLAZING**				
162	Allowance for internal glazed walls	m²	242	650	157,300
	GLAZING			***$6/m²***	***$157,300***
	INTERNAL WALLS			***$765/m²***	***$20,493,700***

FB FACILITY BUILDINGS
MF Main Facility (continued)

GFA: 26,799 m² Cost/m²: $5,220
Rates Current At June 2020

Description		Unit	Qty	Rate	Total
ND	**INTERNAL DOORS**				
DO	**DOORS**				
209	Single fire rated door complete	No	181	1,800	325,800
	DOORS			***$12/m²***	***$325,800***
	INTERNAL DOORS			***$12/m²***	***$325,800***
WF	**WALL FINISHES**				
PA	**PAINTING**				
159	Allowance for wall finishes to Main Facility	m²	60,523	10	605,200
	PAINTING			***$23/m²***	***$605,200***
	WALL FINISHES			***$23/m²***	***$605,200***
FF	**FLOOR FINISHES**				
PA	**PAINTING**				
157	Allowance for floor finishes to Main Facility	m²	26,799	21	536,000
	PAINTING			***$20/m²***	***$536,000***
	FLOOR FINISHES			***$20/m²***	***$536,000***
CF	**CEILING FINISHES**				
PA	**PAINTING**				
158	Allowance for ceiling finishes to Main Facility	m²	13,041	51	652,100
	PAINTING			***$24/m²***	***$652,100***
	CEILING FINISHES			***$24/m²***	***$652,100***
FT	**FITMENTS**				
MW	**METALWORK**				
160	Allowance for fitments to Main Facility	m²	26,799	60	1,607,900
	METALWORK			***$60/m²***	***$1,607,900***
	FITMENTS			***$60/m²***	***$1,607,900***
SE	**SPECIAL EQUIPMENT**				
MW	**METALWORK**				
168	Secondary steel required to support Facility equipment incl internal cranes	Item			Excl.
169	Facility equipment incl internal cranes	Item			Excl.
	METALWORK				***Excl.***
	SPECIAL EQUIPMENT				***Excl.***
HS	**HYDRAULIC SERVICES**				
HY	**HYDRAULICS**				
164	Allowance for hydraulic services to Main Facility	m²	26,799	121	3,215,900
	HYDRAULICS			***$120/m²***	***$3,215,900***
	HYDRAULIC SERVICES			***$120/m²***	***$3,215,900***

Description		Unit	Qty	Rate	Total
MS	**MECHANICAL SERVICES**				
ME	**MECHANICAL INSTALLATIONS**				
166	Allowance for mechanical services to Main Facility	m²	26,799	326	8,709,700
	MECHANICAL INSTALLATIONS			***$325/m²***	***$8,709,700***
	MECHANICAL SERVICES			***$325/m²***	***$8,709,700***
FP	**FIRE PROTECTION**				
FS	**FIRE SERVICES**				
165	Allowance for fire services to Main Facility	m²	26,799	141	3,751,900
	FIRE SERVICES			***$140/m²***	***$3,751,900***
	FIRE PROTECTION			***$140/m²***	***$3,751,900***
LP	**ELECTRIC LIGHT AND POWER**				
EL	**ELECTRICAL INSTALLATIONS**				
163	Allowance for electrical services to Main Facility	m²	26,799	451	12,059,600
	ELECTRICAL INSTALLATIONS			***$450/m²***	***$12,059,600***
	ELECTRIC LIGHT AND POWER			***$450/m²***	***$12,059,600***
TS	**TRANSPORTATION SYSTEMS**				
LI	**LIFT INSTALLATIONS**				
167	Allowance for good and access lift to Main Facility (servicing 4 levels)	No	4	300,000	1,200,000
	LIFT INSTALLATIONS			***$45/m²***	***$1,200,000***
	TRANSPORTATION SYSTEMS			***$45/m²***	***$1,200,000***
	MAIN FACILITY			***$5,220/m²***	***$139,898,500***

Project Green Waratah

Indicative Order of Cost Budget Estimate July 2020

Location Element/Trade/Main heading/Sub heading Item

FB FACILITY BUILDINGS
OA Operations Admin

GFA: 6,438 m² Cost/m²: $3,295
Rates Current At June 2020

Description		Unit	Qty	Rate	Total
SB	**SUBSTRUCTURE**				
CN_C	**CONCRETE - CONCRETE ITEMS**				
1	200mm thick RC slab on ground	m²	1,340	180	241,200
172	Allowance for foundations	m²	1,340	200	268,000
	CONCRETE - CONCRETE ITEMS			***$79/m²***	***$509,200***
	SUBSTRUCTURE			***$79/m²***	***$509,200***
CL	**COLUMNS**				
SS	**STRUCTURAL STEEL**				
87	Allowance for structural steel connections incl columns, beams, trusses, etc (allow 10%)	t	26.91	7,500	201,800
119	Allowance for columns (no spec - area msd)	m²	6,438	51	321,900
	STRUCTURAL STEEL			***$81/m²***	***$523,700***
PA	**PAINTING**				
90	Allowance for intumescent coatings to structural steel incl columns, beams, trusses, etc (say 30% required)	m²	1,479	200	295,800
	PAINTING			***$46/m²***	***$295,800***
	COLUMNS			***$127/m²***	***$819,500***
UF	**UPPER FLOORS**				
CN_C	**CONCRETE - CONCRETE ITEMS**				
25	130mm thick RC bondek slab (assume N40, 120kg/m3 reo)	m²	5,174	421	2,173,100
	CONCRETE - CONCRETE ITEMS			***$338/m²***	***$2,173,100***
SS	**STRUCTURAL STEEL**				
21	Beam, 610UB	t	56.16	7,500	421,200
22	Beam, 530UB	t	75.69	7,501	567,700
24	Beam, 360UB	t	33.43	7,500	250,700
	STRUCTURAL STEEL			***$193/m²***	***$1,239,600***
	UPPER FLOORS			***$530/m²***	***$3,412,700***
SC	**STAIRCASES**				
CN_C	**CONCRETE - CONCRETE ITEMS**				
178	Allowance for fire stairs	M/R	55	2,600	143,000
	CONCRETE - CONCRETE ITEMS			***$22/m²***	***$143,000***
MW	**METALWORK**				
179	Allowance for internal access stairs	M/R	17	7,500	127,500
	METALWORK			***$20/m²***	***$127,500***
	STAIRCASES			***$42/m²***	***$270,500***
RF	**ROOF**				
SS	**STRUCTURAL STEEL**				
23	Truss, 2500mm deep 310UC	t	103.81	7,501	778,600
152	Allowance for purlins for lightweight roofs	m	801	45	36,000

	Description	Unit	Qty	Rate	Total
154	Allowance for structural roof frame (allowed 30kg/m2)	t	38.30	7,500	287,200
	STRUCTURAL STEEL			***$171/m²***	***$1,101,800***
RF	**ROOFING**				
109	Allowance for roof safety system	Item			20,000
130	Lightweight roof, incl sheet metal roofing, insulation, safety mesh, trims and drainage	m²	1,102	151	165,300
131	Lightweight roof to Blades, incl sheet metal roofing, insulation, safety mesh, trims and drainage	m²	176	150	26,400
	ROOFING			***$33/m²***	***$211,700***
	ROOF			***$204/m²***	***$1,313,500***
EW	**EXTERNAL WALLS**				
MA	**MASONRY**				
174	Allowance for external block walls	m²	1,081	300	324,300
	MASONRY			***$50/m²***	***$324,300***
FC	**FACADES**				
120	Solid monolithic blades infill, brick cladded facade incl sub-frame / secondary steel	m²	1,310	800	1,048,000
127	Fixed glazing to Operations Admin (assume double glazed facade)	m²	1,196	751	897,000
129	Solid monolithic blades, brick cladded banding panels incl sub-frame / secondary steel	m²	698	851	593,300
	FACADES			***$394/m²***	***$2,538,300***
PT	**PARTITIONS**				
177	Allowance for external framed walls	m²	3,106	111	341,700
	PARTITIONS			***$53/m²***	***$341,700***
	EXTERNAL WALLS			***$498/m²***	***$3,204,300***
ED	**EXTERNAL DOORS**				
DO	**DOORS**				
208	Single fire rated door complete	No	18	1,800	32,400
210	Allowance for large automatic overhead door	No	12	20,000	240,000
	DOORS			***$42/m²***	***$272,400***
	EXTERNAL DOORS			***$42/m²***	***$272,400***
NW	**INTERNAL WALLS**				
CN_P	**CONCRETE - PRECAST**				
7	250mm thick precast RC core walls	m²	2,178	421	914,800
	CONCRETE - PRECAST			***$142/m²***	***$914,800***
MA	**MASONRY**				
175	Allowance for internal block walls	m²	1,143	300	342,900
	MASONRY			***$53/m²***	***$342,900***

Description		Unit	Qty	Rate	Total
GL	**GLAZING**				
162	Allowance for internal glazed walls	m²	90	650	58,500
	GLAZING			***$9/m²***	***$58,500***
PT	**PARTITIONS**				
176	Allowance for internal stud walls	m²	2,415	131	314,000
	PARTITIONS			***$49/m²***	***$314,000***
	INTERNAL WALLS			***$253/m²***	***$1,630,200***
NS	**INTERNAL SCREENS AND BORROWED LIGHTS**				
JO	**JOINERY**				
189	Toilet and shower partitions	No	18	2,000	36,000
	JOINERY			***$6/m²***	***$36,000***
	INTERNAL SCREENS AND BORROWED LIGHTS			***$6/m²***	***$36,000***
ND	**INTERNAL DOORS**				
DO	**DOORS**				
209	Single fire rated door complete	No	115	1,800	207,000
	DOORS			***$32/m²***	***$207,000***
	INTERNAL DOORS			***$32/m²***	***$207,000***
WF	**WALL FINISHES**				
TL	**TILING**				
185	Allowance for wall finishes to wet areas	m²	509	200	101,800
	TILING			***$16/m²***	***$101,800***
PA	**PAINTING**				
182	Allowance for wall finishes to office areas	m²	8,663	15	129,900
188	Allowance for wall finishes to BOH areas	m²	5,403	15	81,000
	PAINTING			***$33/m²***	***$210,900***
	WALL FINISHES			***$49/m²***	***$312,700***
FF	**FLOOR FINISHES**				
TL	**TILING**				
183	Allowance for floor finishes to wet areas	m²	238	220	52,400
	TILING			***$8/m²***	***$52,400***
CA	**CARPETS**				
180	Allowance for floor finishes to office areas	m²	4,682	91	421,400
	CARPETS			***$65/m²***	***$421,400***
PA	**PAINTING**				
186	Allowance for floor finishes to BOH areas	m²	1,520	20	30,400
	PAINTING			***$5/m²***	***$30,400***
	FLOOR FINISHES			***$78/m²***	***$504,200***
CF	**CEILING FINISHES**				
SC	**SUSPENDED CEILINGS**				
181	Allowance for ceiling finishes to office areas	m²	4,682	76	351,200

Rider Levett Bucknall

Project Green Waratah

Indicative Order of Cost Budget Estimate July 2020

Location Element/Trade/Main heading/Sub heading Item

FB FACILITY BUILDINGS
OA Operations Admin (continued)

GFA: 6,438 m² Cost/m²: $3,295
Rates Current At June 2020

Description		Unit	Qty	Rate	Total
184	Allowance for ceiling finishes to wet areas	m²	238	85	20,200
	SUSPENDED CEILINGS			***$58/m²***	***$371,400***
PA	**PAINTING**				
187	Allowance for ceiling finishes to BOH areas	m²	1,520	20	30,400
	PAINTING			***$5/m²***	***$30,400***
	CEILING FINISHES			***$62/m²***	***$401,800***
FT	**FITMENTS**				
MW	**METALWORK**				
190	Allowance for office areas fitments	m²	4,682	400	1,872,800
191	Allowance for wet areas fitments	m²	238	800	190,400
192	Allowance for BOH areas fitments	m²	1,520	50	76,000
	METALWORK			***$332/m²***	***$2,139,200***
	FITMENTS			***$332/m²***	***$2,139,200***
HS	**HYDRAULIC SERVICES**				
HY	**HYDRAULICS**				
222	Allowance for hydraulic services to office areas	m²	4,682	121	561,900
223	Allowance for hydraulic services to BOH areas	m²	1,520	60	91,200
224	Allowance for hydraulic services to wet areas	m²	238	700	166,600
	HYDRAULICS			***$127/m²***	***$819,700***
	HYDRAULIC SERVICES			***$127/m²***	***$819,700***
MS	**MECHANICAL SERVICES**				
ME	**MECHANICAL INSTALLATIONS**				
225	Allowance for mechanical services to office areas	m²	4,682	371	1,732,400
226	Allowance for mechanical services to BOH areas	m²	1,520	100	152,000
227	Allowance for mechanical services to wet areas	m²	238	200	47,600
	MECHANICAL INSTALLATIONS			***$300/m²***	***$1,932,000***
	MECHANICAL SERVICES			***$300/m²***	***$1,932,000***
FP	**FIRE PROTECTION**				
FS	**FIRE SERVICES**				
228	Allowance for fire services to office areas	m²	4,682	91	421,400
229	Allowance for fire services to BOH areas	m²	1,520	90	136,800
230	Allowance for fire services to wet areas	m²	238	91	21,500
	FIRE SERVICES			***$90/m²***	***$579,700***
	FIRE PROTECTION			***$90/m²***	***$579,700***
LP	**ELECTRIC LIGHT AND POWER**				
EL	**ELECTRICAL INSTALLATIONS**				
219	Allowance for electrical services to office areas	m²	4,682	330	1,545,000
220	Allowance for electrical services to BOH areas	m²	1,520	220	334,400

Project Green Waratah

Indicative Order of Cost Budget Estimate July 2020

Location Element/Trade/Main heading/Sub heading Item

FB FACILITY BUILDINGS
OA Operations Admin (continued)

GFA: 6,438 m² Cost/m²: $3,295
Rates Current At June 2020

Description		Unit	Qty	Rate	Total
221	Allowance for electrical services to wet areas	m²	238	280	66,600
	ELECTRICAL INSTALLATIONS			***\$302/m²***	***\$1,946,000***
	ELECTRIC LIGHT AND POWER			***\$302/m²***	***\$1,946,000***
TS	**TRANSPORTATION SYSTEMS**				
LI	**LIFT INSTALLATIONS**				
167	Allowance for good and access lift to Main Facility (servicing 4 levels)	No	3	300,000	900,000
	LIFT INSTALLATIONS			***\$140/m²***	***\$900,000***
	TRANSPORTATION SYSTEMS			***\$140/m²***	***\$900,000***
	OPERATIONS ADMIN			***\$3,295/m²***	***\$21,210,600***

Project Green Waratah

Indicative Order of Cost Budget Estimate July 2020

Location Element/Trade/Main heading/Sub heading Item

FB FACILITY BUILDINGS

S Stack

Rates Current At June 2020

Description		Unit	Qty	Rate	Total
SB	**SUBSTRUCTURE**				
PI_P	**PILING**				
171	Piles supporting Stack, assume 17m deep (assume 1200mm dia, N40, 120kg/m3 reo)	m	340	1,000	340,000
	PILING				***$340,000***
CN_C	**CONCRETE - CONCRETE ITEMS**				
1	200mm thick RC slab on ground	m²	347	180	62,500
5	3000mm thick RC piled raft slab on ground (assume N40, 160kg/m3 reo)	m²	97	3,490	338,500
	CONCRETE - CONCRETE ITEMS				***$401,000***
	SUBSTRUCTURE				***$741,000***
EW	**EXTERNAL WALLS**				
CN_P	**CONCRETE - PRECAST**				
156	Allowance for precast stack (footing msd sep)	Item			800,000
	CONCRETE - PRECAST				***$800,000***
FC	**FACADES**				
120	Solid monolithic blades infill, brick cladded facade incl sub-frame / secondary steel	m²	128	800	102,400
129	Solid monolithic blades, brick cladded banding panels incl sub-frame / secondary steel	m²	541	851	459,900
	FACADES				***$562,300***
	EXTERNAL WALLS				***$1,362,300***
FT	**FITMENTS**				
MW	**METALWORK**				
173	Allowance for access fitments for Stack	Item			80,000
	METALWORK				***$80,000***
	FITMENTS				***$80,000***
	STACK				***$2,183,300***

FB FACILITY BUILDINGS
VC Visitor Centre

GFA: 648 m² Cost/m²: $6,315
Rates Current At June 2020

Description		Unit	Qty	Rate	Total
SB	**SUBSTRUCTURE**				
CN_C	**CONCRETE - CONCRETE ITEMS**				
132	Allowance for strip footing for rammed earth feature wall	m	125	751	93,800
202	150mm thick RC slab on ground incl foundations	m²	648	150	97,200
	CONCRETE - CONCRETE ITEMS			***$295/m²***	***$191,000***
	SUBSTRUCTURE			***$295/m²***	***$191,000***
CL	**COLUMNS**				
CR	**CARPENTRY**				
203	Columns, exposed CLT	m²	1,126	100	112,600
	CARPENTRY			***$174/m²***	***$112,600***
	COLUMNS			***$174/m²***	***$112,600***
SC	**STAIRCASES**				
CN_C	**CONCRETE - CONCRETE ITEMS**				
178	Allowance for fire stairs	M/R	5	2,600	13,000
	CONCRETE - CONCRETE ITEMS			***$20/m²***	***$13,000***
	STAIRCASES			***$20/m²***	***$13,000***
RF	**ROOF**				
CR	**CARPENTRY**				
204	CLT roof frame and canopy incl supply, wastage and installation	m²	1,126	750	844,500
215	Extra over CLT roof frame and canopy for visual grade finish incl wastage	m²	1,126	76	84,500
	CARPENTRY			***$1,434/m²***	***$929,000***
RF	**ROOFING**				
109	Allowance for roof safety system	Item			15,000
214	Allowance for green roof incl structural lining, membrane, planting medium, seed and drainage	m²	648	411	265,700
	ROOFING			***$433/m²***	***$280,700***
	ROOF			***$1,867/m²***	***$1,209,700***
EW	**EXTERNAL WALLS**				
MA	**MASONRY**				
123	Rammed earth feature wall (footing msd sep)	m²	697	551	383,400
	MASONRY			***$592/m²***	***$383,400***
FC	**FACADES**				
216	Fixed double glazed facade to Visitor Centre	m²	437	1,300	568,100
217	Extra over glazed facade for double door	No	2	5,000	10,000
	FACADES			***$892/m²***	***$578,100***
	EXTERNAL WALLS			***$1,484/m²***	***$961,500***

FB FACILITY BUILDINGS
VC Visitor Centre (continued)

GFA: 648 m² Cost/m²: $6,315
Rates Current At June 2020

Description		Unit	Qty	Rate	Total
NW	**INTERNAL WALLS**				
CN_P	**CONCRETE - PRECAST**				
7	250mm thick precast RC core walls	m²	125	421	52,500
	CONCRETE - PRECAST			***$81/m²***	***$52,500***
CR	**CARPENTRY**				
205	CLT walls incl supply, wastage and installation	m²	271	500	135,500
206	Extra over CLT walls for visual grade finish incl wastage	m²	541	76	40,600
	CARPENTRY			***$272/m²***	***$176,100***
	INTERNAL WALLS			***$353/m²***	***$228,600***
ND	**INTERNAL DOORS**				
DO	**DOORS**				
209	Single fire rated door complete	No	7	1,800	12,600
	DOORS			***$19/m²***	***$12,600***
	INTERNAL DOORS			***$19/m²***	***$12,600***
FF	**FLOOR FINISHES**				
CN_C	**CONCRETE - CONCRETE ITEMS**				
218	Allowance for floor finishes to Visitor Centre	m²	612	100	61,200
	CONCRETE - CONCRETE ITEMS			***$94/m²***	***$61,200***
TL	**TILING**				
183	Allowance for floor finishes to wet areas	m²	37	220	8,100
	TILING			***$12/m²***	***$8,100***
	FLOOR FINISHES			***$107/m²***	***$69,300***
FT	**FITMENTS**				
MW	**METALWORK**				
190	Allowance for office areas fitments	m²	612	400	244,800
191	Allowance for wet areas fitments	m²	37	800	29,600
	METALWORK			***$423/m²***	***$274,400***
	FITMENTS			***$423/m²***	***$274,400***
HS	**HYDRAULIC SERVICES**				
HY	**HYDRAULICS**				
222	Allowance for hydraulic services to office areas	m²	612	121	73,400
224	Allowance for hydraulic services to wet areas	m²	37	700	25,900
	HYDRAULICS			***$153/m²***	***$99,300***
	HYDRAULIC SERVICES			***$153/m²***	***$99,300***
MS	**MECHANICAL SERVICES**				
ME	**MECHANICAL INSTALLATIONS**				
225	Allowance for mechanical services to office areas	m²	612	371	226,400
227	Allowance for mechanical services to wet areas	m²	37	200	7,400
	MECHANICAL INSTALLATIONS			***$361/m²***	***$233,800***
	MECHANICAL SERVICES			***$361/m²***	***$233,800***

Project Green Waratah

Indicative Order of Cost Budget Estimate July 2020

Location Element/Trade/Main heading/Sub heading Item

FB FACILITY BUILDINGS
VC Visitor Centre (continued)

GFA: 648 m² Cost/m²: $6,315
Rates Current At June 2020

Description	Unit	Qty	Rate	Total
FP FIRE PROTECTION				
FS FIRE SERVICES				
228 Allowance for fire services to office areas	m²	612	91	55,100
230 Allowance for fire services to wet areas	m²	37	91	3,300
FIRE SERVICES			***$90/m²***	***$58,400***
FIRE PROTECTION			***$90/m²***	***$58,400***
LP ELECTRIC LIGHT AND POWER				
EL ELECTRICAL INSTALLATIONS				
219 Allowance for electrical services to office areas	m²	612	330	202,000
221 Allowance for electrical services to wet areas	m²	37	280	10,400
ELECTRICAL INSTALLATIONS			***$328/m²***	***$212,400***
ELECTRIC LIGHT AND POWER			***$328/m²***	***$212,400***
XR ROADS, FOOTPATHS AND PAVED AREAS				
EX EXTERIOR ELEMENTS				
231 Paving to Visitor Centre incl base slab	m²	1,299	321	415,700
EXTERIOR ELEMENTS			***$642/m²***	***$415,700***
ROADS, FOOTPATHS AND PAVED AREAS			***$642/m²***	***$415,700***
VISITOR CENTRE			***$6,315/m²***	***$4,092,300***

Project Green Waratah

Indicative Order of Cost Budget Estimate July 2020

Location Element/Trade/Main heading/Sub heading Item

FB FACILITY BUILDINGS
ACC ACC Building

GFA: 1,687 m² Cost/m²: $3,863
Rates Current At June 2020

Description		Unit	Qty	Rate	Total
SB	**SUBSTRUCTURE**				
CN_C	**CONCRETE - CONCRETE ITEMS**				
103	Allowance for foundations at ground level to ACC Building (area msd)	m²	1,687	300	506,100
	CONCRETE - CONCRETE ITEMS			***$300/m²***	***$506,100***
	SUBSTRUCTURE			***$300/m²***	***$506,100***
CL	**COLUMNS**				
SS	**STRUCTURAL STEEL**				
104	Allowance for primary supporting columns for ACC Building (area msd)	m²	1,687	200	337,400
119	Allowance for columns (no spec - area msd)	m²	1,687	51	84,400
	STRUCTURAL STEEL			***$250/m²***	***$421,800***
	COLUMNS			***$250/m²***	***$421,800***
UF	**UPPER FLOORS**				
CN_C	**CONCRETE - CONCRETE ITEMS**				
108	Allowance for suspended slab with integrated large fans	m²	1,687	451	759,200
	CONCRETE - CONCRETE ITEMS			***$450/m²***	***$759,200***
SS	**STRUCTURAL STEEL**				
107	Allowance for primary support beams for ACC Building suspended slabs	m²	1,687	200	337,400
	STRUCTURAL STEEL			***$200/m²***	***$337,400***
	UPPER FLOORS			***$650/m²***	***$1,096,600***
SC	**STAIRCASES**				
MW	**METALWORK**				
105	Allowance for access stairs to ACC Building	M/R	12	6,500	78,000
	METALWORK			***$46/m²***	***$78,000***
	STAIRCASES			***$46/m²***	***$78,000***
RF	**ROOF**				
SS	**STRUCTURAL STEEL**				
152	Allowance for purlins for lightweight roofs	m	1,197	45	53,900
154	Allowance for structural roof frame (allowed 30kg/m2)	t	50.68	7,500	380,100
	STRUCTURAL STEEL			***$257/m²***	***$434,000***
RF	**ROOFING**				
109	Allowance for roof safety system	Item			30,000
130	Lightweight roof, incl sheet metal roofing, insulation, safety mesh, trims and drainage	m²	1,690	151	253,500
	ROOFING			***$168/m²***	***$283,500***
	ROOF			***$425/m²***	***$717,500***

FB FACILITY BUILDINGS
ACC ACC Building (continued)

GFA: 1,687 m² Cost/m²: $3,863
Rates Current At June 2020

Description	Unit	Qty	Rate	Total
EW EXTERNAL WALLS				
FC FACADES				
124 Matt finish metal panel cladding incl sub-frame	m²	2,940	500	1,470,000
FACADES			***$871/m²***	***$1,470,000***
EXTERNAL WALLS			***$871/m²***	***$1,470,000***
WF WALL FINISHES				
FI FINISHES				
112 Allowance for internal wall finishes to ACC Building	m²	1,687		Excl.
FINISHES				***Excl.***
WALL FINISHES				***Excl.***
FF FLOOR FINISHES				
FI FINISHES				
110 Allowance for internal floor finishes to ACC Building	m²	1,687	20	33,700
FINISHES			***$20/m²***	***$33,700***
FLOOR FINISHES			***$20/m²***	***$33,700***
CF CEILING FINISHES				
FI FINISHES				
111 Allowance for internal ceiling finishes to ACC Building	m²	1,687		Excl.
FINISHES				***Excl.***
CEILING FINISHES				***Excl.***
FT FITMENTS				
MW METALWORK				
113 Allowance for internal fitments to ACC Building incl all metalwork and signage	m²	1,687	51	84,400
METALWORK			***$50/m²***	***$84,400***
FITMENTS			***$50/m²***	***$84,400***
HS HYDRAULIC SERVICES				
HY HYDRAULICS				
115 Allowance for hydraulic services to ACC Building	m²	1,687	111	185,600
HYDRAULICS			***$110/m²***	***$185,600***
HYDRAULIC SERVICES			***$110/m²***	***$185,600***
MS MECHANICAL SERVICES				
ME MECHANICAL INSTALLATIONS				
116 Allowance for mechanical services to ACC Building	m²	1,687	51	84,400
MECHANICAL INSTALLATIONS			***$50/m²***	***$84,400***
MECHANICAL SERVICES			***$50/m²***	***$84,400***

FB FACILITY BUILDINGS
ACC ACC Building (continued)

GFA: 1,687 m² Cost/m²: $3,863
Rates Current At June 2020

Description	Unit	Qty	Rate	Total
FP FIRE PROTECTION				
FS FIRE SERVICES				
117 Allowance for fire services to ACC Building	m²	1,687	90	151,800
FIRE SERVICES			***$90/m²***	***$151,800***
FIRE PROTECTION			***$90/m²***	***$151,800***
LP ELECTRIC LIGHT AND POWER				
EL ELECTRICAL INSTALLATIONS				
114 Allowance for electrical services to ACC Building	m²	1,687	1,000	1,687,000
ELECTRICAL INSTALLATIONS			***$1,000/m²***	***$1,687,000***
ELECTRIC LIGHT AND POWER			***$1,000/m²***	***$1,687,000***
ACC BUILDING			***$3,863/m²***	***$6,516,900***

FB FACILITY BUILDINGS
SB Substation Building

GFA: 1,680 m² Cost/m²: $3,012
Rates Current At June 2020

Description		Unit	Qty	Rate	Total
SB	**SUBSTRUCTURE**				
CN_C	**CONCRETE - CONCRETE ITEMS**				
1	200mm thick RC slab on ground	m²	1,680	180	302,400
	CONCRETE - CONCRETE ITEMS			***$180/m²***	***$302,400***
	SUBSTRUCTURE			***$180/m²***	***$302,400***
RF	**ROOF**				
SS	**STRUCTURAL STEEL**				
154	Allowance for structural roof frame (allowed 30kg/m2)	t	50.40	7,500	378,000
	STRUCTURAL STEEL			***$225/m²***	***$378,000***
RF	**ROOFING**				
109	Allowance for roof safety system	Item			20,000
130	Lightweight roof, incl sheet metal roofing, insulation, safety mesh, trims and drainage	m²	1,680	151	252,000
	ROOFING			***$162/m²***	***$272,000***
	ROOF			***$387/m²***	***$650,000***
EW	**EXTERNAL WALLS**				
CN_P	**CONCRETE - PRECAST**				
102	External walls to Substation Building (assume precast concrete)	m²	743	400	297,200
	CONCRETE - PRECAST			***$177/m²***	***$297,200***
	EXTERNAL WALLS			***$177/m²***	***$297,200***
ED	**EXTERNAL DOORS**				
DO	**DOORS**				
208	Single fire rated door complete	No	4	1,800	7,200
210	Allowance for large automatic overhead door	No	2	20,000	40,000
	DOORS			***$28/m²***	***$47,200***
	EXTERNAL DOORS			***$28/m²***	***$47,200***
WF	**WALL FINISHES**				
FI	**FINISHES**				
194	Allowance for internal wall finishes to Substation Building	m²	1,680		Excl.
	FINISHES				***Excl.***
	WALL FINISHES				***Excl.***
FF	**FLOOR FINISHES**				
FI	**FINISHES**				
195	Allowance for internal floor finishes to Substation Building	m²	1,680	20	33,600
	FINISHES			***$20/m²***	***$33,600***
	FLOOR FINISHES			***$20/m²***	***$33,600***

Description		Unit	Qty	Rate	Total
CF	**CEILING FINISHES**				
FI	**FINISHES**				
196	Allowance for internal ceiling finishes to Substation Building	m²	1,680		Excl.
	FINISHES				***Excl.***
	CEILING FINISHES				***Excl.***
FT	**FITMENTS**				
MW	**METALWORK**				
197	Allowance for internal fitments to Substation Building incl all metalwork and signage	m²	1,680	50	84,000
	METALWORK			***$50/m²***	***$84,000***
	FITMENTS			***$50/m²***	***$84,000***
HS	**HYDRAULIC SERVICES**				
HY	**HYDRAULICS**				
198	Allowance for hydraulic services to Substation Building	m²	1,680	60	100,800
	HYDRAULICS			***$60/m²***	***$100,800***
	HYDRAULIC SERVICES			***$60/m²***	***$100,800***
MS	**MECHANICAL SERVICES**				
ME	**MECHANICAL INSTALLATIONS**				
199	Allowance for mechanical services to Substation Building	m²	1,680	50	84,000
	MECHANICAL INSTALLATIONS			***$50/m²***	***$84,000***
	MECHANICAL SERVICES			***$50/m²***	***$84,000***
FP	**FIRE PROTECTION**				
FS	**FIRE SERVICES**				
200	Allowance for fire services to Substation Building	m²	1,680	60	100,800
	FIRE SERVICES			***$60/m²***	***$100,800***
	FIRE PROTECTION			***$60/m²***	***$100,800***
LP	**ELECTRIC LIGHT AND POWER**				
EL	**ELECTRICAL INSTALLATIONS**				
201	Allowance for electrical services to Substation Building	m²	1,680	2,000	3,360,000
	ELECTRICAL INSTALLATIONS			***$2,000/m²***	***$3,360,000***
	ELECTRIC LIGHT AND POWER			***$2,000/m²***	***$3,360,000***
	SUBSTATION BUILDING			***$3,012/m²***	***$5,060,000***

EA EXTERNAL AREAS

HS Hardstands and Parking

Rates Current At June 2020

Description		Unit	Qty	Rate	Total
XR	**ROADS, FOOTPATHS AND PAVED AREAS**				
CN_C	**CONCRETE - CONCRETE ITEMS**				
60	Allowance for reinforced concrete hardstand/medians surrounding pavement; assume 200mm thick	m^2	2,773	121	332,800
61	Allowance for Concrete pavement for main entrance and around EfW facility; inclusive of 300mm thick SMZ layer, 200mm DGB20, and 220mm 32mpa dowelled jointed reinforced concrete pavement- SL82 mesh	m^2	16,238	140	2,273,300
62	Allowance for extra over concrete slab thickening to support chimney stack and diesel tanks; assume 300mm	m^2	963	200	192,600
63	Allowance for Asphalt pavement for access road to visitor centre and car park; inclusive of 300mm SMZ layer, 7mm Low cutter seal, 150mm AC20 C450 and 50mm AC10 A15E	m^2	2,058	156	319,000
	CONCRETE - CONCRETE ITEMS				***$3,117,700***
	ROADS, FOOTPATHS AND PAVED AREAS				***$3,117,700***
	HARDSTANDS AND PARKING				***$3,117,700***

EA EXTERNAL AREAS
RB Bio-Retention Basin

Rates Current At June 2020

Description		Unit	Qty	Rate	Total
XP	**SITE PREPARATION**				
GW	**GROUND WORKS**				
81	Allowance for detailed excavation of 1000mm depth to base of basin	m²	906	150	135,900
	GROUND WORKS				***$135,900***
	SITE PREPARATION				***$135,900***
XL	**LANDSCAPING AND IMPROVEMENTS**				
EX	**EXTERIOR ELEMENTS**				
83	Allowance for 500mm thick media filter layer	m²	641	51	32,100
84	Allowance for nutrient removing planting to BCC standards	m²	641	25	16,000
	EXTERIOR ELEMENTS				***$48,100***
	LANDSCAPING AND IMPROVEMENTS				***$48,100***
	BIO-RETENTION BASIN				***$184,000***

Project Green Waratah

Indicative Order of Cost Budget Estimate July 2020

Location Element/Trade/Main heading/Sub heading Item

EA EXTERNAL AREAS

DB Detention Basin

Rates Current At June 2020

Description		Unit	Qty	Rate	Total
XP	**SITE PREPARATION**				
GW	**GROUND WORKS**				
85	Allowance for detailed excavation; 1900mm depth to base of basin	m²	2,005	280	561,400
	GROUND WORKS				***$561,400***
DR	**DRAINAGE**				
86	Allowance for Basin outlet structure	No	1	25,000	25,000
	DRAINAGE				***$25,000***
	SITE PREPARATION				***$586,400***
XL	**LANDSCAPING AND IMPROVEMENTS**				
EX	**EXTERIOR ELEMENTS**				
233	Allowsnce for Rip rap to outlet	m²	50	150	7,500
	EXTERIOR ELEMENTS				***$7,500***
	LANDSCAPING AND IMPROVEMENTS				***$7,500***
	DETENTION BASIN				***$593,900***

Project Green Waratah

Indicative Order of Cost Budget Estimate July 2020

Location Element/Trade/Main heading/Sub heading Item

EA EXTERNAL AREAS

L Landscaping

Rates Current At June 2020

Description		Unit	Qty	Rate	Total
SB	**SUBSTRUCTURE**				
PI_P	**PILING**				
34	Soldier pile retaining wall [RW01]	m²	3,635	2,500	9,087,500
35	Soldier pile retaining wall [RW04]	m²	184	2,500	460,000
38	Soldier pile retaining wall [RW06]	m²	224	2,500	560,000
207	Soldier pile retaining wall [RW02]	m²	404	2,500	1,010,000
211	Soldier pile retaining wall [RW03]	m²	63	2,500	157,500
212	Soldier pile retaining wall [RW05]	m²	70	2,500	175,000
213	Soldier pile retaining wall [RW07]	m²	128	2,500	320,000
	PILING				***$11,770,000***
	SUBSTRUCTURE				***$11,770,000***
XL	**LANDSCAPING AND IMPROVEMENTS**				
EX	**EXTERIOR ELEMENTS**				
72	Allowance for New1.8m high ATF perimeter fence with Shade Cloth	m	1,000	95	95,000
73	Allowance for linemarking to carpark	Item			20,000
74	Supply and install new rubber car stops to new carpark	No	67	1,000	67,000
76	Allowance for Landscaping	m²	15,103	100	1,510,300
	EXTERIOR ELEMENTS				***$1,692,300***
	LANDSCAPING AND IMPROVEMENTS				***$1,692,300***
	LANDSCAPING				***$13,462,300***

Project Green Waratah

Indicative Order of Cost Budget Estimate July 2020

Location Element/Trade/Main heading/Sub heading Item

EA EXTERNAL AREAS

SQ Special Equipment

Rates Current At June 2020

Description		Unit	Qty	Rate	Total
SE	**SPECIAL EQUIPMENT**				
EX	**EXTERIOR ELEMENTS**				
77	Supply and install new weighbridges for incoming and outgoing trucks	No	5	250,000	1,250,000
	EXTERIOR ELEMENTS				***$1,250,000***
	SPECIAL EQUIPMENT				***$1,250,000***
XB	**OUTBUILDINGS AND COVERED WAYS**				
EX	**EXTERIOR ELEMENTS**				
80	Allowance for kiosks to incoming and outgoing truck stops	No	2	100,000	200,000
	EXTERIOR ELEMENTS				***$200,000***
	OUTBUILDINGS AND COVERED WAYS				***$200,000***
XS	**EXTERNAL SPECIAL SERVICES**				
EX	**EXTERIOR ELEMENTS**				
78	Allowance for 2 x Diesel Gas tanks to sit above ground on concrete hardstand	Item			200,000
79	Allowance for new pumpstation; assume 3 dispensers	Item			500,000
	EXTERIOR ELEMENTS				***$700,000***
	EXTERNAL SPECIAL SERVICES				***$700,000***
	SPECIAL EQUIPMENT				***$2,150,000***

Project Green Waratah

Indicative Order of Cost Budget Estimate July 2020

Location Element/Trade/Main heading/Sub heading Item

EA EXTERNAL AREAS

SW Stormwater Drainage

Rates Current At June 2020

Description		Unit	Qty	Rate	Total
BW	**BUILDERS WORK IN CONNECTION WITH SERVICES**				
DR	**DRAINAGE**				
193	Allowance to connect into stormwater mains	Item			25,000
	DRAINAGE				***$25,000***
	BUILDERS WORK IN CONNECTION WITH SERVICES				***$25,000***
XK	**EXTERNAL STORMWATER DRAINAGE**				
DR	**DRAINAGE**				
92	375mm Reinforced Concrete Pipe Class 4 RRJ, including excavation and backfilling material	m	37	325	12,000
93	450mm Reinforced Concrete Pipe Class 4 RRJ, including excavation and backfilling material	m	55	342	18,800
94	525mm Reinforced Concrete Pipe Class 4 RRJ, including excavation and backfilling material	m	197	412	81,000
95	600mm Reinforced Concrete Pipe Class 4 RRJ, including excavation and backfilling material	m	40	448	17,900
96	675mm Reinforced Concrete Pipe Class 4 RRJ, including excavation and backfilling material	m	189	500	94,500
97	750mm Reinforced Concrete Pipe Class 4 RRJ, including excavation and backfilling material	m	46	529	24,300
98	900mm Reinforced Concrete Pipe Class 4 RRJ, including excavation and backfilling material	m	21	596	12,500
100	Grated kerb inlet pit, including excavation and backfilling material	No	42	5,000	210,000
101	Gross pollutant trap	No	2	100,000	200,000
	DRAINAGE				***$671,000***
	EXTERNAL STORMWATER DRAINAGE				***$671,000***
	STORMWATER DRAINAGE				***$696,000***

Appendix E

Landowners consent

11 June 2020

Landowners consent for development of Western Sydney Energy and Resource Recovery Centre at 339 Wallgrove Road, Eastern Creek

Attn: Department of Planning, Industry and Environment

Western Sydney Resource Recovery Centre Pty Ltd in its capacity as trustee of the Green Waratah Project Trust of Level 26, 181 William Street, Melbourne, Victoria is the legal owner of the property at 339 Wallgrove Road, Eastern Creek, NSW 2766 [also known as Lot 1 in DP 1059698].

Western Sydney Resource Recovery Centre Pty Ltd in its capacity as trustee of the Green Waratah Project Trust of Level 26, 181 William Street, Melbourne, Victoria gives consent to Cleanaway Operations Pty Ltd to submit an application for development consent for the Western Sydney Energy and Resource Recovery Centre (SSD 10395) under Part 4 of the *Environmental Planning & Assessment Act 1979*.

Signed by the Authorised representative of the Landowner:

Executed in accordance with section 127 of the *Corporations Act 2001* by Western Sydney Resource Recovery Centre Pty Ltd in its capacity as trustee of the Green Waratah Project Trust

Vik Bansal

Director Signature

Vik Bansal

Print Name

Chris Voyce

Director Signature

Christopher Voyce

Print Name

B Gill

Director/Secretary Signature

Brendan Gill

Print Name

Nicholas Entsch

Director/Secretary Signature

Nicholas Entsch

Print Name

Appendix F

Community and stakeholder engagement report

NEWGATE
ENGAGE

ENVIRONMENTAL IMPACT STATEMENT

WESTERN SYDNEY ENERGY & RESOURCE RECOVERY CENTRE

Appendix F: Community and Stakeholder Engagement Report

September 2020

DOCUMENT CONTROL

Review:	EME Advisory – Brian Cullinane, Director	23/04/2020
Review: ARUP and Legal Review	Ashurst Review	4/06/2020
Review:	Newgate Engage – Fiona Court, Partner & Director	2/9/2020

DECLARATION

Newgate Engage (the author of this Community and Stakeholder Engagement Report, which will form part of the Western Sydney Energy & Resource Recovery Centre's Environmental Impact Statement) hereby declares that this Report has been prepared on behalf of the project (Cleanaway and Macquarie Capital) in accordance with the *Environmental Planning and Assessment Regulation 2000* and the Secretary's Environmental Assessment Requirements for the proposal. The Report contains all information relevant to the community and stakeholder engagement assessment for the proposal, and the information included in this report is not false or misleading.

GLOSSARY

Project – a group proposing the WSERRC, consisting of Cleanaway and Macquarie Capital

DPIE – Department of Planning, Industry & Environment in NSW

EIS – Environmental Impact Statement

EfW – Energy-from-waste

LGA – Local government areas

SEARs – Secretary's Environmental Assessment Requirements

IAP2 – International Association of Public Participation

WSERRC – Western Sydney Energy and Resource Recovery Centre

EXECUTIVE SUMMARY

Cleanaway and Macquarie Capital are jointly developing an energy-from-waste (EfW) facility known as the Western Sydney Energy and Resource Recovery Centre (WSERRC) (the proposal). This report describes the communications and the community and stakeholder engagement that accompanied the development and assessment of the proposal.

This report demonstrates how the activities undertaken have met the Secretary's Environmental Assessment Requirements (SEARs) issued on 12 December 2019. The SEARs identify the requirements to be addressed in the Environmental Impact Statement (EIS), including those related to community and stakeholder engagement.

A communications and engagement journey was mapped at the commencement of the process that described our understanding of the community perspective, and subsequently our communication and engagement goals.

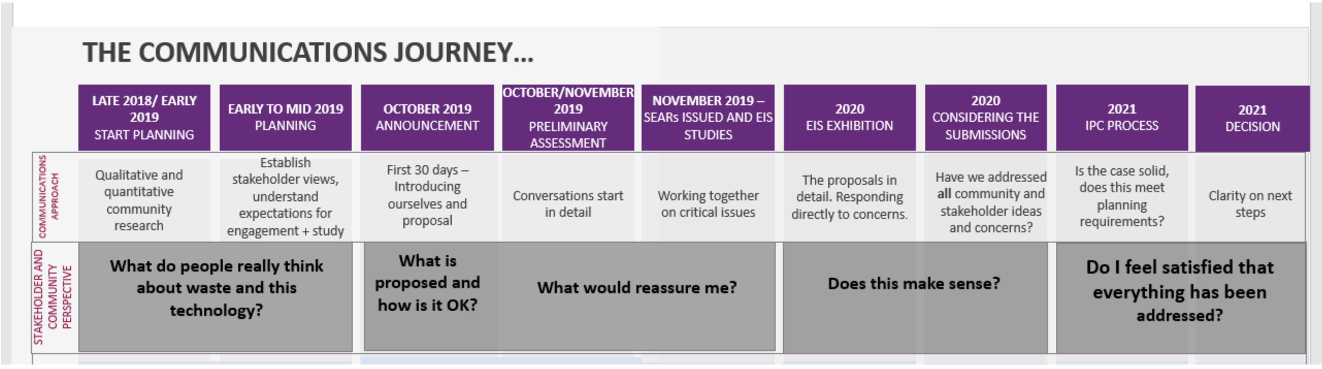


Figure 1 – Topline summary of the proposal's communications journey

The International Association of Public Participation (IAP2) community engagement framework was used in proposal planning and provided a recognised and robust framework for the engagement. Recognising the IAP2 core value of the community having a say in how they are consulted, the community was asked about their preferences for community engagement tools and issues in several different forums.

Understanding early issues from community research and a start-up community workshop, the project's communications and engagement activity had the goal of demonstrating that the proposal:

- meets a need and is in the public interest;
- is supported by a government policy framework;
- is sited in an area that makes practical sense (e.g. accessible, an industrial area, acceptable volume of traffic, an appropriate and safe use of land);
- has adopted a legitimate community engagement process, following an established practice recommended by the International Association of Public Participation;
- has a community funding component;
- provides a community education function; and
- acknowledges community and stakeholder concerns and ideas.

The project's subsequent activities to build an understanding of the proposal and community and stakeholder relationships are described in this report. A positive start to relationships has commenced with interactive community and stakeholder discussions from October 2019 to April 2020, across a wide range of engagements including:

- government agency meetings (in 2019 and 2020);

- community research (in 2018 and 2019);
- a start-up community workshop (November 2019);
- door knocking and doorstop conversations (in 2019 and 2020);
- respectful and informative online conversations (in 2019 and 2020);
- information display pop-ups (in 2019 and 2020);
- the Air and Health Citizens' Panel (in 2020).

[To Cleanaway] "Show us this is a different type of facility. Make sure there are benefits. Make sure it's not going to hurt us. This must be a benefit to the community."
- **Dr Hugh McDermott MP, Community workshop 9 November 2019**

[To the community]; "Please be frank, be honest, put a question to them – even the hard ones!" - **Dr Hugh McDermott MP, Community workshop 9 November 2019**

The engagement activities met the following objectives.

Information - Provide information about the Western Sydney Energy and Resource Recovery Centre (WSERRC) that is comprehensive, accessible and trustworthy

Feedback – Actively seek and respond to community and stakeholder views

EIS process - Clearly explain the EIS process and opportunities for community and stakeholder engagement throughout the process

Two-way consultation - Exchange detailed information from technical investigations through discussions with community and stakeholders

There has been a large-scale investment in community and stakeholder conversations.

- Approximately 46 meetings or detailed exchange of correspondence with government agencies; 20 with other groups; and 14 with businesses and business groups have been held.
- Approximately 237 person hours undertook the door knocking to over 3000 homes, some 100 proposal team hours working with the Air and Health Citizens' Panel participants; and 135 person hours of conversation at local pop-up information stands.
- Responding to community questions, rather than waiting until the EIS was published, was considered to be important by the project. Over 350 individual, written responses have been provided to community members with the information already obtained by the project.

The project's view is that their relationships with the western Sydney community and stakeholders, including government agencies, residents, the business community and other stakeholder groups are building, as issues are responded to and questions are answered.

There is a commitment to continue this journey as mapped, to assist in the building of understanding and relationships. For the next phase of EIS Exhibition, engagement activities will be focussed on the question *Does this make sense?* This report describes the engagement activities to be undertaken during the EIS Exhibition, and then should the proposal be approved, the project's commitment to ongoing community and stakeholder engagement.

I wish you all the best of luck as I've said, I've gone from being extremely against it to believing it's a good thing.

- Air and Health and Citizens' Panel member

1. INTRODUCTION

Cleanaway and Macquarie Capital are jointly developing an energy-from-waste (EfW) facility known as the Western Sydney Energy and Resource Recovery Centre (WSERRC) (the proposal).

The proposal will be designed to thermally treat up to 500,000 tonnes per year of residual Municipal Solid Waste (MSW) and residual Commercial and Industrial (C&I) waste streams that would otherwise be sent to landfill. This process would generate up to 58 megawatts (MW) of base load electricity some of which would be used to power the facility itself with the remaining 55MW exported to the grid. The proposal involves the building of all onsite infrastructure needed to support the facility including site utilities, internal roads, weighbridges, parking and hardstand areas, storm water infrastructure, fencing and landscaping.

The proposal site is located at 339 Wallgrove Road in Eastern Creek, NSW (Lot 1 DP 1059698) which is in the Blacktown local government area (LGA). The site is in the Wallgrove Precinct of the Western Sydney Parklands (WSP) Plan of Management.

The 8.23ha site is divided by a small strip of land not part of the proposal site, resulting in a 2.04ha northern section and a 6.19ha southern section. This dividing strip is part of the adjacent lot and includes a right of carriageway benefitting the proposal site allowing vehicles to move between the two parts of the site. The proposal area will be fully contained in the 6.19ha portion of the site. Works to occur on the 2.04 ha northern section of the site include the clearing of weeds and exotic vegetation within the existing overland flow channel which is confined to the eastern section of this parcel of land. The northern section will also be used temporarily to support construction works. No other works will occur on the 2.04 ha northern section of the site as part of this proposal.

The existing site includes buildings associated with a disused poultry facility, which will be cleared from the site prior to starting construction.

The site is bounded by the M7 Motorway to the west with the Eastern Creek industrial area located farther west. The now-closed Eastern Creek landfill site (which still has an operational organics recycling facility component) is located to the north and north-east, with the operational Global Renewables waste management facility located immediately to the east. To the south, the site is bounded by the Warragamba Pipeline Corridor with the Austral Bricks facility located farther south.

The nearest residential area is located around 1 km to the south of the site. The Erskine Park residential area is located around 3.5 km to the west with Minchinbury located around 3 km to the north. Horsley Park Public School is located over 2 km south of the site and a childcare centre is located within the Eastern Creek industrial area approximately 1 km to the west of the site.

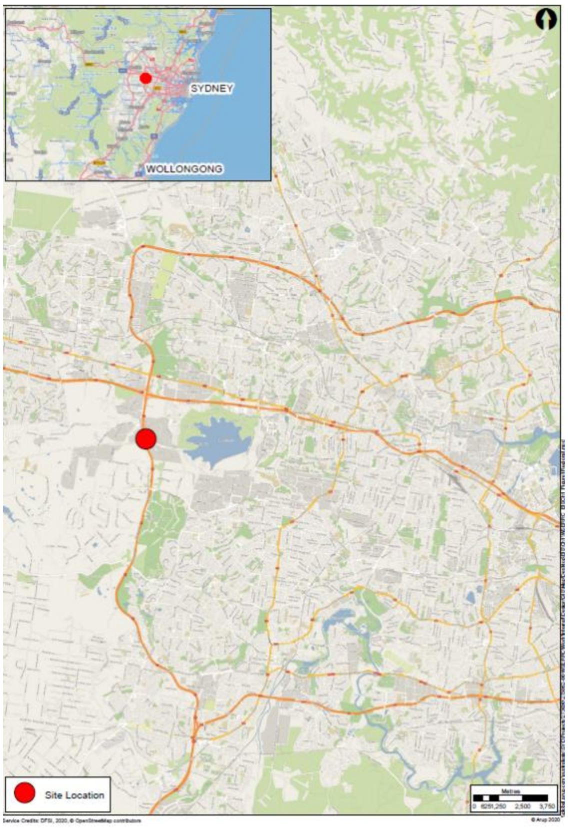


Figure 2 - Site locality relative to Sydney

Figure 3 – Site locality

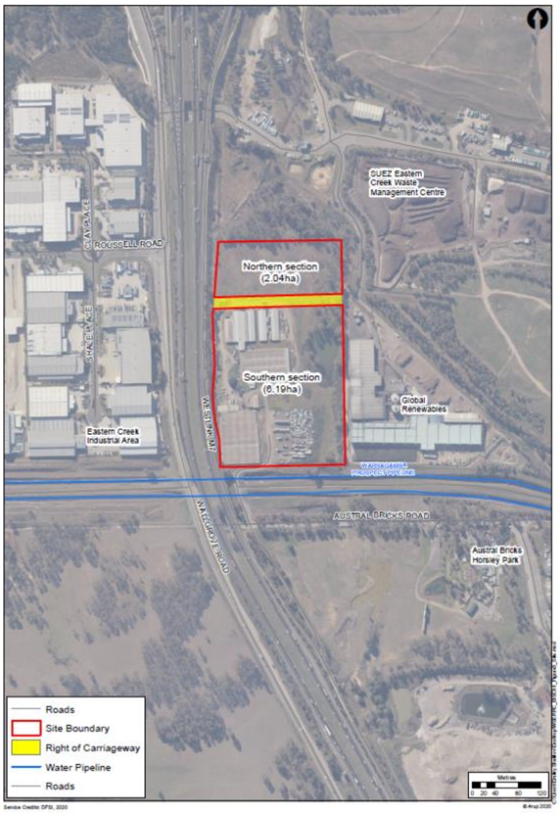


Figure 4 - The site area

2. ASSESSMENT REQUIREMENTS

2.1. SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS

The Department of Planning, Industry and Environment (DPIE) issued the Secretary's Environmental Assessment Requirements (SEARs) on 12 December 2019 in accordance with Schedule 2 of the *Environmental Planning and Assessment Regulation 2000*.

The SEARs identify the assessment requirements to be addressed in the Environmental Impact Statement (EIS), including those related to Community and Stakeholder Engagement, which is the purpose of this Community and Stakeholder Engagement Report.

The table below highlights the SEARs this Community and Engagement Stakeholder Report will address as part of the Western Sydney Energy and Resource Recovery Centre's (WSERRC) EIS.

RELEVANT SEARS REQUIREMENTS	SPECIFIC MATTERS	PROJECT'S RESPONSE
	Community and Stakeholder Engagement – including:	See Section 3
	• 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 justification for the approach	
	• A description of the form of engagement activities undertaken	See Section 3.4 See Section 3.5
	• A report on the results of the implementation of the strategy including issues raised by the community and the surrounding occupiers and landowners that may be impacted by the proposal	See Section 4
	• Details of how issues raised during community and stakeholder consultation have been addressed and whether they have resulted in changes to the proposal	See Section 5.3
	• Details of the proposed approach to future community and stakeholder engagement based on the results of the consultation	See Section 5.3
	• Details of how monitoring data will be communicated and made publicly accessible to the community	See Section 5.3
	• A commitment to the establishment of a Community Liaison Group comprised of key local stakeholders	See Section 5.3
Consultation	During the preparation of the EIS, you must consult with the relevant local, State or Commonwealth Government authorities, service providers, community groups and affected landowners. In particular you must consult with: • Blacktown City Council • Fairfield Council • Environment Protection Authority • Department of Primary Industries • Environment, Energy and Science (previously Office of Environment and Heritage)	See Section 3.5; 4.1

	• Transport for NSW (including Roads and Maritime Services) • NSW Ministry of Health • Western Sydney Local Health District • NSW Fire and Rescue • Department of Planning, Industry and Environment – Water and Natural Resources Access Regulator • Sydney Water • Endeavour Energy • SafeWork NSW • Western Sydney Airport Corporation • Civil Aviation Safety Authority • Department of Energy and Environment • Nearby landowners, businesses and occupiers that may be affected by the proposal 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.	
Blacktown Council Relevant SEARS	• The applicant should demonstrate a commitment to establish a Community Liaison Group of local Stakeholders, including nearby businesses, objectors and local residents, Council and the EPA	See Section 5.3
	• The applicant should demonstrate a commitment to offset some community concern by funding local community improvements and enhancement programs, which must be outlined in a Community Strategy and incorporate a visitor information and education centre	See Section 4.5.2
	• The applicant must demonstrate how they have obtained a social licence for the proposal	See Section 3.1.6; 4.4
	• The applicant should demonstrate a commitment to host regular community forums and hold an annual open day to allow residents to tour the facility	See Section 5.3
	• Demonstrate the community benefits of the facility, including details of similar facilities which are operating around the world including testimonies from their regulating offices and contact details.	See Section 4.5
Further consultation after 2 years	If you do not lodge a Development Application and EIS for the development within two years of the issue date of these SEARs, you must consult further with the Secretary in relation to the preparation of the EIS.	Noted.

Table 1 – Community and stakeholder engagement requirements for the WSERRC EIS, 2020

3. ENGAGEMENT

3.1. APPROACH TO COMMUNITY ENGAGEMENT

The approach to a community and engagement strategy was developed through:

- appreciating the EIS process and the iterative nature of the stakeholder and community engagement program;
- conducting community research in order to understand issues, ideas, sentiment and how the community wants to be engaged regarding any waste management proposal;
- an analysis and application of the IAP2 framework for community engagement;
- consideration of local community suggestions;
- developing clear objectives that underpin the community and stakeholder engagement strategy; and
- developing a communication and engagement journey map, highlighting our objectives in each phase of the proposal's development.

3.1.1 The EIS process

The program of engagement has several rounds; in which the project team returns to the community with further information as it becomes available; and in response to questions. This is described in the Figure 5.

Figure 5 – Typical community engagement process for a major proposal development

3.1.2 Community research

Newgate Research conducted community research to assist the project with understanding the community's knowledge, understanding of and sentiment towards the current waste management landscape (in particular, thoughts on possible energy-from-waste initiatives, and an energy-from-waste centre in Western Sydney) and how to best engage with the community during an EIS process.

Newgate Research is an accredited organisation in accordance with the international quality standard for market and social research (ISO 20252:2012).

The qualitative research was conducted in December 2018 and the quantitative research in January 2019. The research aimed to establish the following questions:

- knowledge and perceptions of waste management and recycling issues and management approaches;
- levels of support and opposition to energy-from-waste and the response to the prospect of a facility in a suburb near them;
- key drivers of opinion, misunderstandings, knowledge gaps, questions and concerns;
- messaging about energy-from-waste that is most effective in shifting sentiment;

- the reputational standing of organisations that could be involved in an energy-from-waste plant;
- trust in various sources of information, including experts such as CSIRO, NSW Chief Scientist, etc;
- expectations around engagement and consultation for this proposal; and
- key metrics by location and demographic segment, including identification of the profile of the target audience(s) for communications activities.

Qualitative research

Newgate conducted four 2-hour focus groups on 29 November 2019, two groups in each in Penrith and Prospect. This research was prior to the proposal location being selected; and they were seen a s a good indication of the region being considered. Participants were recruited to ensure a mix of gender; age and location of residence, as shown below.

A summary of the qualitative research can be found in *Appendix A.*

	Penrith	**Prospect**
Aged 18-40	10 participants	10 participants
Aged 40+	8 participants	8 participants
Suburbs represented	Cambridge Park, Cambridge Gardens, Colyton, Cranebrook, Kingswood, Lethbridge Park, Oxley Park, Penrith, Ropes Crossing, St Marys, Werrington, Whalan	Bossley Park, Cecil Hills, Erskine Park, Kemps Creek, Leppington, Middleton Grange, Smithfield, St Clair

Table 2 - Participant demographic information

Generally, the focus group conversations demonstrated the following.

- The level of awareness of waste management processes and issues is low: there is not as yet clear problem to solve.
- Initial responses to the idea of energy-from-waste are generally positive and there is interest in it as a solution, however, there were a lot of questions about potential impacts to the community.
- Community concerns about an energy-from-waste facility relate to this, but more so there are concerns that the facility could have serious health implications, cause traffic issues, and affect property values. There were concerns related to emissions, with smells and traffic implications following, potential to impact recycling habits, lack of trust in government, and potential increase in council rates.
- The benefits were seen as being related to land use, local jobs, energy production, use of energy-from-waste in other cities and countries, and existing issues with landfill.
- Seeing well-designed facilities in proximity to inhabited areas softened the assumption that these facilities will be dirty, polluting, and cause health risks. Demonstrating how overseas examples work will be important to the discussion.
- Trustworthy sources of information included communities living in proximity to energy-from-waste facilities, independent scientists (for example the CSIRO), international experts and those currently running similar facilities, and health experts (for example Department of Health, Westmead Hospital).

Some sample quotes follow.

> "On face value it's a great thing, but I don't trust the government" – Eastern Creek/Badgerys Creek

> "There's no need to put it in a metropolitan area" – Eastern Creek/Badgerys Creek

> "Our population is growing, we should look to other countries and see what they're doing" – Eastern Creek/Badgerys Creek

Figure 6 - Qualitative feedback

Quantitative research

In the quantitative research, a community sample of 2,285 respondents was representative of a cross-section of age and gender across three local government areas (LGA) and the Greater Sydney region. This research was prior to the proposal location being selected; and they were seen a s a good indication of the region being considered. This sample size included respondents from Blacktown, Liverpool and Penrith LGA. Respondents were screened to ensure they did not have an immediate connection to the waste management, energy, government (public policy or local government), media or journalism sectors. A summary of the Quantitative research can be found in *Appendix A.*

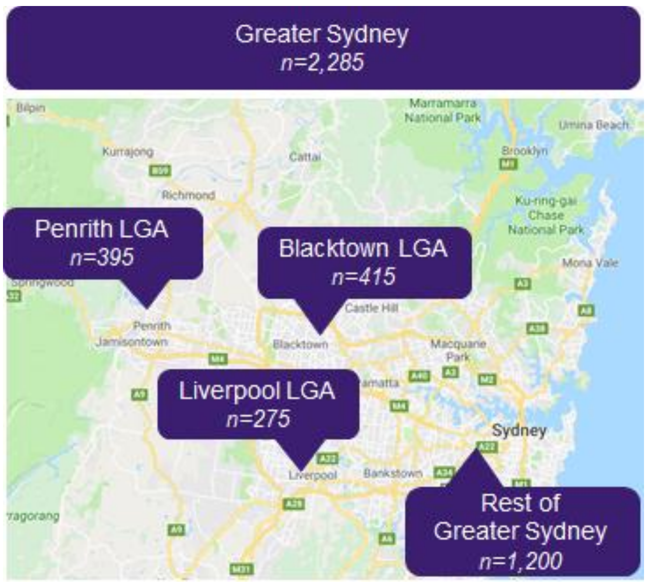


Figure 7 - Community research sample breakdown

Western Sydney and Waste

The quantitative research tested the sentiment and baseline knowledge of the participating community members. The research results provided information across six categories:

- care what happens to waste;
- know what happens to waste;
- residual waste management preference;
- perceptions of energy-from-waste;
- acceptability of an energy-from-waste facility in a nearby suburb; and
- their engagement preferences if a facility was being developed in their local area.

A summary of the findings across the categories for Blacktown LGA, Liverpool LGA, Penrith LGA and the Rest of Sydney follows.

		Greater Sydney	Blacktown LGA	Liverpool LGA	Penrith LGA	Rest of Sydney
Sample: n =		*2,285*	*415*	*275*	*395*	*1,200*
CARE WHAT HAPPENS TO WASTE	Care a lot / a bit	**90%**	88%	83%	90%	90%
	Don't care much / at all	**10%**	12%	17%	10%	10%
KNOW WHAT HAPPENS TO WASTE	Know a lot / a fair bit	**35%**	31%	26%	27%	36%
	Know little bit / nothing	**65%**	69%	74%	73%	64%
RESIDUAL WASTE MANAGEMENT **PREFERENCE** *(BASELINE SENTIMENT*)*	Energy from waste	**89%**	88%	92%	92%	88%
	Landfill	**11%**	12%	8%	8%	12%
PERCEPTIONS OF ENERGY FROM WASTE *(BASELINE SENTIMENT*)*	Positive (7+ out of 10)	**77%**	75%	73%	72%	78%
	Neutral (5-6 out of 10)	**14%**	14%	16%	16%	13%
	Negative (0-4 out of 10)	**4%**	6%	4%	5%	4%
ACCEPTABILITY OF ENERGY FROM WASTE FACILITY IN A **NEARBY SUBURB** *(BASELINE SENTIMENT*)*	Highly acceptable	**15%**	18%	11%	12%	16%
	Somewhat acceptable	**27%**	26%	27%	27%	27%
	Unsure	**31%**	35%	33%	31%	31%
	Somewhat unacceptable	**13%**	12%	16%	15%	13%
	Highly unacceptable	**14%**	9%	13%	14%	14%
ENGAGEMENT PREFERENCE IF A FACILITY WAS BEING DEVELOPED IN THEIR LOCAL AREA	Want to be consulted / more deeply involved	**29%**	25%	27%	24%	29%
	Want to be informed	**45%**	43%	44%	45%	46%
	Not sure / not interested	**26%**	32%	29%	31%	25%

NEWGATE RESEARCH

*After they read a brief description of Recycling, Advanced sorting, Energy from Waste and Landfill, but before they saw more detailed information on Energy from Waste

Significantly lower than other locations @ 95% confidence level

Significantly higher than other locations @ 95% confidence level

Table 3 - Differences in perceptions of waste management by location (Newgate Research, 2019)

Energy-from-waste (knowledge and sentiment)

Just over half of the total respondents (52%) said they were aware of and knew at least a little bit about energy-from-waste. Awareness was slightly lower than this score for both Liverpool and Penrith LGAs (42% and 45% respectively).

After respondents had been provided with brief facts about four waste management options, they felt most positively about recycling (85%) and energy-from-waste (77%), with 36% positive towards landfill. When asked to choose between energy-from-waste or landfill as a means of managing residual waste, respondents strongly preferred energy-from-waste (89%) over landfill (11%).

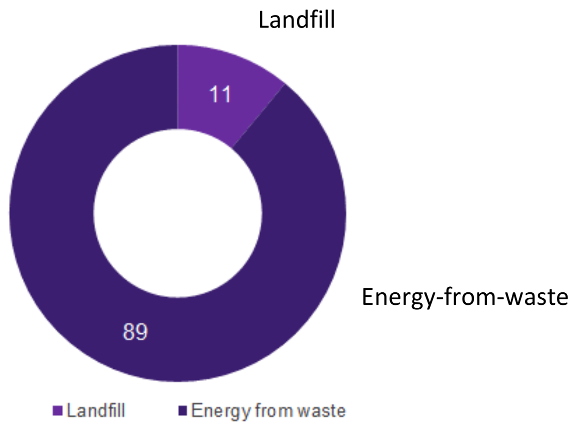


Figure 8 - Preferred way to manage residual waste (%)(Newgate Research 2019)

Those in support considered it a positive use of waste, a valuable new source of cheaper energy, and better for the environment than landfill.

Based on the brief information respondents were shown on waste management options, 70% said they would accept an energy-from-waste facility in NSW, 54% said they would accept one in the Greater Sydney area, and 42% said they would accept an energy-from-waste facility in industrial areas in a nearby suburb.

Perceived benefits

When the respondents were asked about potential community benefits, the strongest support was shown for:

- local employment opportunities.

Lesser support was also shown for:

- community investments that are funded through a dedicated proposal community fund;
- onsite educational and learning facilities useful for school and other tours;
- apprenticeships;
- educational training (STEM courses for high school); and
- co-located community facilities (such as recreational swimming facilities) that can utilise the heat and electricity.

Research conclusions

The research helped the proposal understand community perceptions of waste management and perceptions of energy-from-waste initiatives. The project considered how the community responded to messages about the proposal, and perceptions of the project's teams themselves.

The results provided the project with a clearer understanding of community engagement and communication preferences for the WSERRC. Points of interest from the research findings, in relation to communication and engagement were:

- all communication increased the acceptability of an energy-from-waste facility in a local area;
- the initial understanding of energy from waste is low and there is a need for a general education on the benefits of energy-from-waste before any site-specific communication;
- creating 'energy-from-waste' has an added benefit of reducing waste;
- there is strong support for recycling, and energy-from-waste deals with materials that cannot be recycled;
- credible communication about health and safety is critical;
- Images and video would assist with communicating complex proposals; and
- there is a relatively high demand for engagement in relation to an energy-from-waste proposal.

3.1.3 The IAP2 Engagement Framework

IAP2 is a leading international organisation for the improvement and promotion of the practice of community and stakeholder engagement and public participation. It is a familiar logic to many government agencies at both the State and Federal level, and also to the community. IAP2 conducts nationwide training for engagement including Government staff on a regular basis.

IAP2's Public Participation Spectrum (Figure 9) is designed to assist with the selection of the level of participation that defines the public's role in any community engagement program. The spectrum shows that different levels of participation depend on the engagement goals, the time frame available for engagement, the resources available for activities and levels of community concern regarding the decision to be made. Most importantly, the IAP2 Spectrum sets out the promise being made to the public at each 'level' of participation.

INCREASING IMPACT ON THE DECISION

	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
PUBLIC PARTICIPATION GOAL	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.	To obtain public feedback on analysis, alternatives and/or decisions.	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision making in the hands of the public.
PROMISE TO THE PUBLIC	We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision.	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	We will look to you for advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.	We will implement what you decide.

Figure 9 - IAP2's Public Participation Spectrum (IAP2, 2014)

The process to engage with the community and stakeholders included activities to

- inform the community and stakeholders,
- activities to consult the community and stakeholders, and
- activities to involve the community and stakeholders (see section 3.4).

The engagement level for this proposal is generally that of *Consult*, to obtain public feedback on analysis, alternatives and/or decisions. This level of engagement involves meaningful and informed discussions with local residents, businesses and Government agencies. In a complex highly engineered proposal, which relies on scientific and technical evidence to commit to global best practice, 'consult' is considered an appropriate level of engagement.

This engagement level, in combination with the IAP2 core values for public participation, has informed a legitimate and authentic community engagement process for the project.

The project commenced consultation with the community in the WSERRC proposal from the announcement on the 3 October 2019, and then during the EIS process. This commitment then continues beyond proposal approvals. The project's ongoing commitment to community engagement can be viewed in *Section 5.3*.

A description of how community and stakeholder discussions led to modification of the proposal is contained in *Section 5.1.2.*

3.1.4 Community advice on how they would like to be consulted

The IAP2 resources for practitioners include a statement of 'Core Values', in which a value is that '*public participation seeks inputs from participants in designing how they participate.*'

The WSERRC project asked this question:

- in the qualitative and quantitative research; and
- in the start-up community workshop held in November 2019;

with clear feedback provided.

Research results

The qualitative research concluded that participants wanted engagement that provides:

- representative community engagement with options for different preferences (e.g. in person, online surveys);
- readily accessible, clear information without jargon; and
- absolute transparency.

The quantitative research provided the following insights.

- Most respondents said they would simply like to be informed about plans for any local energy-from-waste.
- Just under a third want to be consulted or more deeply involved. This level of expressed desire to get involved is considered relatively high compared to other infrastructure research undertaken by Newgate Research.
- The most trusted sources of information included scientific bodies and universities, the EPA, NSW Department of Health, and testimonies from communities living near existing facilities.

Community start-up workshop

On Saturday 9 November 2019, the project hosted a community workshop from 9.30am to 2.30pm at the Alpha Hotel, Eastern Creek, with 31 community and stakeholders in attendance (see *Section 3.5.5* for more information).

The workshop delivered the following results in relation to community information needs and preferences.

Information needs

Participants reported that they would like to see future community engagement that aims:

- to explain the process of planning and approving a centre;
- to address participant concerns that "we are a long way progressed" and that community engagement at this stage is still worthwhile;
- to ensure transparency;
- to explain why this site, in this location (a lot of people felt at the conclusion of the workshop that this was not explained satisfactorily). For example, "why the location is not west of the Blue Mountains?";
- to provide more evidence on the benefits of the proposal and human safety;
- to provide a clearer explanation in regard to the issue of climate change – this is especially a concern for young people; and
- to demonstrate an explanation of the proposal and our current recycling initiatives. This is to ensure the community doesn't think the proposal is a replacement for recycling. Most of all recycling is still encouraged.

Participants particularly stressed that this should include more information on:

- the proposal's risks – participants were looking for an honest conversation about *"what the risks are*"; and
- a clear description of how this is different to the previous The Next Generation proposal.

Information delivery preferences

When asked how/where participants would like to see information about this proposal:

- young people noted that they will read relevant articles they come across, and may do their own research on Google, but would like to see more about the proposal on social media and in local spaces, such as pop-ups, community newspapers or newsletters, local radio and future workshops;

- middle aged people would like to see a town hall meeting, live online discussions, and community forums; and
- older people would like to hear about the proposal through mainstream channels such as television, radio and (some) social media.

Across the groups, the preferences towards various information channels is described further below.

CHANNEL	RESPONSE TO CHANNEL
Social media	• Some like the use of social media, particularly sponsored links with videos, and note we should continue this activity. • Older groups were less enthused regarding social media (some don't follow Twitter/Facebook). • Some felt concerned that social would be trolled and make it hard for people to have good conversations. • Younger groups would like to see more information on social media, including Instagram (for example, short video animations).
Market stands and shopping centre pop-ups	• People like idea of pop-ups in supermarkets and markets as it's convenient and you can choose whether or not to go and speak to someone. • Suggestion was for a pop up at the Easter Show, or The Speedway on a busy day. • Should include pop-ups after working hours (Thursday evening or Saturday morning).
Website	• Generally, people like idea of a website with lots of information and videos. • Would prefer to have a discussion board on the site (with a reply from the project in 24 hours) rather than having to email questions. • Videos of overseas examples would be helpful and if community are talking – much better. • Requires overseas case studies about the long-term health effects on the residents living close to the facilities. • A more detailed animation product explaining the air cleaning technology is of interest and would be useful.
Further community discussions	• It was felt that more community discussion is needed, particularly to discuss the air quality and health issues (some admitted they are not sure they would attend as very busy). • People were keen to know how Blacktown Council would participate in these discussions. • Suggested that having an independent technical advisor would assist community groups and members of the community to trust the information. • The Citizens' Panel idea needs explaining, although most people were open to this concept and some noted they liked it.
Independent technical advice	• Participants noted they liked the idea of the consortium paying an independent expert to provide the community with a plain English 'judgement' or review of the science and health impacts of the proposal.

	• An option was for Council to appoint an individual panel (environmental specialists) to investigate Cleanaway's performance and transparency on the proposal and advise the community. • The younger group noted a preference that advisors and scientists should not be paid by Cleanaway.
Letter box drops	• It was suggested some people throw out the information delivered to their letterboxes, thinking it is junk mail. • Some participants noted they had received the information in their letterbox.
TV and radio	• One suggestion was that Cleanaway should do TV ads to explain the situation and benefits. • The use of radio was encouraged – radio interviews and 8 second adverts to note the proposal website was available with more information. • Cleanaway should contact 2SER, who work out of the Blacktown showgrounds for an interview.
Door knocking	• Door knocking activity should continue. • Younger people would like to see door knocking occur (say 10 kilometres) on weekends/out of business hours.
Schools – Principals and P+Cs	• The project should write to school P+Cs again within a wide area. • In the future, Cleanaway could offer programs for local schools to engage with the centre. • Internships to be considered.
Email alerts	• An email alert to stakeholders regarding when the website updates and the proposal progresses.
Site inspections of overseas examples	• It was felt having people visit good examples of energy from waste centre's; and report back, would be useful. • Younger people would like more interactive case studies of the overseas examples, such as videos, to be placed on the website.

Table 4 – Requests for different engagement activities

3.1.5 Project's response to these community inputs

Community information

The project's starting position was that stakeholders and the community need a good level of information on waste and how it is managed, in order to contextualise the proposal. Educational resources would need to explain the current waste management landscape and solutions to an environmental and resource crisis in Sydney. The community engagement program sought to inform and educate on a viable solution for only a part of Western Sydney's municipal waste, being the WSERRC.

Then, in regards to the proposal, the information priorities were established as:

- the health and safety aspects of the proposal;
- the greenhouse gas and climate change benefits of the proposal; and
- the overseas use of similar technologies and beneficial outcomes created.

Community engagement tools

The project listened to the suggestions on engagement tools. As a result, the tools that were used that respond to this community information included:

- continuing to door knock residences to introduce the proposal (including outside of standard working hours);
- taking on board all questions from the community start-up workshop and responding in detail to some 61 questions (when the information was available) in March 2020;
- holding an Air and Heath Citizens' Panel; with a representative group of community participants and stakeholder groups to discuss these issues in a 'deep dive' of several sessions;
- recording an interview with Blacktown Radio, to air in March 2020;
- having a stand for two days at the Blacktown Show in March 2020;
- an overseas expert to be able to discuss, first hand, the energy-from-waste experience in Europe, with the community and stakeholders in late March 2020;

  The team facilitated a 'virtual visit' by waste management and energy-from-waste policy expert from The Netherlands, Herman Huisman MSc. This 2-week tour Monday 30th March to Saturday 11th April included the Air and Health Citizens' Panel.

  Herman was senior advisor at Rijkswaterstaat (Dutch Ministry of Infrastructure and Environment), and he led the Netherlands' Waste Management Council that developed the national policy for recycling, energy-from-waste and circular economy.
- updating the proposal's website in March 2020; providing new resources and reformatting the information to provide greater community interactivity.

These suggestions will be reconsidered for the EIS Exhibition engagement (see Section 5.2).

3.1.6 Commitment to community relationships

The Blacktown Council SEARs make reference to demonstrating a social licence for the proposal. Social licence is a broad concept with varying definitions around acceptance. While social licence is not a statutory requirement, the project has committed to building respectful relationships with the government and the community - both the residential and business community - over the long-term. This ensures the community's changing needs, concerns and expectations are considered, relationships continue to build and an understanding of the WSERRC operations increases over time.

The NSW Energy from Waste Policy Statement (2015) refers to the legitimacy and relevance of energy from waste, stating *"The Environment Protection Authority (EPA) recognises that the recovery of energy and resources from the thermal processing of waste has the potential, as part of an integrated waste management strategy, to deliver positive outcomes for the community and the environment. Energy from waste can be a valid pathway for residual waste*". The project believes the WSERRC is a positive and safe step forward for developing a sustainable waste management future in Sydney for residual and business waste and forms part of a wider waste solution involving an investment across higher order aspects of the waste hierarchy. The applicant is committed to investing in waste avoidance, reuse and recycling.

To communicate the legitimacy and relevancy of the WSERRC, the applicant believes it is necessary to demonstrate the proposal:

- meets a need and is in the public interest;
- is supported by a government policy framework;
- is sited in an area that makes practical sense (e.g. accessible, industrial area, acceptable volume of traffic, appropriate and safe use of land);
- has adopted a legitimate community engagement process, following an established practice and core values (such as recommended by the IAP2);
- invests back into the community;
- provides a community education function; and

- acknowledges the concerns of all stakeholders.

Creating a genuine dialogue

A critical component of building relationships in the NSW community is described by the NSW Energy from Waste Policy Statement (2015) as *"essential that proponents provide effective information and public consultation about energy from waste proposals. As proposals progress from the concept to detailed development assessment stage proponents should engage in a genuine dialogue with the community and ensure that planning consent and other approval authorities are provided with accurate and reliable information."*

The consideration of a best practice engagement approach commenced in an initial team communication planning workshop in 2018. The proposal's engagement approach was subsequently informed by the community research and determined by the desire to engage stakeholders in a genuine dialogue.

> I wish you all the best of luck as I've said, I've gone from being extremely against it to believing it's a good thing.
> - Air and Health and Citizens' Panel member

The communications journey shown below in Figure 10 identifies the range of activities the proponent planned to begin building relationships within the community, with all activities considered under the overarching goal of engaging in a genuine dialogue. All activities are listed in Section 3.

Conversations were tracked across all the engagement activities. The progress in developing stakeholder relationships during the engagement from October 2019 to June 2020 are described in Section 4.4. The conclusions from this process are considered in Section 4.4.1.

THE COMMUNICATIONS JOURNEY…

	LATE 2018/ EARLY 2019 START PLANNING	EARLY TO MID 2019 PLANNING	OCTOBER 2019 ANNOUNCEMENT	OCTOBER/NOVEMBER 2019 PRELIMINARY ASSESSMENT	NOVEMBER 2019 – SEARs ISSUED AND EIS STUDIES	2020 EIS EXHIBITION	2020 CONSIDERING THE SUBMISSIONS	2021 IPC PROCESS	2021 DECISION
COMMUNICATIONS APPROACH	Qualitative and quantitative community research	Establish stakeholder views, understand expectations for engagement + study	First 30 days – Introducing ourselves and proposal	Conversations start in detail	Working together on critical issues	The proposals in detail. Responding directly to concerns.	Have we addressed **all** community and stakeholder ideas and concerns?	Is the case solid, does this meet planning requirements?	Clarity on next steps
STAKEHOLDER AND COMMUNITY PERSPECTIVE	**What do people really think about waste and this technology?**		**What is proposed and how is it OK?**	**What would reassure me?**		**Does this make sense?**		**Do I feel satisfied that everything has been addressed?**	
STAKEHOLDER ENGAGEMENT	Meetings with • NSW Environment Protection Authority • NSW Premier and Cabinet • Department Primary Industries • Western City and Aerotropolis Authority • Blacktown Council; Fairfield Council; WSROC • NSW Health • Western Sydney Planning Partnership • Western Sydney Parkands Trust • Relevant Ministers and their staff – Environment & Energy, Planning, Western Sydney		Discussions with • Western Sydney industry groups – WSROC, Western Sydney Leadership Dialogue, Western Sydney Business Chamber, Committee for Sydney • Groups interested in waste policy and management - WMRRA, Infrastructure Partnerships Australia, Environment groups; Office of the Chief Scientist • Western Sydney councils • Federal Members holding local seats (2) • State members holding local seats (4) • Mayors and local government Councilors		• Ongoing stakeholder engagement and meetings • Overseas specialist tour	• Detailed presentations to Blacktown and Fairfield Councilors • Air and Health Citizens' Panel	• Submissions assessment process	• Stay in touch as per our commitments to accessibility	• Stay in touch as per our commitments to accessibility
PEAK COMMUNITY GROUPS	Understand the views of community groups nationally, statewide and locally Consider other similar projects across the country and locally – questions and issues raised		Reach out to all local groups with accurate, evidence based, timely information	Engage in constructive workshop on the EIS inclusions	Attend meetings Roundtable of group representatives Air | Emissions | Health investigations	Roundtable meeting on the EIS results	Submissions assessment process	Stay in touch with all stakeholder as per our commitments to accessibility	Stay in touch with all project stakeholders as per our commitments to accessibility
MEDIA AND SOCIAL MEDIA		Preparation for media interest: • Media kit • Announcement schedule • Project video	• Newgate working with media outlets • Soft social media strategy • Project website	• Media interviews • Media questions • Website updates	• Media interviews • Media questions • Website update	• Newgate working with media outlets • Social media • Media interviews • Website update	• Submissions assessment process	• Media questions	• Newgate working with media outlets • Social media • Media interviews • Website updates
COMMUNITY ENGAGEMENT	• 4 focus groups • 2285 surveyed including Prospect	• Mobilising carefully • Collateral and explanations	• Community outreach using a range of channels.	• Start of two-way engagement • Deliberative workshop on EIS inclusions	• Two-way information • Pop-ups • Citizens' Air and Health panel • Project email/1800 line	• Community outreach using a range of channels. • Plain, timely, accessible information	Submissions assessment process	• Plain, timely, accessible information	• Plain, timely, accessible information

Figure 10 - The WSERRC communications and engagement journey map

3.2 STAKEHOLDER AND COMMUNITY ENGAGEMENT OBJECTIVES

The following community and stakeholder engagement objectives were developed by the project upon considering the IAP2 public participation spectrum (inform, consult, collaborate, involve and empower), community research results, and the communications journey. The objectives are as follows.

Information - Provide information about the Western Sydney Energy and Resource Recovery Centre (WSERRC) that is comprehensive, accessible and trustworthy

Feedback – Actively seek and respond to community and stakeholder views

EIS process - Clearly explain the EIS process and opportunities for community and stakeholder engagement throughout the process

Two-way consultation - Exchange detailed information from technical investigations through discussions with community and stakeholders

3.3 ENGAGEMENT WITH STAKEHOLDER GROUPS

To help design the engagement strategy and the tools that should be used, it is useful to broadly identify the different groups who may need information in different formats or through different channels. Several groups were identified for engagement that may have an interest in the proposal, listed below.

STAKEHOLDER GROUP
Group 1 Residents, businesses and community stakeholders (for example schools) **closest to the WSERRC** (339 Wallgrove Road, Eastern Creek). These included adjoining residents and businesses in the areas of Horsely Park, Erskine Park, the industrial area opposite the site (on the other side of Wallgrove Road and the Westlink M7), and sections of St Clair, Wetherill Park and Minchinbury (see Figure 11).
Group 2 Residents and businesses and community stakeholders within an 8km radius of the WSERRC location who may view the site as being in their locality or region and may therefore have an interest (see Figure 12).
Group 3 Residents and all other groups with an interest in the project. Regional residents and groups may be interested in waste management, or the technology proposed at WSERRC.
Group 4 Government agencies – local, State and Federal agencies.
Group 5 People who, following the project announcement, subsequently registered their interest.

Table 5 – Identified stakeholder groups

The engagement tools to reach these different stakeholder groups are described in Section 3.4.

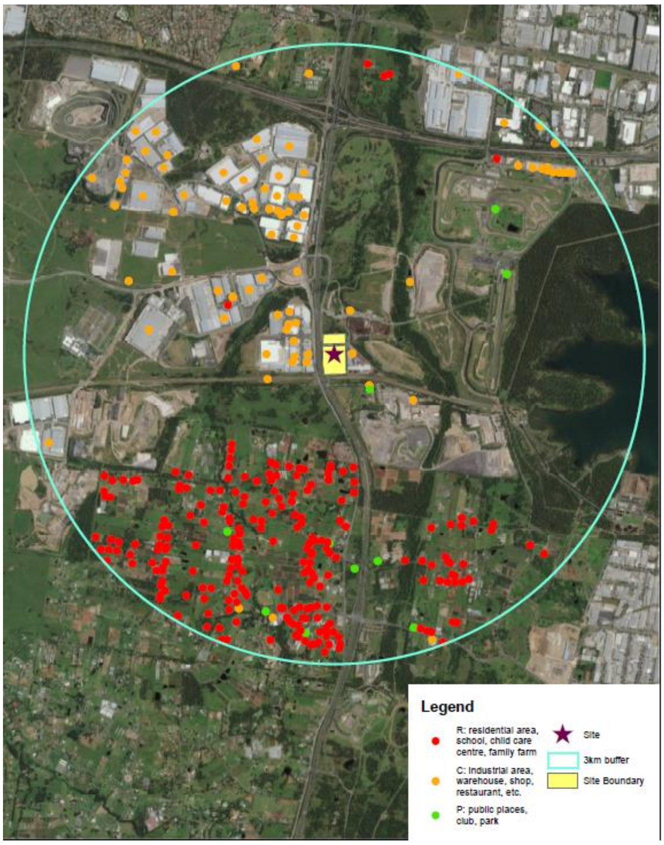


Figure 11 - Site map of surrounding residences, special land uses and businesses

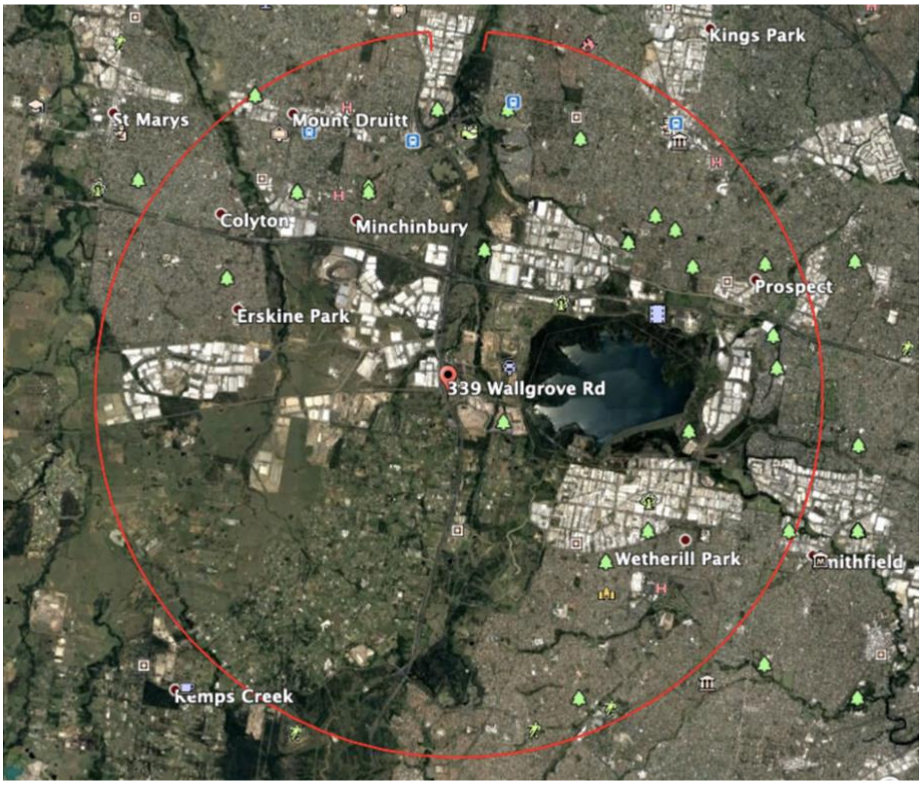


Figure 12 Site map of surrounding community with an 8km radius from the site

3.4 TOOLS TO MEET THE ENGAGEMENT OBJECTIVES

3.4.1 Engagement tools that reflect the IAP2 Framework

Various engagement tools were used to provide different mediums of engagement. Employing a wide range of engagement tools (that span different mediums for information delivery) maximises accessibility of this information and the ability of various stakeholders to engage with the proposal. The tools selected provided the means to implement the objectives of the communication and stakeholder engagement strategy and enabled genuine dialogue with the community, businesses and government agencies.

INFORM ACTIVITIES	CONSULT ACTIVITIES	INVOLVE ACTIVITIES
Ways for community and Stakeholders to receive information	**Ways for the community and stakeholders to submit information to the project**	**Ways to have two-way information exchange**
• Postcard mail-box dropped • Proposal brochure • Proposal website • Video assets • Frequently asked questions document • Media information • Advertising in local newspapers • Print media and radio interviews • Social media posts • Email updates to the proposal stakeholder database • Question and answer document to participants at the November 2019 workshop • Air and Health Citizens' Panel meetings – the summary notes published • Videos providing information from overseas experts	• 1800 information line • Proposal email address • Feedback at events • Start-up community workshop	• 1800 information line • Proposal email address • Shopping centre pop-ups • Door knocking • Start-up community workshop • Air and Health Citizens' Panel • Blacktown Show 2-day event* • Meetings with local businesses regarding potential use of the WSERRC outputs • Council meetings • Agency meetings and correspondence exchange • Stakeholder group meetings

Table 6 – Community and stakeholder engagement tools to meet IAP2 levels of participation

* Note that this event had no attendance given COVID19 circumstances.

3.4.2 Engagement tools to reach different stakeholder groups

The table below lists a range of these tools and how they apply to the different stakeholder groups described in Section 3.3.

STAKEHOLDER GROUP	Community research	Direct outreach including door knocking	Meetings	Agency meetings and correspondence exchange	Project 1800 line, email address and feedback forms	Postcard mailbox drop	Proposal brochure	Proposal website	Video assets	Frequently asked questions document	Media information (print, radio) and social media	Advertising in local newspapers	Email updates to the stakeholder database	Air and Health Citizens' Panel	Start-up community workshop	Pop up information stands at shopping centres and markets
Group 1		✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
Group 2	✓		✓		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
Group 3	✓				✓			✓	✓	✓	✓	✓				✓
Group 4			✓	✓				✓	✓	✓			✓	✓	✓	
Group 5								✓	✓	✓			✓			

Table 7 – Community and stakeholder engagement tools for each stakeholder group

3.4.3 Timeline of activities

A timeline of engagement activities follows. This timeline demonstrates engagement from October 2019 with a commitment to ongoing community and stakeholder engagement.

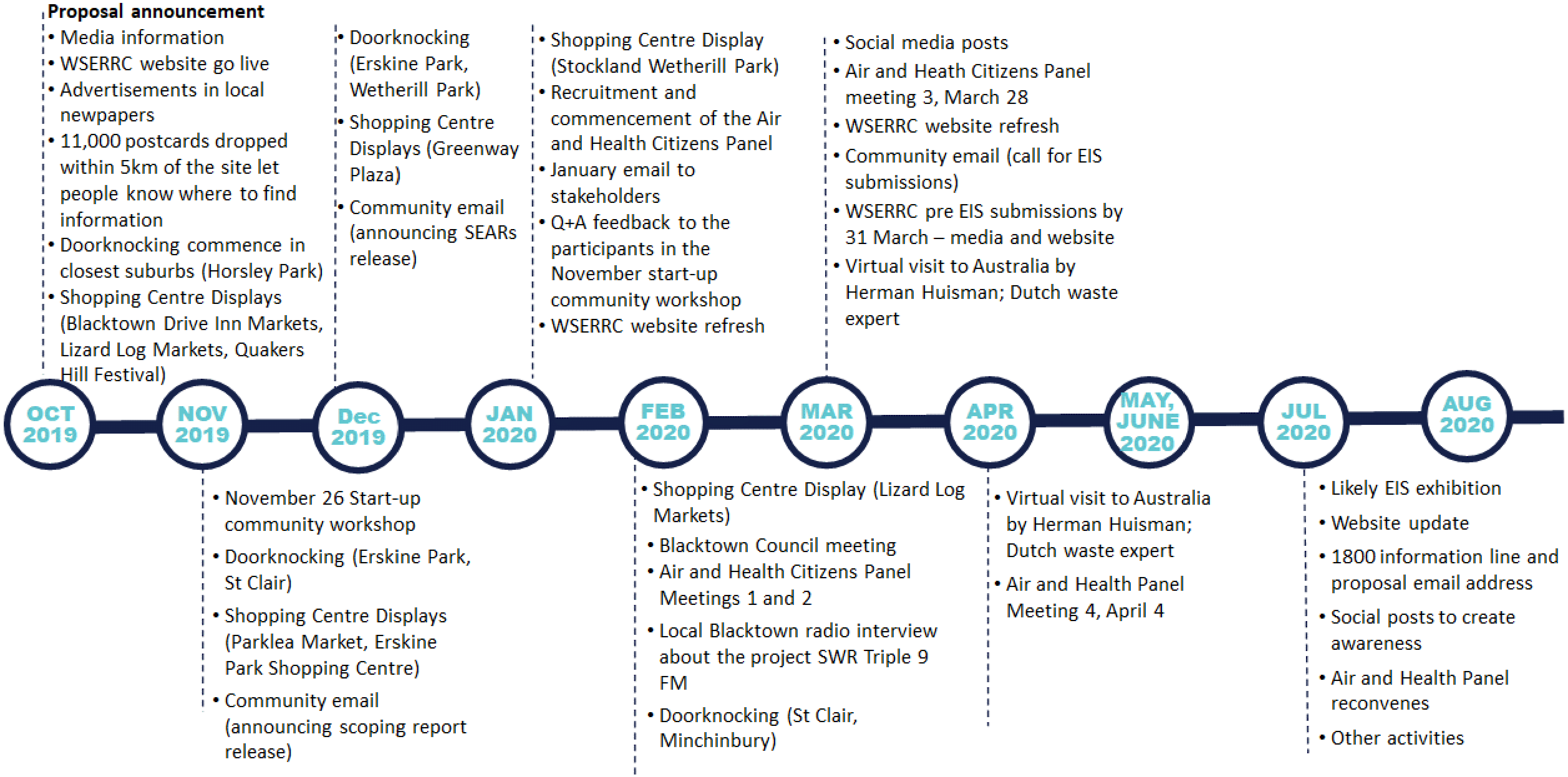


Figure 13 – Timeline of engagement activities

3.4.4 Summary of engagement activities

A summary of the community and stakeholder engagement activities follows.

TOOL	OBJECTIVE/S	DESCRIPTION
Postcard mail box drop		Four different types of postcard were distributed on the 3 and 4 October 2019 to 11,000 households in the Erskine Park, Minchinbury, Horsley Park, Bossley Park, Cecil Park, Mount Vernon, Prospect and Abbotsbury areas.
Community brochure		An eight-page color brochure was distributed to the community in all of the project's activities. The plain English document was accessible with images and infographics to assist a wide range of readers. The brochure was provided to residents during door knocking (if further information was requested, or if the resident was not home during the activity), at shopping centre pop-up stalls, community workshops and stakeholder meetings.
WSERRC website	EIS	The proposal's website (www.energyandresourcecentre.com.au) was launched on 3 October 2019, to provide community information on the WSERRC. It contains images and videos to assist with communicating complex issues. It has best practice usability and accessibility standards. The content on the website provides transparent, timely, and meaningful information to the community about the proposal and particulars about how WSERRC contributes to a sustainable future. The website includes content about proposal milestones, resources, the proposal's Scoping Report and the SEARs document. The website was established to provide the largest possible audience (including those who avoid or are unable to attend face-to-face interactions) with information about the proposal, and how to submit their feedback. The website's address is promoted on the brochure, media releases, advertising in local newspapers, door knocking slips, newsletters and social media posts.
Media releases		Media releases assist with providing information about the WSERRC to the largest possible audience. Releases produced by the project included: • "Cleanaway launches plan for energy-from-waste proposal using leading technology to safely power Western Sydney" (3 October 2019) ○ Estimated audience reach: 5,379,000 ○ Online coverage: 24 ○ Print coverage: 20

TOOL	OBJECTIVE/S	DESCRIPTION
		○ TV coverage: 15 ○ Radio coverage: 8 • "Best practice emissions controls for proposed Western Sydney Energy and Resource Recovery Centre" (13 December 2019) ○ Estimated audience reach: 150,000* ○ Online coverage: 1 *This data is based on average readership. Monitoring was not available for this received coverage.
Advertising in local papers		15 advertisements were placed in in the following local publications: Blacktown Advocate, Blacktown Advertiser and Fairfield Advance from 3 October to 31 March 2020. Each advertisement featured the website address and phone number to provide the community with the opportunity to ask a question or submit feedback. Print newspaper advertisements were used to reach and inform an audience that may not be digitally capable.
1800 information line and proposal email address	EIS	The proposal email address is energyandresourcecentre@cleanaway.com.au and the toll-free phone number is 1800 97 37 72. The email and toll-free phone number enable accessible, two-way information exchange opportunities for everyone, including those who could not access the project in person or online. The proposal email and toll-free phone number are promoted on the proposal's website, brochure, media releases, advertising materials, door knocking slips and the newsletter. Between October 2019 and March 2020, 13 emails and 20 phone calls were received. All queries requiring a response were resolved.
Community website updates and email updates		Email updates aligned to proposal milestones, as follows: • Scoping Report released: 247 emails sent on 25 November 2019 • SEARs released: 233 emails sent on 17 December 2019 • Final call for community information to be considered in the preparation of the EIS and updated website: 233 emails sent on 9 March 2020. The list of recipients was collated from: • State and Federal Members of Parliament; • Local government

TOOL	OBJECTIVE/S	DESCRIPTION
		o Blacktown City Council o Fairfield Council; • NSW government agencies; • Local schools (both primary and high schools); • People who have subscribed to the website mailing list; • Individuals who have signed up in person at pop-up displays to receive more information; and • Community workshop participants who requested further information**.**
Door knocking		Door knocking is a simple yet effective way of contacting the community, understanding on-the-ground ideas and issues, and assisting with an educational process. If the community was not home when door knocking took place, an information brochure was left and encouraged to provide feedback to the team by the proposal email address or toll-free phone number. Between October 2019 and February 2020, 3061 doors were knocked resulting in 789 interactions with community members located in: Horsley Park (including the industrial park opposite the site), Erskine Park, St Clair, Wetherill Park and Minchinbury.
Information stands at markets and shopping centres		The project incorporated community information stands at shopping centres and highly populated events in the Western Sydney area to provide the community with an informal two-way information exchange opportunity. The information stands are promoted via the proposal's website. Between October 2019 and February 2020, a total of 676 interactions occurred at the following locations: Blacktown Drive Inn Markets (Blacktown), Lizard Log Markets, Quakers Hill Festival, Parklea Market (Blacktown), Erskine Park Shopping Centre, Greenway Plaza (Wetherill Park) and Stockland (Wetherill Park).

Table 8 - Summary of the community and stakeholder engagement activities

Haven't heard of project but speaking with consultant can see benefits. Asked about electricity benefits r.e. reduced waste? Advised that will send email after looking at website. Will want to look out for EIS and state government decision. 'You sold me, sounds good'.

Sounds like a great idea. I like the engagement that is happening.

Weren't keen on having anything burned - objected The Next Generation. Pollution concerns. Agree with energy from waste but not location. 'At least you're talking, the other mob weren't'.

Main concerns are everything. Mum of four. Doesn't like the location. 'Stick it next to the lodge'. Pop ups haven't been told with enough notice & time. Erskine Park shopping centre wasn't told with enough notice. Not against the idea though. 'Good luck'.

Hadn't heard about the project - first time today. Likes that FAQ online and easy to find.

Didn't want a brochure. Negative about being door knocked.

Figure 14 – Sample of 6 quotes from door knocking and the pop-up information stands, that focus on the process. A mix of positive, neutral and negative comments are provided.

We are running out of space for landfill. You are doing double benefit. Getting rid of waste and providing electricity. Win win.

Thinks it's a fantastic idea, not sending to landfill. Must do more to manage our waste, considering how Western Sydney is growing. Spoke about technology and presence in cities and towns. Asked about emissions and was satisfied about technology and new solutions. "We're all for it".

I would like to know if it affects the real estate value of both houses and land in both short and long term affect on value.

Asked questions about facility. Brought up airport, smells. Thanked for coming to inform her and for the community engagement. Wanted to know what happens with chemical waste that can't be burnt.

Pollution is the main issue. Would not take a brochure. Stated 'I'm dead against it'.

Pollution concerns drop in land value in area. Second submission in area. 'Kids don't need it'. Tip odour already. Location issues, realises further out wouldn't be cost effective but not here. Thinks it's a great idea but 'don't con us'.

Figure 15 – Sample of 6 quotes from the door knocking and the pop-up information stands that focus on issues raised about the project. A mix of positive, neutral and negative comments are provided.

3.5 STAKEHOLDER MEETINGS

This Section highlights the stakeholder briefings and meetings that have occurred during the development of the WSERRC EIS. Stakeholders consulted with as part of this proposal include those listed in *Section 3.5.1, 3.5.2, 3.5.3* and *3.5.4*.

3.5.1 Meetings with government and senior stakeholders

Objective/s contributed to:

Overview

The table below provides a summary of the agency and stakeholder meetings held as required by the SEARs.

AGENCY		DATES MET
Blacktown City Council (BCC)	Local government	02/10/2019, 12/02/2020, 13/02/2020, 16/04/2020, 07/05/2020
Fairfield City Council	Local government	05/02/2020, 03/04/2020
Environment Protection Authority (EPA)	State Government agency	25/03/2020, 08/04/2020, 30/04/2020
Department of Primary Industries (DPI)	State Government agency	04/10/2019, 28/05/2020
Environment, Energy and Science (DPIE)	State Government agency	26/09/2019, 10/10/2019, 13/11/2019, 26/11/2019, 03/04/2020, 08/04/2020
Transport for NSW (TfNSW)	State Government agency	14/02/2020, 07/05/2020
NSW Ministry of Health	State Government agency	Please see NSW Health notes
Western Sydney Local Health District (part of NSW Health)	State Government agency	04/09/2020
Fire and Rescue NSW (FRNSW)	State Government agency	06/04/2020 (correspondence)
Natural Resources Access Regulator (NRAR) (DPIE)	State Government agency	Not applicable, no response received
Sydney Water	State Government agency	29/01/2020
Endeavour Energy	State Government agency	25/10/2019
SafeWork NSW	State Government agency	14/05/2020 (correspondence), 28/05/2020 (correspondence)
Western Sydney Airport Corporation (WSA Co)	Federal Government agency	14/05/2020, 28/05/2020 (correspondence)
Civil Aviation Safety Authority (CASA)	Federal Government agency	28/04/2020 (correspondence)

Department of Agriculture, Water and Environment	Federal Government agency	6/05/2020, 13/05/2020

Table 9 - Meetings with government agencies

Additional government agency meetings were held.

3.5.2 Additional meetings with government and senior stakeholders

Objective/s contributed to:

Overview

The table below provides a summary of the additional agency and stakeholder meetings held in addition to the SEARs.

STAKEHOLDER GROUP	DATE MET
Airservices Australia	30/04/2020 (correspondence), 22/05/2020 (correspondence)
Canterbury Bankstown Council	12/03/2020
Cumberland Council	31/02/2020, 18/02/2020
Hawkesbury Council	26/03/2020
Liverpool City Council	03/03/2020
Parramatta Council	07/11/2019, 20/02/2020
Penrith City Council	05/03/2020
The Hills Council	27/02/2020
WaterNSW	20/03/2020, 10/06/2020 – 12/06/2020 (correspondence)
Western Sydney Parklands Trust (WSPT)	09/09/2019, 22/05/2020
Wollondilly Council	17/03/2020

Table 10 - Other government stakeholder meetings

3.5.3 Other stakeholder meetings

Engagement objectives contributed to:

Overview

STAKEHOLDER GROUP	DATE MET
Blacktown & District Environmental Group representative	14/01/2020
Committee for Sydney	11/02/2020
Dr Hugh McDermott, MP, NSW Member for Prospect	03/10/2019, 18/10/2019, 9/11/2019
Indigenous groups: A1 Indigenous Services, Deerubbin Local Aboriginal Land Council, Aragung Aboriginal Cultural Heritage Site Assessments, Barking Owl Aboriginal Corporation, Barraby Cultural Services, Biamanga, Butucarbin Aboriginal Corporation, Darug Custodian Aboriginal Corporation, Dharug Ngurra Aboriginal Corporation, Dhinawan Culture and Heritage, Didge Ngunawal Clan, Goodradigbee Cultural & Heritage Aboriginal Corporation, Kamilaroi Yankuntjatjara Working Group, Merrigarn, Muragadi Heritage Indigenous Corporation, Murra Bidgee Mullangari Aboriginal Corporation, Murramarang, Ngambaa Cultural Connections, Paul Gale, Tocomwall, Waawaar Awaa Aboriginal Corporation, Widescope Indigenous Group, Yulay Cultural Services, Yurrandaali	20/03/2020 – 18/02/2020
Office of the Minister for Energy and Environment	12/07/2019
Mr Anoulack Chanthivong Member, Legislative Assembly Committee on Environment and Planning	17/10/2019

Ms Kate Washington MP, Shadow Minister for Environment and Heritage	11/03/2020
Ms Tanya Davies, MP NSW Member for Mulgoa	05/11/2019, 20/11/2019
NSW Chief Scientist & Engineer	30/08/2019, 31/03/2020
NSW Department of Premier and Cabinet	1/11/2019
Planet Ark	01/10/2019
Western Sydney Leadership Dialogue	02/10/2019, 14/10/2019
Western Sydney University	24/01/2020, 05/03/2020

Table 11 - Other stakeholder meetings

3.5.4 Engagement with businesses

Objective/s contributed to:

Overview:

STAKEHOLDER GROUP	DATE MET
Austral Bricks	28/02/2020
Better Burn Firewood	03/10/2019
Boral Cement Works	20/05/2019
Canberra Data Centre	20/02/2020
Gazcorp	27/05/2020
Little Grace's Child Care Centre	03/10/2019
NBN	18/03/2020
SUEZ	26/02/2020
Sydney Zoo	15/01/2020
Transgrid	20/05/2020
Westlink M7	28/02/2020
Western Sydney Business Chamber and the Sydney Business Chamber	01/10/2019

Table 12 - Meetings with businesses

3.5.5 Community start-up workshop, November 2019

Engagement objectives contributed to

Overview

On Saturday 9 November 2019 a community workshop was held with community members and stakeholders in attendance.

27 community members were recruited to attend the workshop. These community members live in a mix of suburbs (Blacktown, Fairfield, Penrith and Cumberland Council areas including Abbotsbury, Bossley Park, Cecil Park, Eastern Creek, Erskine Creek, Horsley Park, Minchinbury, Mount Vernon, St Clair and Wetherill Park) within an 8 km radius of the proposed WSERRC site and considered to be a group representative of the locality.

The workshop was held at a location (the Alpha Hotel, Eastern Creek), that is in close proximity to the proposal site at 339 Wallgrove Road.

The aim of the start-up workshop was to consult with a diverse cross-section of the local Western Sydney community approximately a month after the proposal's announcement on October 3, 2019.

The workshop objectives were to:

- understand the key issues from a recruited broad cross-Section of the local community;
- seek feedback on the best channels to communicate with the community and priority content;
- further refine the communication and engagement plan;
- provide feedback on the output from the workshop and the refined plan to various stakeholders; and
- use the output to inform the EIS.

Presentations commenced with an explanation of the Sydney waste management landscape; and then the proposal, how the energy from waste process works; air and health considerations and community engagement plans.

The workshop was delivered in an interactive manner, with whole group discussions and break-out group discussion sessions. There were briefings from senior project members, questions and answers on these briefings and instant polling of priority questions.

Stakeholder attendees

- Dr Hugh McDermott MP (Member for Prospect)
- Councillor Kathie Collins OAM (Blacktown City Council)
- Donna Wallace (Manager Environment, Blacktown City Council)
- Vincent Shepherd (A/Team Leader Environmental Health, Blacktown City Council)
- Antony Lewis (Blacktown District and Environment Group)
- community members.

Figure 16 - The community start-up workshop

3.5.6 Air and Health Citizens' Panel, 2020

Engagement objectives contributed to

Overview

During consultation with community, comments around the impact of the proposed Centre on air quality and human health were raised, including requests for additional information. This led to the establishment of the Air and Health Citizens' Panel with a group of residents that were recruited so as to be representative of the local area.

There were four Air and Health Citizens' Panel sessions held on:

- Saturday 15 February 2020 at the Atura Hotel Blacktown
- Saturday 7 March 2020 at the Atura Hotel Blacktown
- Saturday 28 March 2020 using an online tool (Recollective)
- Saturday 4 April 2020 using online tools (Recollective and Zoom)

Note: Due to the 2020 COVID-19 pandemic and government restrictions, the third and fourth Air and Health Citizens' Panel session were efficiently moved from face-to-face to an online environment. Participants and panel members were invited to continue with a new format in an online space, and this move was willingly accepted.

Objectives

The Citizens' Panel had the objectives of:

- Engaging the community on an issue that requires a lengthy and detailed conversation (i.e. a deliberation)
- Undertaking a fact-based examination of the project and its potential to impact air quality and human health
- Examining the community response to the air quality assessment considerations – does it assess factors important to the community?
- Examining the community response to the health assessment methodology – do they feel it is adequate?
- Demonstrating to the wider community the results of a deliberative process regarding the proposal, air quality and health.

Objectives of each panel session

The objectives of each session follow.

SESSION 1	SESSION 2	SESSION 3	SESSION 4
• Ensure participants had a similar level of understanding of energy-from-waste and the proposed Centre. • Capture the specific areas of air and health that the community was interested in to inform the agendas for the following sessions. • Enable technical experts to provide responses to core questions in the following sessions.	• Discuss the methodology for modelling the expected emissions from the Centre • Capture the specific areas of air quality assessments that the panel was interested in (to make sure it is covered in the EIS) • Capture questions around potential health impacts of the proposal to inform the agenda for the following sessions.	• Discuss the legislation, and health assessment in relation to the proposed Centre. • Capture the specific areas of health assessment that the panel was interested in (to make sure it is covered in the EIS). • Capture final questions and comments on all aspects of the proposal to inform the agenda for the final session.	• Provide an international perspective on energy-from-waste • Outline the approach to operational redundancies and accountability • Examine the disposal of the air pollution control residues • Examine long-term monitoring of the Centre and penalties for non-compliance • Capture any final areas of the air and health assessment process that had not yet been discussed.

Table 13 - Session objectives for the Air and Health Citizens' Panel

Panel attendees

- Representatives of Cleanaway and Macquarie Capital
- Technical specialists within the area of air quality and health assessments
- Independent technical experts, at the request of the panel members
- Newgate Engage (meeting facilitator and table facilitators)
- 25 residents - recruited from a broad cross Section of suburbs surrounding the proposed proposal site
- Western Sydney Direct Action
- Blacktown District and Environment Group
- NSW Health (observer)
- Blacktown City Council (two observers)

The issues raised in the panel are described in Appendix B and the full Citizens' Panel Report is on the WSERRC project website as a resource.

Figure 17 - The Air and Health Citizens' Panel meeting 1

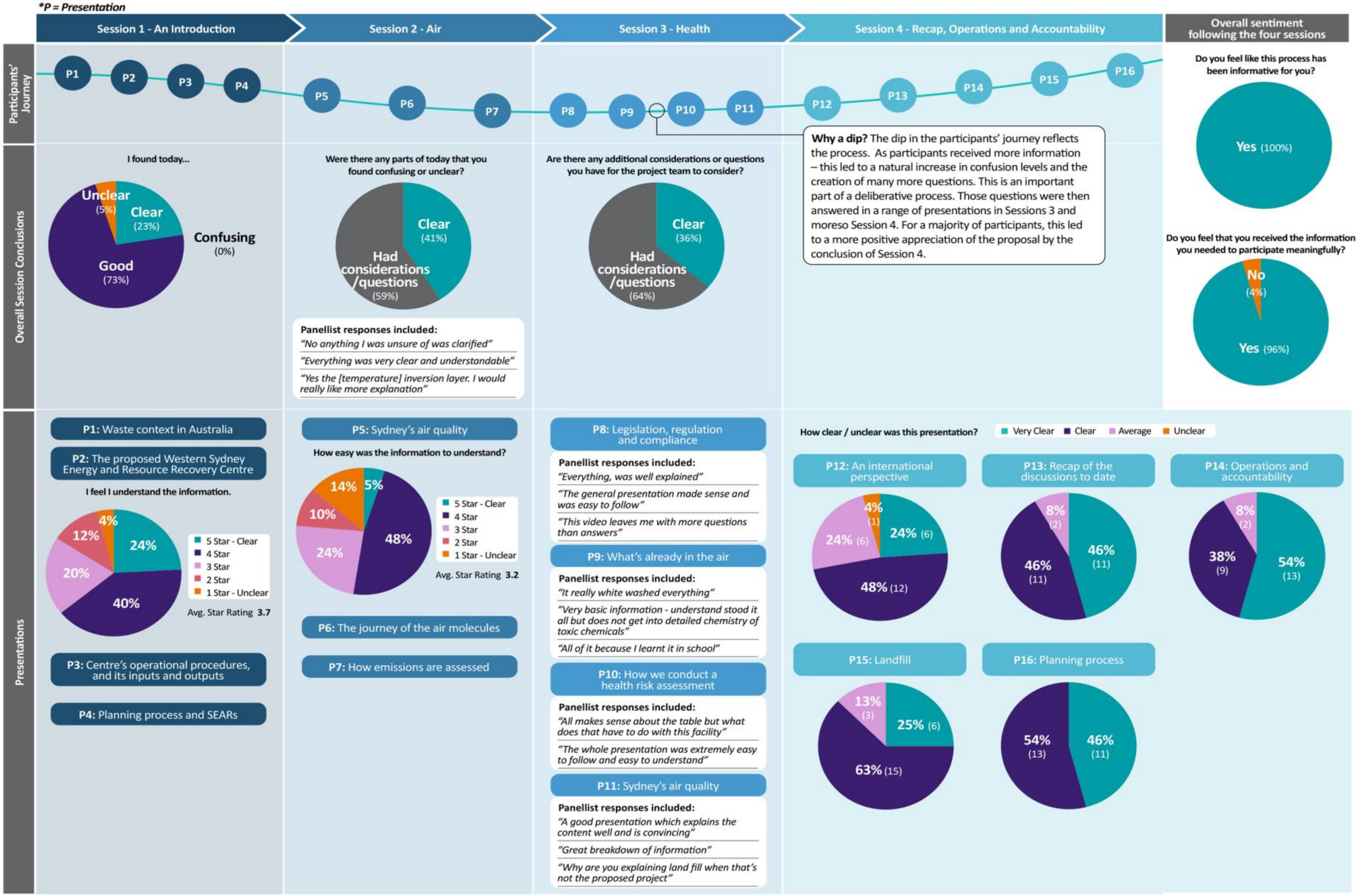


Figure 18 - The Air and Health Citizens' Panel Journey Map

Participants conclusions on this process

Below is a sample mix of 12 quotes from participants on the panel process. There are six quotes on the process of the Air and Health panel and another six on issues people are concerned about in regard to the project. The comments are verbatim and describe a mix of feelings about the issues and the process just completed - positive, neutral and negative sentiment. The comments are taken from the final survey participants completed after session four (overall 23 participants and 16 questions providing 368 responses). As shown in Figure 18 – Citizens' Panel Journey Map, these comments reflect the overall distribution of panel sentiment at the end of the process.

Process community quotes

Figure 19 -Sample of Citizen's Panel quotes on the process

Issues community quotes

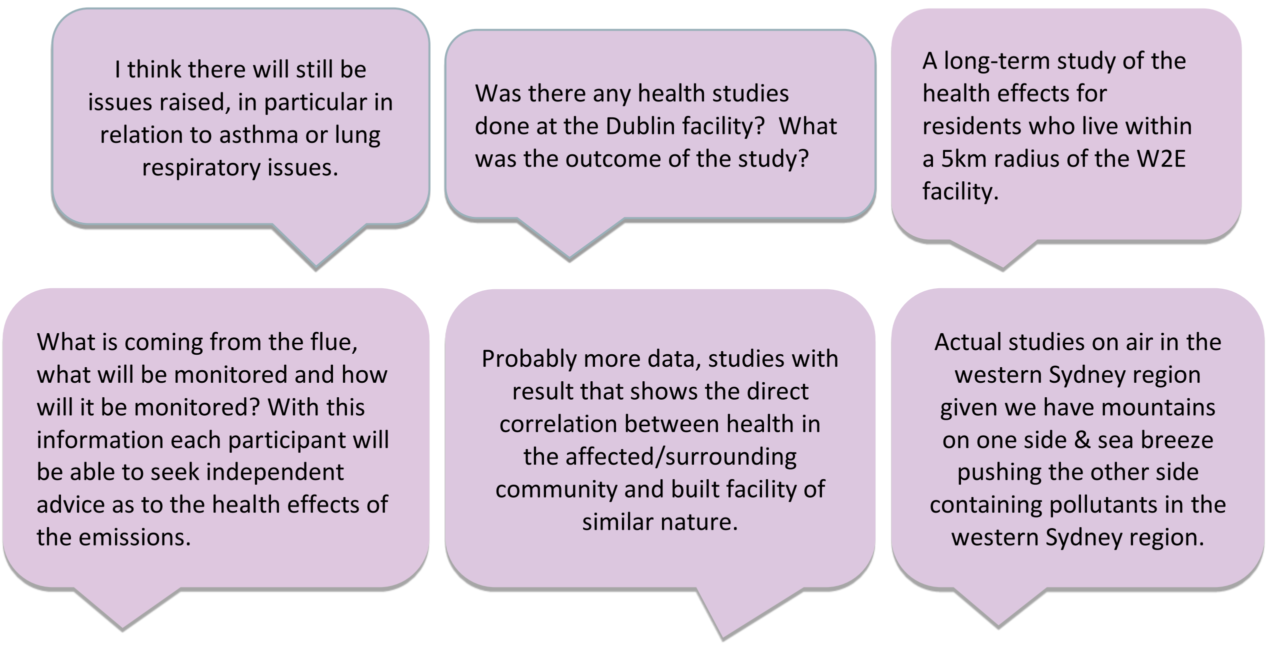


Figure 20- Sample of Citizen's Panel quotes on the process

Further engagement opportunity for the citizens' panel during the EIS exhibition

22 of the 23 participants of the panel have expressed confidence in the process and are keen to resume discussions when the EIS is placed on exhibition.

Yes I would love to come back and discuss stuff, it's a strange feeling but I feel very invested in this now

If there is any additional sessions, I would love the opportunity to continue to be a part of representing the wider community

Yes surely interested to reconvene as I feel we are part of the consultation process and I would like to track the progress of the proposal up to the end.

Figure 21 - Interest in further engagement

3.5.7 Herman Huisman Virtual Tour

A scientist by training, Herman Huisman was a senior advisor, international cooperation at Rijkswaterstaat (RWS), an agency of the Dutch Ministry of Infrastructure and Environment, until his retirement on 1 January 2020. He has, since the early 1990s, been centrally involved in addressing the Netherlands' waste crisis and developing a national policy for recycling and Energy from Waste. The country has since become a recognised leader in the field of Energy from Waste and has recycling rates among the world's highest.

Herman's virtual tour provided factual information about the Netherlands experience as a successful case study for waste management. Herman has a wealth of practical experience and says Energy from Waste is seen as safe and widely accepted in his country as providing inexpensive renewable energy by reusing the 25% of waste that cannot be recycled. The advantages of energy-from-waste highlighted by Mr Huisman include:

- Volume reduction of the waste and thus low demand for land fill space;
- Generation of electricity or heat thus substituting fossil fuel consumption;
- Can be situated close to urban areas, reducing the need of transportation;
- Substantial reduction in greenhouse gas emissions (compared to landfill);
- Ferrous and non-ferrous metals can be recovered from the bottom ash;
- Bottom ash can be safely utilized in construction work as aggregate the inert; and
- Waste to Energy installations can meet with the strictest emission regulations.

The table below provides a summary of the agency and stakeholder meetings held with Herman Huisman.

AGENCY	DATE MET
NSW Chief Scientist and Engineer	30/03/2020
Planning and Environment Standing Committee of Parliament	01/04/2020
Fairfield City Council	01/04/2020
Department of Planning, Industry & Environment	01/04/2020
Air and Health Citizens' Panel	04/04/2020
Infrastructure Partnerships Australia seminar	08/04/2020

Table 14 – Herman Huisman meeting schedule

3.6 DIGITAL ENGAGEMENT

3.6.1 Proposal website

Objective/s contributed to:

Results overview:

The proposal's website (www.energyandresourcecentre.com.au) was launched on 3 October 2019, to support the public announcement of the WSERRC. As of 31 March 2019, the website had attracted 2,607 sessions; as described in Table 14.

WEBSITE CHARACTERISTICS

Different users	1,571
Sessions	2,607
Number if sessions per user	1.66
Page views	3,828
Pages per session	1.47
Average session duration	1.46 minutes

Table 15 - WSERRC website overview data for the period 3 October 2019 to 31 March 2020

The website's primary purpose is to provide visitors with a platform to learn about the proposal and connect/provide feedback or comments on the WSERRC. Of the 1,022 users from Sydney who utilised the website – 103 of these visitors accessed the *Resources* page for additional information and 52 accessed the *Contact us* page.

Some 21% of the WSERRC website's visitors came from social media (either Facebook, LinkedIn or Twitter). This data supports the project's engagement activities on social media.

Social Network	Sessions	Pageviews	Avg. Session Duration	Pages / Session
1. Facebook	269 (81.27%)	414 (83.64%)	00:02:04	1.54
2. LinkedIn	39 (11.78%)	52 (10.51%)	00:01:25	1.33
3. Twitter	23 (6.95%)	29 (5.86%)	00:02:21	1.26

Figure 22 - Social media referral traffic to the WSERRC website

3.6.2 Social media posts by Cleanaway

Objective/s contributed to

Overview

Social media posts were made to increase awareness amongst a broader audience, educate viewers and redirect traffic to the project website.

DATE	PLATFORM	ENG.	REACH
03/10/2019	Facebook	Likes: 29 Shares: 3	1,152
03/10/2019	Twitter	Retweet: 1 Likes:3	699
03/10/2019	LinkedIn	Likes: 101 Shares: 15	6,009
06/11/2019	Facebook	Likes: 56 Shares: 6	2,079
06/11/2019	Twitter	Retweets:2 Like:1	1,203
06/11/2019	LinkedIn	Likes: 109 Shares:6	6,193
13/11/2019	Facebook	Likes: 18 Share: 1	733

13/11/2019	Twitter	Retweets: 2 Likes: 2	999
13/11/2019	LinkedIn	Likes: 34 Shares: 5	3,086
21/11/2019	Facebook	Likes: 20 Share: 1	1,121
21/11/2019	Twitter	Like: 1 like	1,242
21/11/2019	LinkedIn	Likes: 52 Shares: 6	4,407
06/03/2020	Facebook	Event advertisement Likes: 90 Shares: 20	58,232

Table 16 - List of social posts by Cleanaway regarding WSERRC

4. ENGAGEMENT RESULTS

4.1 GOVERNMENT AND AGENCY FEEDBACK

Agency feedback is documented as part of:

- The requirements for the EIS, documented as part of the SEARs
- Ongoing discussions about local conditions, local infrastructure, and various architectural and technical investigations by the consortium
- Discussions about the community engagement program, with an insistence that it is thorough and responsive to community needs

4.1.1 Results of meetings with government and senior stakeholders

The table below provides a summary of the agency and stakeholder meetings held.

AGENCY	DATE MET	ISSUES DISCUSSED
Blacktown City Council (BCC)	02/10/2019	Proposal briefing. Council questions regarding site emissions and air quality. Discussion regarding community benefits.
	12/02/2020	Meeting was to update the briefing to Council now that SEARs have been received. Discussed engagement activities in regard to the proposal. Council confirmed the activities undertaken to date were appropriate. Other quality aspects including ISO 14001 environmental certification and modular (scalable) design. Need to continue to emphasise good waste management practice and recycling. Onsite facilities to ensure an 'even' fuel supply and removal of contaminants. Community

		engagement during delivery and the importance of community investment.
	13/02/2020	Meeting to consider engineering aspects of the proposal including on site water detention, water quality on site, pollutant reduction targets, Reedy Creek and Eastern Creek flows, rainfall data. Meeting discussed the proposal's requirements for water on site, including recycling, water capture and input from Sydney Water. Overland flow paths discussed. Flood assessment to be completed. Council confirmed site does not contain remnant vegetation. Sediment and erosion control plans required. Noted that the Austral Bricks access road is located within Fairfield City Council and recommended the project meet with Council.
	16/04/2020	Briefing on the development of the architecture solution. Discussion examined the proposal; local character, potential use of mature Cumberland Plain gum trees, ongoing community liaison, improvement to the site and amenity. The council noted the importance of community considerations and the need to invest in the local community. Community issues include odour and the facility being aesthetically pleasing. Council and project team discussed the establishment of a Voluntary Planning Agreement. For the future Community Reference Group, the project to welcome participation from Council (through the Mayor or other representative), as well as the local Member of Parliament.
	07/05/2020	The design was raised no major items that affect the design direction. The Blacktown City Council Architect noted the journey of the waste trucks from the M7 Motorway and considered their movement impact on the surrounding residences and the adjoining businesses. The architect noted the approach to the landscape in the zone between the proposal and the M7 Motorway. The blade walls were agreed as a good strategy for deconstructing the volume. It was suggested that the variance in material finish between the blade walls and the interstitial spaces could be considered to ensure enough contrast. It was suggested that there could there be an opportunity to engage an artist to develop a strategy for 'artwork' on the blade walls. It was noted that a high-level build quality would be needed to ensure good façade outcomes.
Fairfield City Council	05/02/2020	Meeting to brief Council on the proposal. Questions regarding the financial and compliance items. Noted that current waste arrangements have had continual change and the outcomes were not what they were hoping for, except price. Interested in receiving proposal updates. Council will be tendering their waste management in the next few years. Interested in the project's plans to manage the ash products.

	03/04/2020	Presentation by Herman Huisman on waste management and energy-from-waste in the Netherlands and Europe. Discussion considered what local government can do to support the transition to a circular economy. Mr Huisman described Netherlands 'pay-as-you-throw' system where residents are economically incentivised to recycle. Council indicated an interest in recycling facilities (potentially moving away from collecting waste from households). Council noted high bin contamination rates, especially given the latest NSW paper is suggesting a 4-bin system.
Environment Protection Authority (EPA)	25/03/2020	Participants from the EPA were familiar with the proposal. The project provided an overview of the proposal and waste strategy to comply with the energy-from-waste policy. The EPA queried if waste could go directly to energy-from-waste without pre-sorting. The project outlined their focus on best practice source separation, and if it is done at the source then no further sorting is required. EPA understands the proposed waste strategy but needs to discuss further. EPA will discuss internally and contact the project if more information is required.
	08/04/2020	The project provided an overview of the proposal. The department questioned the calculation of CO2. The project confirmed that landfill gas capture was included. Clarified that fossil fuel emissions avoided was from coal/gas electricity generation. Discussion of the Centre's need to assume reducing community waste levels. Discussion on energy from waste as a part of Circular Economy. Questions as to what kind of contracts the project were seeking – noting the need to ensure recycling is supported. Discussion regarding the proposal need to seek a Note 1 exemption.
	30/04/2020	Briefing on energy-from-waste, flue gas treatment systems and emissions controls. EPA appreciated the opportunity to gain a better understanding of the air management system and the detail that was provided by Ramboll. The EPA questioned details on the flue gas treatment system, how fuel rates were controlled, water reuse and management of waste-water.
NSW Department of Primary Industries (DPI)	04/10/2019	Phone meeting. Cleanaway confirmed purchase of the site.
	28/05/2020 (correspondence)	The project provided NSW Department of Primary Industries with information on the project. NSW Department of Primary Industries' Biosecurity and Food Safety division responded. The project detected salmonella on the site that has been addressed in accordance with State requirements. Advice was provided that due to the property undergoing full decontamination, the risk for Salmonella Enteritidis for animals on this property is assessed as low and no further action is required in this regard. The approach proposed to manage

		biosecurity issues associated with the clearing of vegetation on the site is supported. The Department expected that the EIS will address potential biosecurity (weed, pest and pathogen) risks and management measures arising from the import and handling of the residual waste feedstock for the facility.
Environment, Energy and Science (DPIE)	26/09/2019	Discussion about the Western Sydney Parklands. Management of the parklands and planning for the Cleanaway proposal.
	10/10/2019	Discussion about the community and engagement process. Summary of all engagement leading up to announcement and post provided after the meeting.
	13/11/2019	Briefing to provide update on engagement activities.
	26/11/2019	Secretary requested the meeting to be held with the Department.
	03/04/2020	The project provided an update to DPIE regarding studies and their progress. The group discussed the team's ability to engage the community physically under the COVID 19 circumstances. Need to ensure lower socio-economic groups and older people can engage. There are concerns as to how best to engage and to keep the planning process going.
	08/04/2020	The project provided an overview of the proposal. The department questioned the calculation of CO2. The project confirmed that landfill gas capture was included. Clarified that fossil fuel emissions avoided was from coal/gas electricity generation. Discussion of the Centre's need to assume reducing community waste levels. Discussion on energy-from-waste as a part of Circular Economy. Questions as to what kind of contracts the project were seeking – noting the need to ensure recycling is supported. Discussion regarding the proposal need to seek a Note 1 exemption.
Transport for NSW (TfNSW)	14/02/2020	A proposal briefing was provided. Ownership of the road that borders the southern side of the site was confirmed. The M7 height clearance to the access road. Process to liaise with the M7 Westlink management team. Discussion regarding proposed arrangements at the Wallgrove Road Austral Bricks road intersection. Discussion regarding traffic impact assessment requirements. Parking, public transport and cyclist issues discussed.
	07/05/2020	Further discussion of the development's design and for the main findings of the Traffic Chapter to be issued as part of the EIS submission. TfNSW noted likely requirement for the provision of a 2nd exit lane from Austral bricks access road to Wallgrove Road. TfNSW requested swept path analysis of the

		junction movements and highlighted requirement for pedestrian access to enter the site. Consultation with the land owners was requested, as well as the ability to obtain their consent as part of the EIS process.
NSW Ministry of Health		Please see NSW Health notes.
Western Sydney Local Health District	04/09/2020	A proposal briefing was provided. Discussions focussed on the feedstock for the centre; the different types of waste feedstock and the Reference facility; and the health impact assessment. They endorsed the assessment approach to be undertaken by EnRisk.
Fire and Rescue NSW (FRNSW)	06/04/2020 (correspondence)	The project provided NSW Fire and Rescue with information on the project. There were no questions in relation to the information provided.
Sydney Water	29/01/2020	A proposal briefing was provided. Sydney Water is keen to explore the option of servicing the proposal's water demand using recycled water. A supply point is within 10km. Sydney Water noted that the proximity to Prospect Reservoir will need to be considered in relation to water quality impacts. Ongoing discussions regarding the assessment process would be appreciated.
Endeavour Energy	25/10/2019	Meeting discussed the potential to connect the facility to the electricity grid.
SafeWork NSW	14/05/2020 (correspondence)	A proposal briefing was provided. SafeWork raised a number of questions for the project to respond to.
	28/05/2020 (correspondence)	The project provided SafeWork with a process hazard analysis. SafeWork confirmed they had no concerns based on the information provided. They would welcome an opportunity to provide additional comments during the public exhibition period when the full PHA can be reviewed.
Western Sydney Airport Corporation (WSA Co)	14/05/2020	The project provided WSACO with information on the project. Questions were raised regarding the OLS height at 339 Wallgrove Rd Eastern Creek; how the facility would manage wildlife attraction to avoid bat and bird strikes; and how the facility would manage the stack from a safety perspective.
	28/05/2020 (correspondence)	The project provided WSACO with further information on the project in correspondence. WSACO understands that EIS will address the aviation safety and hazard issues they have identified. They clarified that there have been no PANS-OPS designs yet for Western Sydney Airport and details will not be known until the detailed airspace design is completed by the Commonwealth. The currently declared protected airspace for WSA is the Obstacle Limitation Surface. WSACO advised they will review the WSERRC EIS when it is on public display and make a formal submission.

Civil Aviation Safety Authority (CASA)	28/04/2020 (correspondence)	CASA recommended an enclosed standard plume rise assessment be conducted for planning purposes. They expect that the plume will be modelled for environmental reasons and they are happy to compare notes regarding plume height. CASA has provided an estimate for the Obstacle Limitation Surfaces. Recommended that the bird hazard aspect, including monitoring, should be included in the EIS and for the offset to the centreline to be quantified in the EIS. CASA noted that lighting/marking of the stack, location under the approach and plumes above the stack should be considered in the EIS.
Department of Agriculture, Water and Environment	6/05/2020; 13/05/2020	Correspondence on matters of national environmental significance (MNES)

Table 17 - Summary of the agency and stakeholder meetings

4.1.2 Results of additional meetings with government and senior stakeholders

Additional government agency meetings were held.

AGENCY	DATE MET	ISSUES DISCUSSED
Airservices Australia	30/04/2020 (correspondence)	The proposal has been received and the Airservices assessment has commenced, which takes approximately 6 weeks for completion.
	22/05/2020 (correspondence)	Airservices informed the project that they have no objections to the proposed plume rise at the site.
Canterbury Bankstown Council	12/03/2020	Interested in site location and interactions with local government. Interested in the proposal. Various questions on the project's views on recycling systems, changes in waste management in Victoria.
Cumberland Council	31/01/2020	Meeting to provide an overview of the proposal. Questions regarding the timeline for delivery and how that would fit with their procurement planning process.
	18/02/2020	Meeting to update Council on the proposal. Questions regarding the planning process and clarification of the grounds for refusal for the Next Generation proposal. The Council indicated they would like to follow the planning process and to see the WSERRC environmental assessment documents. Will be going to tender for Council's waste in the future.
Hawkesbury Council	26/03/2020	The project provided an overview of the proposal. Hawkesbury have their own landfill with limited lifespan and are considering their options for future

		waste management. The Council were interested in FOGO and keen to think about the timing of the WSERRC project. Asked about the impact of the Dial-a-Dump proposal on our experience with community engagement. Happy to continue to engage and consider things like FOGO.
Liverpool City Council	03/03/2020	Brief presentation to the council on the proposal. Councillors have visited an energy-from-waste facility in Japan. Councillors asked about WSERRC operations and environmental topics and the project provided responses. Invited Councillors to send through any further questions.
Parramatta City Council	07/11/2019	Meeting to brief Council on the proposal. Discussed the possibility of future waste management procurement with the City of Parramatta Council.
	20/02/2020	Meeting to brief Council on the proposal. This is the second meeting with Council since 2019. Council note a waste tender process is scheduled for early to mid-next year. Discussion focussed on period of flexibility required, for the 2022-2024 period. Council viewed the project's approach to community as being different to that of other energy-from-waste applicants; supportive of this approach to stakeholders. CO2 emission reduction is a strong focus for Council, currently 5% of their emissions comes from waste. The goals from their Environmental Sustainability Strategy: Carbon neutral by 2022; 60% emissions reduction by 2038 (based on 2015 levels).
Penrith City Council	05/03/2020	A general proposal overview provided. Penrith have had FOGO for 12 years. Penrith have energy-from-waste as part of their waste management strategy. Residual waste disposal contract – recently signed 10-year contract from 2019 until 2029. Asked questions about the feedstock alignment with the Dublin reference proposal.
The Hills Council	27/02/2020	A proposal briefing was provided. Interested in energy-from-waste as a next step in waste management. Council is meeting the NSW Government to discuss energy-from-waste, waste strategy and policy. Complimentary of the proposal's community and stakeholder engagement activities. Confirmed the proposal location has good reasoning. Council's disposal contract expires in 2022, with a 5-year option at Council's discretion.
WaterNSW	20/03/2020	A proposal briefing was provided. Discussed potential site access options, including bridges over

		the Warragamba Pipeline. WaterNSW highlighted need to minimise risk to pipeline and the need have access for works done. The project is exploring options to mitigate risks to pipelines.
	10/06/2020 – 12/06/2020 (correspondence)	Email correspondence focused on the site location, WSERRC project discussions with adjacent landowners and government departments, intended access strategy and a risk assessment required for WaterNSW assets. A Technical Paper on Risk Assessment was prepared for consultation with WaterNSW.
Western Sydney Parklands Trust (WSPT)	09/09/2019	The project provided Western Sydney Parklands Trust with information on the project.
	22/05/2020	A proposal briefing was provided. The Western Sydney Parklands Trust did not suggest changes to the living green walls, visitors centre and access aspects of the proposal. They noted the proposal aligns with the Western Sydney Parklands Trust strategic directions from their 2030 plan. They requested information regarding feedback from the community, as well as details surrounding the Community Investment Package. They noted that the facility would align with zoning and the future of the parklands. The project advised Western Sydney Parklands Trust that they will likely be requested to provide input and feedback on the EIS.
Wollondilly Council	17/03/2020	A proposal briefing was provided. The project offered a second briefing if useful and for councillors to send through any questions.

Table 18 - Other stakeholder meetings

4.1.2 Other stakeholder meetings

Engagement objectives contributed to:

The table below provides a summary of stakeholder meetings that were held in addition to those listed in the SEARs.

AGENCY	DATE MET	ISSUES DISCUSSED
Blacktown & District Environmental Group representative	14/01/2020	Meeting to provide a brief on the proposal. Agreed that the participation of the community group is not to be noted as support for the proposal. Proposal issues include adherence to State/EPA air standards, community health, data transparency for the proposal, ash reuse options and investigations, how this proposal fits with the circular economy concepts, community need for information and discussions regarding air and health aspects.
Committee for Sydney	11/02/2020	Deputy Chief Executive Eamon Waterford was briefed by the consortium on 11 February 2020. Discussion focussed on waste stream diversion options and opportunities for use of WSERRC's proposed technology in other plants in Sydney.
Dr Hugh McDermott, MP, NSW Member for Prospect	03/10/2019	Provided general proposal information during an office stop by.
	18/10/2019	Proposal briefing was provided. The Member noted he had researched and was familiar with the technology. Questioned the community engagement process.
	9/11/2019	Dr McDermott attended the community workshop and opened the proceedings. He spoke about the opportunity for those present to ask questions and express their concerns fully; so that answers can be sought.
Indigenous groups: A1 Indigenous Services, Deerubbin Local Aboriginal Land Council Aragung Aboriginal Cultural Heritage Site Assessments Barking Owl Aboriginal Corporation Barraby Cultural Services	27/03/2020	Aboriginal people who hold knowledge relevant to determining the cultural heritage significance of Aboriginal objects and Aboriginal places in the area in which the proposed activity was to occur were invited to register an interest in a process of community consultation. The proposed cultural heritage assessment methodology was provided to 25 Aboriginal community individuals and stakeholders for a 28-day review and comment period.

Biamanga Butucarbin Aboriginal Corporation Darug Custodian Aboriginal Corporation Dharug Ngurra Aboriginal Corporation Dhinawan Culture and Heritage Didge Ngunawal Clan Goodradigbee Cultural & Heritage Aboriginal Corporation Kamilaroi Yankuntjatjara Working Group Merrigarn Muragadi Heritage Indigenous Corporation Murra Bidgee Mullangari Aboriginal Corporation Murramarang Ngambaa Cultural Connections Tocomwall Waawaar Awaa Aboriginal Corporation Widescope Indigenous Group Yulay Cultural Services Yurrandaali		Formal responses were received from the stakeholders.
Office of the Minister for Energy and Environment	12/07/2019	Proposal briefing was provided. Participants questioned the level and role of social licence for an energy-from-waste plant in the Sydney region. Understands energy-from-waste is a proven technology globally and in widespread use. Wants to ensure NSW has best available technology for such a centre. Notes that Cleanaway as an organisation has good standing in the industry.
Mr Anoulack Chanthivong Member, Legislative Assembly Committee on Environment and Planning	17/10/2019	Proposal briefing was provided. The Member noted he had researched and was familiar with the technology. Questioned the community engagement process.

Ms Kate Washington MP, Shadow Minister for Environment and Heritage	11/03/2020	Keen to understand the types of waste that would go to energy-from-waste. Interested in the location and the selection process. Interested in the technology and what is used overseas / what is similar. Recognised stakeholder engagement is critical. Ms Washington was aware of The Next Generation proposal.
Ms Tanya Davies, MP NSW Member for Mulgoa	05/11/2019	Proposal briefing was provided. Questioned the community engagement process.
	20/11/2019	Meeting to provide initial briefing on the proposal.
NSW Chief Scientist & Engineer, with Herman Huisman	31/03/2020	Herman Huisman provided a presentation on energy-from-waste in The Netherlands.
NSW Department of Premier and Cabinet	1/11/2019	A proposal briefing was provided. Questions raised regarding the community engagement process and emphasis on importance of this.
Planet Ark	01/10/2019	Proposal briefing.
Western Sydney Leadership Dialogue (WSLD)	02/10/2019	Briefed by telephone by Newgate. Discussion focussed on planning approval pathway and use of proven, world's best technology.
	14/10/2019	WSLD stated they were not aware of the proposal following the announcement and that they would like to receive further information.
Western Sydney University	24/01/2020	A proposal briefing was provided. The University expressed interest in partnering with the proposal on various aspects. Agreed to hold a further session to follow up with senior staff.
	05/03/2020	Discussions on potential collaboration topics including bottom ash. Fit with NSW Circular Economy network and funding. Scoping possible research collaboration. Difficulty in commercialising. Demonstrate Australian MSW and C&I and associated IBA appropriate use, specification, safety etc. Best pathway/use and exemption approval pathway.

Table 19 - Other stakeholder meetings

4.1.3 Engagement with businesses

Objective/s contributed to

The table below provides a summary of the business meetings held.

AGENCY	DATE MET	ISSUES DISCUSSED
Austral Bricks	28/02/2020	General proposal briefing. Discussed access to the site and a potential new access point further east. Discussed potential synergies between the proposal and Austral Bricks operations.
Better Burn Firewood	03/10/2019	Door knocked on 3 October 2109 by the project; and provided with the brochure information and contact details.
Boral Cement Works	20/05/2019	Boral recommended the possible use of the Berrima Cement Kiln for ash reuse. Agreed to further meeting with Boral, Cleanaway and ARUP to discuss kiln synergies further.
Canberra Data Centre	20/02/2020	Meeting to brief the data centre on the proposal. Centre has green/renewable development objectives. Baseload, reliable power is extremely important. Construction on the first centre has commenced. Current load is ~25MW. Developing another 4 data centres on their site. Invited to stay in touch and provide updates in regard to proposal approvals.
Gazcorp	27/05/2020	The project provided Gazcorp with an update on the proposal. Gazcorp sought information on the site zoning; if energy-from-waste fits within the zoning; the relevant local government authority; and adjoining sites and land uses. There was discussion regarding power offtake and heat production from the proposal. Gazcorp advised the project that they are seeking approval to build under WaterNSW Warragamba pipeline for their sewer. They advised there is detailed design underway for a new intersection on Wallgrove Road. Gazcorp advised they will review the WSERRC EIS when it is on public display.
Little Grace's Child Care Centre	03/10/2019	During the proposal announcement door knocking, a member from the project visited the Little Graces Childcare Centre. No main issues were raised. Neutral to positive sentiment. They were thankful for the update and will pass on material and invitation to meet to owner. Possible meeting with owner and/ or parents.
NBN	18/03/2020	Fibre to the premises (FTTP) connection. Consultation with NBN has confirmed that an FTTP connection is feasible.
SUEZ	26/02/2020	General exchange on respective energy-from-waste projects and development of a market for ash re-use.
Sydney Zoo	15/01/2020	Meeting to brief on the proposal. Sydney Zoo noted the importance of air quality information. Requested further information on the management of odour.
Transgrid	20/05/2020	Transgrid provided an overview of their business. The project team provided Transgrid an overview of the WSERRC. The potential for Transgrid to assist with the grid connection was discussed. The WSERRC project team to provide Transgrid with high level project information including site layout and

		electricity generation profile. Transgrid to follow up with any advice on connection proposals and possible next steps.
Westlink M7	28/02/2020	The project provided a briefing on the proposal. The project team noted the need for new electrical, telecommunications, potable water and sewer connections to the site. These utilities will need to cross the M7 Motorway and options were discussed. Information from WestLink M7 was requested including; details of cross-drainage culverts, M7 drainage adjacent to the western boundary of 339 Wallgrove Road and retaining wall details at the south west of the WSERRC site. WestLink M7 noted that site lighting should consider any potential impact on motorists. They also discussed the possible need for the project to enter a bond or commercial agreement relating to the retaining wall at the south west of the site as security in regards to any potential damage during construction.
Western Sydney Business Chamber and Sydney Business Chamber	01/10/2019	Meeting focussed on planning approval pathway, technology already proven overseas to be adopted by WSERRC and consultation with the community.

Table 20 - Meetings with businesses

4.2 COMMUNITY AND STAKEHOLDER FEEDBACK

The community and stakeholder engagement activities provided opportunities for the project to open a dialogue, receive and respond to comments and feedback, and better understand sentiment. Comments and feedback received during the proposal's engagement activities (*Section 3*) have been collected and collated into six topic areas – technical, environmental, operational, community and social, financial and process.

The comments and feedback received have helped the project understand the community's information needs to be addressed during the WSERRC EIS. Issues were summarised under the categories as follows.

Project need and location: • The need for the proposal • Site selection	**Waste management:** • Best practice in waste management • Recycling • Resource recovery prior to combustion • Reducing waste	**Operational:** • Electrical generation process • Heat & Steam • Heat • Residual ash management • Water use in the EfW facility • Wastewater management • Timeframe for operations • Timeframe for approvals • How long will the plant operate for?
Environment issues: • Air quality assessment and compliance with international best practice/regulations in relation to air quality and health • Carbon emissions and climate change • Hazardous materials • Fire • Cumulative impacts • Potential interference with aviation • Air quality during a bush fire? • Impacts on biodiversity • Meteorology • Landfill emissions comparison • Emissions monitoring and testing • Flue Gas Treatment • Human health impact	**Environment issues cont.:** • What is the human health impact of the proposal? • Noise impact • Traffic impact • Visual amenity • Impacts on Drinking Water • Site licence, measuring and reporting • Site auditing, breaches, incidents	**Community and social issues:** • Community benefit • Employment • Community involvement

Table 21 – Issues categories

The comments and feedback received have helped the project understand the community's information needs to be addressed during the WSERRC EIS. *Appendix B* contains a summary of issues and concerns raised by stakeholders and the community.

The table below summarises the key issues raised.

ISSUE OR QUESTION CATEGORY
PROJECT NEED AND LOCATION
The need for the proposal Explain the need for the proposal and how it compares to landfill. If the Next Generation EfW project proceeds (currently before the NSW Land and Environment Court), will this remove the need for WSERRC?
Site selection Explain the site selection process and how this site was selected
WASTE MANAGEMENT
Best practice in waste management How does the proposal fit within a context of best practice in waste management?
Recycling Will EfW remove the need for recycling?
Resource recovery prior to combustion Describe the waste feedstock and what level of pre-sorting and recycling takes places before being sent to the facility? If materials are combusted that are not meant to be in the red bin; what happens to air quality?
Reducing waste There should be a focus on reducing waste and encouraging recycling, not establishing EfW
OPERATIONAL
Electrical generation process What is the process of energy generation at the facility?
Heat Will the proposal emit heat and if so, will it impact surrounding communities?
Heat and steam Can the heat and steam that is produced also be re-used?
Residual ash management What are the by-products of the EfW process, how are they managed and can the by re-used?
Water use in the EfW facility What is the role of water in the EfW process and how it is managed to avoid any off-site impacts?
Timeframe for operations How many hours a day will the facility operate?
Timeframe for approvals

ISSUE OR QUESTION CATEGORY
What is the timeframe from approval to operation?
How long will the plant operate for? How long is the approval for the proposal, and what happens to the facility after that period?
ENVIRONMENTAL
Air quality assessment and compliance with international best practice/regulations in relation to air quality and health How does the proposal meet international standards for EfW technology, air quality and health? Explain the approach to and outcomes of the air quality assessment and how it performs against impact assessment criteria and international standards
Carbon emissions and climate change What are the CO_2 reduction benefits?
Hazardous materials How are dangerous goods managed on site?
Fire How is fire risk managed onsite? Is the facility at risk from a bush fire?
Cumulative impacts Has the proposal assessed potential cumulative impacts with other proposals?
Potential interference with aviation How was potential impact on the protected airspace of Western Sydney Airport assessed?
Air quality during a bush fire? What impact does the proposal have on air quality during a bushfire?
Impacts on biodiversity How will the flora and fauna be impacted by the proposal?
Meteorology How is data on meteorological condition used in the air quality assessment?
Landfill emissions comparison What is the equivalent amount of emissions and pollutants compared to landfill?
Emissions monitoring and testing How will emissions from the facility be monitored?
Flue gas treatment What is the emissions treatment process, including back up procedures if any part of the process fails?
Human health impact What community health data is available?
What is the human health impact of the proposal?
Noise impact What are the potential noise impacts from the proposal?
Traffic impact What are the potential traffic impacts from the proposal?
Visual amenity

ISSUE OR QUESTION CATEGORY
What will the proposal look like and what are the potential visual impacts?
Impacts on Drinking Water What is the potential impact to Sydney's drinking water supply, Prospect Reservoir and domestic water supplies such as rainwater tanks/dams?
Site licence, measuring and reporting Describe how the environmental performance of the site will be regulated and monitored.
Site auditing, breaches, incidents Describe the process for detecting and responding to potential exceedances of regulated criteria and how information on exceedances will be reported?
COMMUNITY AND SOCIAL ISSUES
Community benefits and impacts How have impacts on the community been avoided and what benefits will the community get from the proposal?
Employment What number and type of jobs will be generated by the proposal? Construction and operation.
Community involvement Explain the community consultation process to date, issues raised, how these issues have been addressed, and plans for ongoing consultation.

Table 22 – Community stakeholder issues raised and where this is addressed in the EIS

4.4 ENGAGEMENT ACTIVITY OUTCOMES

4.4.1 Summary of the investment in engagement

The commitment from the project was to engage widely, across a number of different forums, with diverse audiences, to seek a range of perspectives on the proposal.

Figure 23 - WSERRC engagement activities

There has been a large-scale investment in community and stakeholder conversations.

- Approximately 46 meetings or detailed exchange of correspondence with government agencies; 20 with other groups; and 14 with businesses and business groups have been held.
- Approximately 237 person hours undertook the door knocking to over 3000 homes, some 100 project proposal team hours working with the Air and Health Citizens' Panel participants; and over 135 project team hours of conversation at local pop-up information stands.
- Responding to community questions, rather than waiting until the EIS was published, was considered to be important by the project. Over 350 individual, written responses have been provided to community members with the information already obtained by the project.

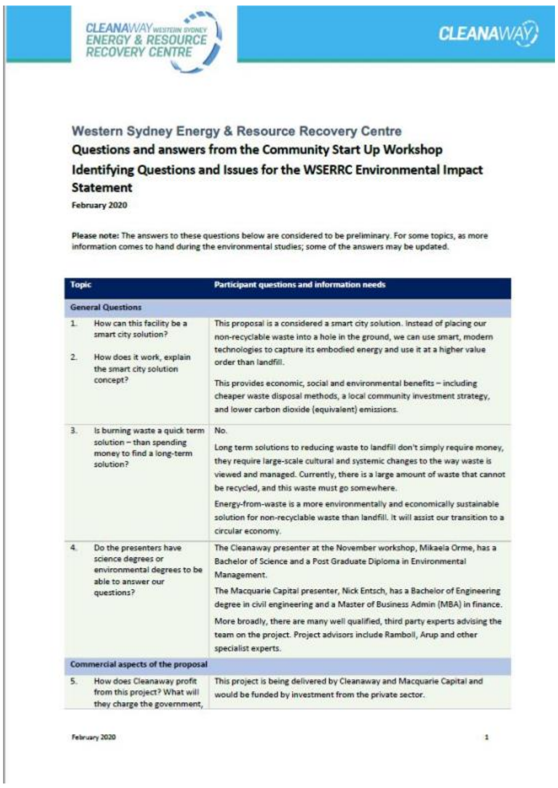
4.4.2 Responding to community questions

The project team received many questions along the communications journey. The aim of the project was to answer as many questions as possible, during various discussions, whilst noting that the environmental impact statement studies would also contain some of the answers that participants were seeking.

Nonetheless, extensive written responses were provided:

- as part of the initial question and answer document on the proposal website;
- to emailed questions and questions taken on notice during the door knocking and shopping centre pop-ups;
- in response to questions recorded in the community start-up workshop in November 2019 (provided to participants in March 2020);
- to social media posts containing questions that were directed to Cleanaway;
- as part of the Air and Health Citizens' Panel process and the preparation of meeting summaries; and
- as part of the questions raised out of session by participant members.

At least 350 individual, written responses have been provided to community members. For example, Figure 25 below shows a document that followed up on a wide range of questions raised in the November 2019 start-up community workshop.



CLEANAWAY WESTERN SYDNEY ENERGY & RESOURCE RECOVERY CENTRE

CLEANAWAY

Western Sydney Energy & Resource Recovery Centre

Questions and answers from the Community Start Up Workshop

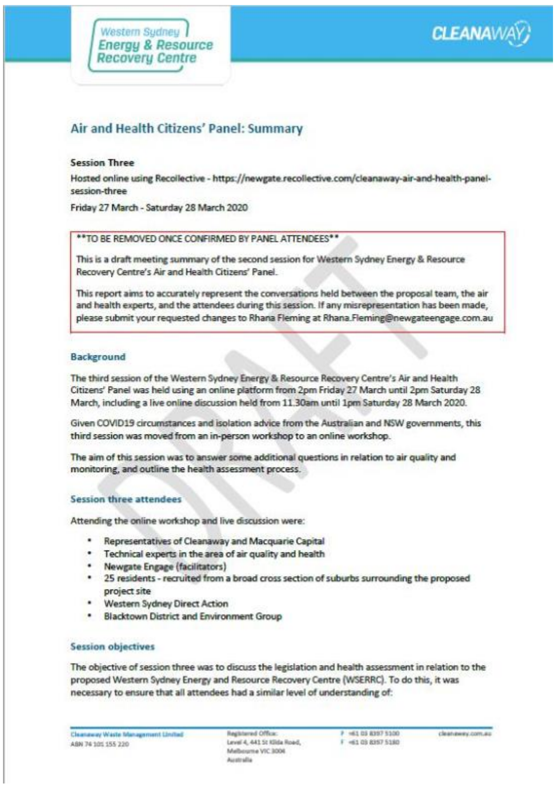
Identifying Questions and Issues for the WSERRC Environmental Impact Statement

February 2020

Please note: The answers to these questions below are considered to be preliminary. For some topics, as more information comes to hand during the environmental studies; some of the answers may be updated.

Topic	Participant questions and information needs
General Questions	
1. How can this facility be a smart city solution? 2. How does it work, explain the smart city solution concept?	This proposal is a considered a smart city solution. Instead of placing our non-recyclable waste into a hole in the ground, we can use smart, modern technologies to capture its embodied energy and use it at a higher value order than landfill. This provides economic, social and environmental benefits – including cheaper waste disposal methods, a local community investment strategy, and lower carbon dioxide (equivalent) emissions.
3. Is burning waste a quick term solution – than spending money to find a long-term solution?	No. Long term solutions to reducing waste to landfill don't simply require money, they require large-scale cultural and systemic changes to the way waste is viewed and managed. Currently, there is a large amount of waste that cannot be recycled, and this waste must go somewhere. Energy-from-waste is a more environmentally and economically sustainable solution for non-recyclable waste than landfill. It will assist our transition to a circular economy.
4. Do the presenters have science degrees or environmental degrees to be able to answer our questions?	The Cleanaway presenter at the November workshop, Mikaela Orme, has a Bachelor of Science and a Post Graduate Diploma in Environmental Management. The Macquarie Capital presenter, Nick Entsch, has a Bachelor of Engineering degree in civil engineering and a Master of Business Admin (MBA) in finance. More broadly, there are many well qualified, third party experts advising the team on the project. Project advisors include Ramboll, Arup and other specialist experts.
Commercial aspects of the proposal	
5. How does Cleanaway profit from this project? What will they charge the government,	This project is being delivered by Cleanaway and Macquarie Capital and would be funded by investment from the private sector.

February 2020 1



Western Sydney Energy & Resource Recovery Centre

CLEANAWAY

Air and Health Citizens' Panel: Summary

Session Three

Hosted online using Recollective - https://newgate.recollective.com/cleanaway-air-and-health-panel-session-three

Friday 27 March - Saturday 28 March 2020

TO BE REMOVED ONCE CONFIRMED BY PANEL ATTENDEES

This is a draft meeting summary of the second session for Western Sydney Energy & Resource Recovery Centre's Air and Health Citizens' Panel.

This report aims to accurately represent the conversations held between the proposal team, the air and health experts, and the attendees during this session. If any misrepresentation has been made, please submit your requested changes to Rhana Fleming at Rhana.Fleming@newgateengage.com.au

Background

The third session of the Western Sydney Energy & Resource Recovery Centre's Air and Health Citizens' Panel was held using an online platform from 2pm Friday 27 March until 2pm Saturday 28 March, including a live online discussion held from 11.30am until 1pm Saturday 28 March 2020.

Given COVID19 circumstances and isolation advice from the Australian and NSW governments, this third session was moved from an in-person workshop to an online workshop.

The aim of this session was to answer some additional questions in relation to air quality and monitoring, and outline the health assessment process.

Session three attendees

Attending the online workshop and live discussion were:

- Representatives of Cleanaway and Macquarie Capital
- Technical experts in the area of air quality and health
- Newgate Engage (facilitators)
- 25 residents - recruited from a broad cross section of suburbs surrounding the proposed project site
- Western Sydney Direct Action
- Blacktown District and Environment Group

Session objectives

The objective of session three was to discuss the legislation and health assessment in relation to the proposed Western Sydney Energy and Resource Recovery Centre (WSERRC). To do this, it was necessary to ensure that all attendees had a similar level of understanding of:

Cleanaway Waste Management Limited ABN 74 101 155 220 Registered Office: Level 4, 441 St Kilda Road, Melbourne VIC 3004 Australia P +61 03 8397 5100 F +61 03 8397 5180 cleanaway.com.au

Figure 24 – Pages from the March 2020 Q&A document sent out to November workshop attendees

4.5 COMMUNITY BENEFITS OF THE FACILITY

This section responds to the SEARs requirement to '*Demonstrate the community benefits of the facility, including details of similar facilities which are operating around the world including testimonies from their regulating offices and contact details'.*

4.5.1 Community benefits of the proposal

Deloitte was engaged to independently identify and quantify the public benefits and costs of the proposed Western Sydney Energy and Resource Recovery Centre (WSERRC) accruing to communities, business and the environment in Western Sydney and, more broadly NSW. The economic assessment concluded that the proposal would return a total net public benefit of more than $500 million over the period 2025 through to 2040, with the Western Sydney region receiving most of the benefit.

The economic benefits of the WSERRC are primarily achieved through avoiding the negative externalities of landfill, reduced cost of disposal of non-recyclable waste, reduced cost of generating electricity, and increasing opportunity for local employment. The details of the analysis are summarised below.

Jobs creation

During the three-year construction period, it is expected that the WSERRC will directly employ some 800 workers. Additionally, there will be at least 50 full-time equivalent jobs created for Western Sydney to operate this facility to the end of 2040.

Lower electricity prices

The Centre is expected to generate approximately 45MW of electricity a year.

It is estimated that wholesale electricity prices (and thus retail prices) will be lower as a result of the WSERRC operating from 2025 onwards. This is expected to benefit New South Wales energy with a saving of $119 million in present value terms.

The estimated electricity cost saving arises as the WSERRC is expected to displace energy generation from the existing coal and gas generators. This is because it is assumed to have a lower marginal cost of electricity production, allowing it to bid into the National Energy Market at a lower cost to meet the last demand unit of electricity.

This will result in a lower total marginal cost of electricity generation for New South Wales, leading to a cost saving for households. This saving increases non-uniformly between 2025 and 2040 due to a different expected generation mix in each year modelled.

Reducing emissions

The WSERRC is expected to generate lower energy sector emissions.

As the WSERRC displaces thermal energy generation (coal or gas) it delivers an incremental CO_2e saving. That is, the generation of thermal energy is more carbon intensive than the generation of energy from energy-from-waste.

Energy-from-waste emissions savings are the avoided emissions from thermal generation displaced (coal and gas) minus the emissions from the WSERRC (post a biogenic offset).

The value of emissions saved from the proposal totals $60.6 million (discounted at 7%) for the period 2025 to 2040.

Reducing the cost of landfill

The Centre is expected to lower the cost of waste collection and disposal services for councils by changing the structure of gate fees charged to local councils.

When waste is sent to landfill, a gate fee of $156.4 per tonnes (excluding the landfill levy of $143.6 per tonne) is charged to local governments. With 500,000 tonnes of waste disposed to landfill, this equates to a cost of $78 million per annum to local councils.

If a gate fee of $150 per tonne is charged for waste received by the WSERRC, the cost savings for local councils is expected to be around $6.4 per tonne or $3.2 million per annum, with a total avoided cost of $23.1 million for the reporting period FY2025 through to FY2040.

The construction of the proposal would avoid other externalities associated with landfill waste, including landfill leachate, greenhouse gas and other gasses, impacts on local roads from transporting landfill. This is estimated to have a total net present value of $350m for the period to 2040.

4.5.2 Community funding package

If the WSERRC proposal is approved, the applicant proposes to establish a community funding package for Western Sydney, with the purpose being to give back to the community. Funding contributions would total $150,000 per year and, subject to consultation a4nd a decision by the community reference group (CRG, See Appendix C), could be made towards community-based initiatives such as the development of local sporting infrastructure, community facilities and environmental areas such as tree plantings.

4.5.3 Details of similar facilities operating around the world

Several examples from around the world are provided below. This information is also on the project website at https://energyandresourcecentre.com.au/

NAME	IMAGE	COMMUNITY BENEFITS
The Dublin Energy from Waste facility, Ireland (Covanta)		• During construction over 300 jobs were created with more than 50 from the local area. Over 100 positions operate the facility. • Through community-based programs, the centre works with a variety of organizations on local environmental issues. • The facility-run initiatives enlist volunteers to help clean up rivers, streets and parks. Also at a local level, the centre supports food pantries, recycling programs, and sports teams.
Duiven Energy from Waste plant, The Netherlands		• The Duiven facility works with industry partners, organisations and authorities to generate awareness and strive for positive change on managing waste. • The facility supplies recycled CO_2 to nearby farming communities, which means they don’t need to burn natural gases to produce the CO_2 they need for horticulture. • This creates savings on fossil fuels. The captured CO_2 is used by farmers to grow vegetables, soft fruit, flowers and other plants.

Lakeside Energy from Waste Centre, London		• The Lakeside Energy from Waste facility helps its customers to meet their landfill diversion targets and avoid the rising costs of Landfill Tax. • There is an education centre adjacent to the Lakeside Energy from Waste facility, where schools and other groups learn about sustainable waste management and energy from waste.
Kwinana Energy from Waste, Perth Australia		• Avertas Energy will deliver a range of benefits to the local community, the regional economy and the metropolitan environment. This includes creating 800 local jobs during construction and then 60 jobs to operate the centre. • The facility has an educational centre, for community information on smart waste reduction, energy from waste processes, and best waste management methods and practices.
The Leeds Recycling & Energy Recovery Facility, England		• This facility works with its local council - Leeds City - to provide educational tours. It has a visitors centre on-site and provides schools and higher education students a waste education program focusing on waste minimisation and recycling activities. • The Leeds Community Benefit Fund helps to support local initiatives and has provided grants to the local community each year since 2016.
Amager Bakke, Denmark		• Copenhagen's citizens receive reduced cost and sustainable electricity, district heating and recycled materials. • The facility's roof has been designed as a public park space and operates as an artificial ski slope in winter and an activity park in summer, providing visitors with hiking trails, playgrounds fitness structures, climbing walls, trail running and more.
The Sysav Energy-from-waste Facility in Malmo, Sweden		• Waste that comes into the plant is sorted and recycled. The recycling centre has an educational focus and Sysav has had more than two million visits to its recycling centres across Sweden. • Almost 3,100 community members participated in study tours of the facilities in 2017 and over 3,000 school students.

	• The site operations team collaborates with regional universities and colleges on energy and waste research projects.

Table 23 – Community benefits of international facilities

4.5.4 Testimonies from their regulating offices and contact details

The Dublin Energy from Waste facility, Ireland (Covanta)

The Dublin Waste-to-Energy project is a Public Private Partnership (PPP) between Dublin City Council (acting on behalf of the four Dublin Local Authorities) and Covanta, a world leader in providing sustainable waste and energy solutions, to provide a sustainable treatment of waste that cannot be reused or recycled.

The Dublin Energy from Waste project site provides detail on the facility, outlines community funding package and publishes emissions performance as close to real time as possible. The project site can be found here: https://www.dublinwastetoenergy.ie/

The Dublin site recognises the importance of being part of the wider community and have established a community gain fund that will have positive impacts on our neighbours. More than €10 million has been made available for local groups and organisations to date with details found here: https://www.dublinwastetoenergy.ie/Community-Engagement/Community-Gain-Fund

Dublin City Council has produced a number of media statements in relation to the Dublin Waste-to-Energy facility with regard to their ongoing partnership:

- The role waste-to-energy will play in their waste management strategy:
    - http://www.dublincity.ie/main-menu-services-press-and-news-read-press-release-press-releases-2012-press-releases-july-2012-8
- Agreement on commercial arrangements:
    - http://www.dublincity.ie/main-menu-services-press-and-news-read-press-release-press-releases-2012-press-releases-march-201-10
- Reporting on the projects progress:
    - http://www.dublincity.ie/main-menu-services-press-and-news-read-press-release-press-releases-2012-press-releases-august-201-4

The EPA has similarly produced a number of documents, some regulatory, in relation to the Dublin facility.

- Licence details:
    - http://www.epa.ie/terminalfour/waste/waste-view.jsp?regno=W0232-01
- Environmental impact statement:
    - http://www.epa.ie/licences/lic_eDMS/090151b2800fa224.pdf

5. CONCLUSIONS AND ONGOING ENGAGEMENT

5.1 CONCLUSIONS FROM THE ENGAGEMENT PROCESS

5.1.1 Did we meet the engagement objectives?

The community and stakeholder engagement process met the engagement objectives:

Information - Provide information about the Western Sydney Energy and Resource Recovery Centre (WSERRC) that is comprehensive, accessible and trustworthy

Feedback – Actively seek and respond to community and stakeholder views

EIS process - Clearly explain the EIS process and opportunities for community and stakeholder engagement throughout the process

Two-way consultation - Exchange detailed information from technical investigations through discussions with community and stakeholders

Overall, the demand for direct community participation was relatively low. A range of briefing requests to community groups and stakeholders were responded to as not being required. It is our conclusion that the early proposal information that was provided satisfied a number of people.

The project responded to the relatively low number of direct contacts by

- boosting online adverts;
- undertaking door knocking and shopping centre pop-ups to reach more people; and
- continuing advertisements in local papers.

Using recruitment techniques to ensure participation from a range of local community members, the WSERRC consortium formed an Air and Health Citizens' Panel and had deep discussions on the issues of air and health, and associated topics such as risk, incident management, choice of location and cumulative impacts.

These tools were effective in providing a strong list of issues or concerns for the EIS team to make sure they addressed.

5.1.2 Changes to the proposal as a result of community and stakeholder engagement

The engagement process

As demonstrated in Section 3; the project listened to community and stakeholder suggestions regarding the consultation process itself. The community research; start-up community workshop; and process suggestions from others including Blacktown Council all helped to define the engagement.

For example, it was suggested that having an independent technical advisor would assist community groups and members of the community to trust the information provided. During the Air and Health Citizens' Panel – independent experts were asked to attend different sessions to cross examine the information being presented to the community.

Proposal design changes that have occurred in response to community and stakeholder engagement

The project has taken on board community and stakeholder issues in the design of the project in a number of ways:

- The consideration of alternative sites – extensive discussions with government agencies to consider different sites and the benefits or constraints of each site
- The engagement process – with several agencies examining the process of community and stakeholder engagement
- The development of the site architecture – with input by Blacktown Council
- The development of community funding package - with input by Blacktown Council
- Synergies with nearby industries – discussions to consider ways to work collaboratively with nearby industries
- Consideration of the emissions management system – the Air and Health Citizens' Panel holding detailed discussions on the emissions management systems. The flue gas treatment system has been designed so as to respond to community concerns.

For more information, refer to the EIS Section 2.6 of Chapter 2 Strategic Context which outlines the consideration of alternatives.

The development of the Centre's architecture

Stakeholder consultation to-date

During early research with community stakeholders, the architecture of the proposed WSERRC was not identified as a priority topic for consultation. Furthermore, engagement with community in the months prior to the exhibition of the EIS has not resulted in concerns being raised around design of the facility or the height of the stack.

Blacktown City Council, a key stakeholder, raised architecture as a concern during early engagement. The Council was briefed by the proposal architect on the facility's design and indicated that overall, they were satisfied with the approach. Council provided further refinement regarding bike path views; the potential use of mature Cumberland Plain gum tress and ongoing engagement.

A meeting on 7 May 2020 considered further refinements, including the concept of an artwork strategy. The blade walls were praised as a good strategy for deconstructing the volume. It was suggested that the variance in material finish between the blade walls and the interstitial spaces should be considered to ensure enough contrast. Size, scale and position of the signage should be sensitive to the building and the site.

Ongoing engagement

Following a positive response from Blacktown City Council on the early architectural design, an informative video presentation has been developed for the proposal website. This video describes the design process taken – the alternatives considered and the evolution of the current design, with the goal of informing the community.

A consultation process on the facility design will be undertaken with community stakeholders post-EIS. This consultation will likely take place during the construction phase of the project and seek collaboration through the Community Reference Group.

Potential design aspects for consideration will include the design of the Visitor and Education Centre, landscaping, use of green walls, and the materials used.

To view the architecture video posted on the WSERRC website, scan the QR code on the right.

5.2 COMMUNITY CONSULTATION DURING THE EIS EXHIBITION

The project is considering consultation activities to support the EIS exhibition, mindful of the engagement tools the community think are important.

During the COVID19 circumstances, the online tools in particular will be important to continue to meet the engagement objectives.

Tool to accompany the EIS exhibition are described below.

OBJECTIVES	ENGAGEMENT TOOL	ACTIVITIES
	Print, TV, Radio media Social media	• Media release by WSERRC consortium • Social media posts • Boosted social advertisements, pointing readers to the website
	EIS Summary brochure	• To describe the proposal, the community and stakeholder engagement undertaken and the EIS results – available at in-person activities and at Blacktown and Fairfield Council information desk
	Information to the database of people interested in the proposal	• Email out to the proposal database noting the EIS exhibition has commenced and how to make a submission
	WSERRC Website	Updated to describe EIS studies and the results and include: • EIS document and summary tools • information on the EIS process
	The WSERRC Air and Health Citizens' Panel	• Invite the Citizens' Panel to a question and answer session on the air and health study results (likely be an online forum)
	Blacktown Radio - SWR Triple 9 FM	• Seek an interview with the radio station; to provide community information about the proposal and EIS studies

Table 24 - EIS Exhibition proposed engagement tools

5.3 COMMITMENT TO ONGOING COMMUNITY ENGAGEMENT

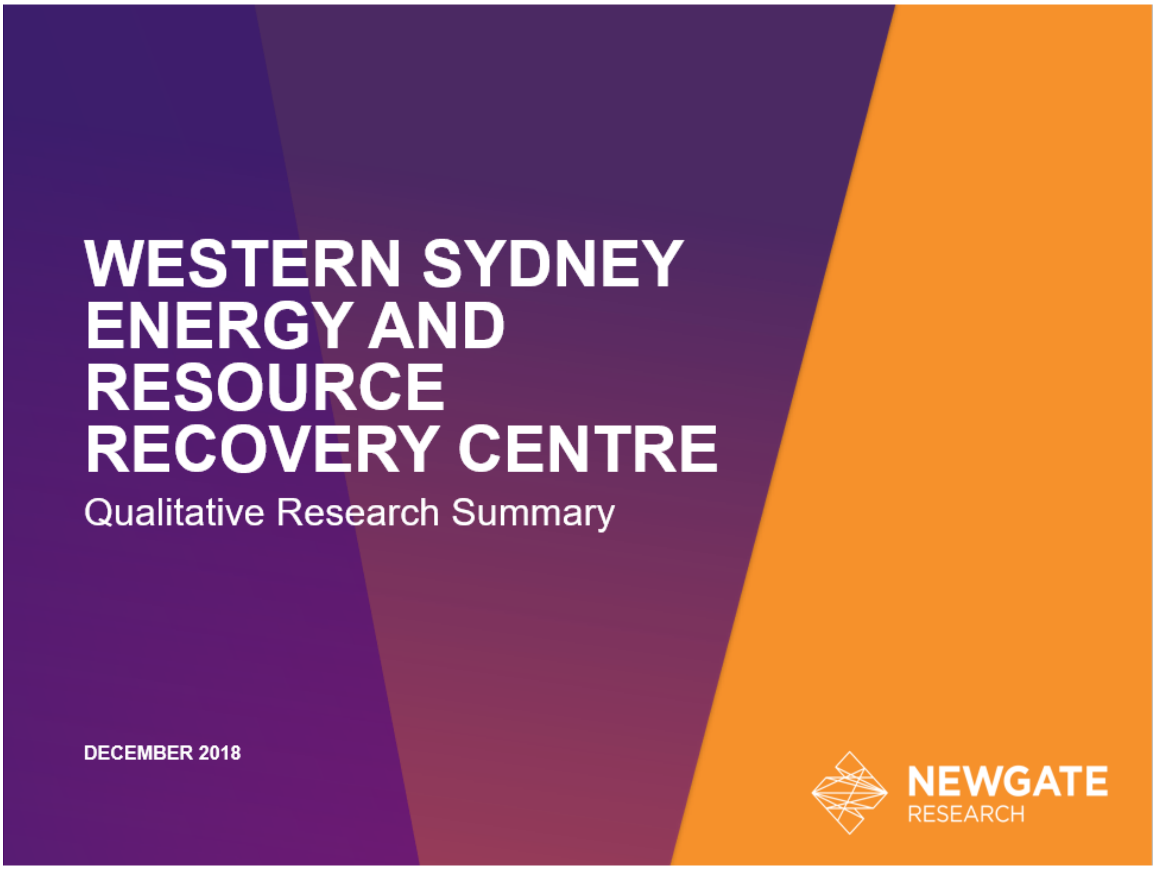
Should the proposal receive approval; the project commit to ongoing communication and engagement activities. The details of engagement activities would be confirmed post project approval, therefore the following is a guide.

ENGAGEMENT TOOL	ACTIVITIES
Community reference group (accommodating the function of a community consultative committee) (See also Appendix C)	To ensure the proposal continues to work closely with an informed group of community and agency stakeholders, a group is proposed to meet whilst the site is under construction and thereafter regularly during operations. The group will provide a forum for genuine discussion of construction and operation of the facility, community concerns, information requests, and local initiatives and partnerships. In addition to these general duties, the group will also be responsible for administration of a community funding package. A group of 10 to 15 people is desirable with participants likely to include council staff and councillors from Blacktown and Fairfield councils; the EPA; local schools, child-care facilities and sporting groups; and members of the wider community.
Update emails	Emails distributed to the proposal database noting WSERRC progress and initiatives.
WSERRC website	The website to ensure remain a current source of project information.
Architecture design	A consultation process on the facility design will be undertaken with community stakeholders, and seek collaboration through the Community Reference Group, post project approval.
Onsite visitor and education centre	An open day will be held to open the visitor and education centre that will include displays to help people understand: • the processes occurring on-site • best practice processes and technologies in place • the waste reduction and management best practice. Open days will be held annually.
Future air monitoring	There will be continuous measurement and monitoring of emissions, and data will be made available to the EPA in a real-time graphical publication. A summary of continuous monitoring data and compliance with emissions limits will be published on the WSERRC website.

Table 25 - Ongoing community engagement

APPENDIX A: 2018 QUALITATIVE RESEARCH AND 2019 QUANTITATIVE RESEARCH

2018 Qualitative Research Summary



RESEARCH OBJECTIVES AND METHODOLOGY

Objectives

Newgate Research was commissioned to conduct community research in Western Sydney with the following research objectives;

- Explore knowledge and perceptions of waste management issues and solutions;
- Assess initial support and opposition to energy from waste generally, to the prospect of a plant near Western Sydney and to understand drivers of opinion;
- Assess responses to materials and messaging about energy from waste facilities and understand what is most effective in shifting sentiment;
- Identify features that make sites more and less acceptable;
- Understand perceptions of and trust in the environmental impact assessment and community engagement and consultation processes; and
- Explore the comparative reputations of Cleanaway, Macquarie Bank and Arup amongst others

Methodology

Newgate conducted four 2-hour focus groups on the 29th November 2018, two each in Penrith and Prospect with participants recruited from suburbs nearby potential energy from waste facility sites. Participants were segmented by age and location as shown below.

	Penrith *Eastern Creek and Badgerys Creek sites*	Prospect *Agnes Banks and St Marys sites*
Aged 18-40	10 participants	10 participants
Aged 40+	8 participants	8 participants
Suburbs represented	Cambridge Park, Cambridge Gardens, Colyton, Cranebrook, Kingswood, Lethbridge Park, Oxley Park, Penrith, Ropes Crossing, St Marys, Werrington, Whalan	Bossley Park, Cecil Hills, Erskine Park, Kemps Creek, Leppington, Middleton Grange, Smithfield, St Clair

- Given the qualitative nature of this study, results presented in this report should be considered indicative of the breadth of opinions in the community, and not interpreted as representative of broader public opinion.
- A representative quantitative study is currently underway.

NEWGATE RESEARCH

2

KEY FINDINGS

The following outlines the key findings from four 2-hour focus groups with a total of n=36 participants conducted by Newgate Research on the 29th November, 2018 two each in Penrith and Prospect.

- **Awareness** of waste management processes and issues is low: **there is not as yet a clear problem to solve**.
  - The main issue with waste management was **frequency of collection** and having enough room in their bins.
  - There is **distrust about whether recycling is actually recycled**, with moderate awareness of the changes to China's policy on accepting recycling.
- There was **moderate awareness of Dial a Dump issues** in the Prospect groups (less in the Penrith groups), and it was perceived as an example of consultation done very badly (announce and defend).
  - Concerns in this area about an energy from waste (EFW) facility relate, partly, to this failure of engagement, but primarily due to concerns (which were not addressed in that process) that the facility could have **serious health implications**, **cause traffic issues**, and **affect property values**.
- **Initial responses to the idea of EFW are generally positive** and there is interest in it as a solution, however, there are many questions about potential impacts to the community. The main concerns are **emissions** and **health risks**, with **traffic implications** and **smells** following.
  - It's not initially clear to some participants whether this is **primarily a waste or energy project**, with some reflexively assuming it's about energy, likely because this is a much more frequently discussed topic.
  - Some **see landfill as a reasonable short-term solution** still, though most quickly acknowledge it is not a long-term solution.
- **Appropriate locations** were generally deemed to be **in industrial areas**, and '**far from residential**', especially initially.
  - Definitions of **acceptable buffer zones varied widely**, from 40 metres to 'out in Mudgee or Broken Hill,' though these more extreme views often decreased at least somewhat with exposure to more information.
- The **most powerful means of changing sentiment**, generally and about location, is **providing international examples.**
  - Seeing well-designed facilities in proximity to inhabited areas **softens the baseline assumption that these facilities will be dirty, polluting, and cause health risks**. Images of the three facilities within kilometres of the Eiffel Tower and the Louvre was particularly impactful in challenging these assumptions.

NEWGATE RESEARCH

3

KEY FINDINGS CONT.

- **This assumption was considerably stronger in the Prospect groups for participants near Eastern Creek,** likely due to DADI and the existence of bad smells in the area; those near Agnes Banks and St Marys sites felt more comfortable with the idea of a facility nearby.

➢ Message testing showed that the strongest messages supporting EFW related to **better land use, local jobs, energy production, use of EFW in other cities and countries**, and **issues with landfill**.

- The strongest arguments against EFW related to **emissions**, **potential to impact recycling habits**, **lack of trust in government**, and a potential **increase in council rates**.

➢ **From a list of similar organisations, Cleanaway had the highest awareness among participants and was perceived as neutral to mildly positive.** Sentiment primarily related to Return and Earn, which several participants had engaged in at some point, though there was no further awareness of company issues. There is also **no real differentiation from its competitors**.

- No organisation from the list provided (which included Cleanaway, its competitors and energy companies) was deemed a **compelling contender to build and run a facility of this nature on its own**. For this reason there was a strong desire for **international experience and expertise** to be a salient part of any project.

➢ **The most credible source of information** was felt to be data and testimonies from communities living in proximity to existing EFW facilities. This was viewed as the most critical evidence and source of information.

- Other relatively trusted sources of information include **independent scientists** (CSIRO), **international experts** and those currently running facilities, and **health experts** (Department of Health, Westmead Hospital).
- They did not feel they trusted the EPA, Councils, State Government, nor the proponent organisations.

➢ **Regarding engagement**, participants want representative community engagement with **options for different approaches** (e.g. in person, website, brochure, online surveys), and readily accessible, **clear information** without jargon – absolute transparency.

➢ Given an overview of **the NSW planning process**, **most participants felt overall it was appropriate**, particularly the introduction of community consultation in early planning stages, although we note that nearly all were unfamiliar with the process.

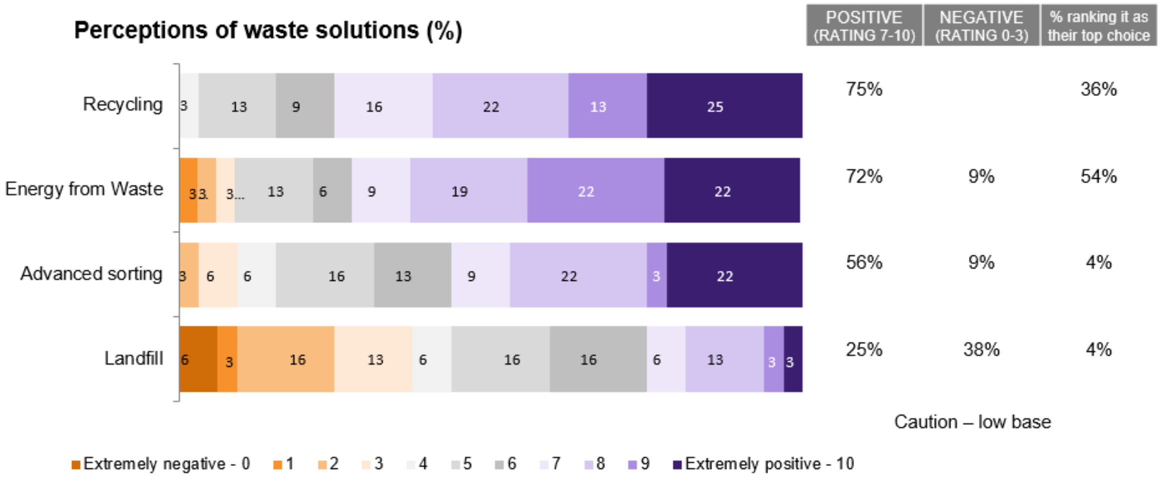
- A number in the Prospect groups in particular cited a lack of trust in their councils and the government to perform the process properly, with concern that consultation was not genuine. In contrast, there was concern among some in the Penrith groups about perceived lack of efficiency and the potential for it to be derailed by 'keyboard warriors'.

NEWGATE RESEARCH

4

PERCEPTIONS OF WASTE SOLUTIONS

Asked their perceptions of four waste solutions after reading short descriptions of each, recycling and EFW were the most positive overall



Q2. Please rate how you fell about each of these solutions based on what you know. Use the scale below where 0 means extremely negative and 10 means extremely positive. After you are finished please rank them from 1-4 where 1 means your most preferred solution.

Base: All participants providing data (n=32).

NEWGATE RESEARCH

5

IN THEIR OWN WORDS

Focus group participants' perceptions of Energy from Waste facilities

"I'm very supportive of the idea but I still think it would be unacceptable in a nearby suburb" – Eastern Creek / Badgerys Creek

"It's amazing, the buildings are clean and pretty. They must be doing it right." – Agnes Banks / St Marys

"It's hard to gain that trust – everything in theory is a fantastic idea. If I could trust that the health impact is not going to impact me or my kids or the next person, but I don't trust the facts to be true." – Eastern Creek / Badgerys Creek

"If there are strict guidelines and it's done properly, I don't care where it goes" – Agnes Banks / St Marys

"There's no need to put it in a metropolitan area" – Eastern Creek / Badgerys Creek

"It seems like it's been used for a long time in other places, why haven't our politicians gotten onto this already?" – Agnes Banks / St Marys

"The benefits are there after doing the research, especially after hearing what the rest of the community has to say." – Eastern Creek / Badgerys Creek

"I need and want to know that it's not going to be harmful, and what are the ongoing costs?" – Agnes Banks / St Marys

"I've heard really negative things from Energy from Waste, it works but you don't want to live anywhere near it" – Agnes Banks / St Marys

"It's a great idea in theory, but am still concerned about the health impact and housing prices, what are the actual benefits to the environment, to household costs how can they guarantee those outcomes?" – Eastern Creek / Badgerys Creek

"Our population is growing, we should look to other countries and see what they're doing" – Eastern Creek / Badgerys Creek

"When you hear Energy from Waste, it makes people feel like something is being done, something good." – Agnes Banks / St Marys

"What is the health impact [of a facility near a residential suburb] over a long period of time; what is the effect on people who live there?" – Eastern Creek / Badgerys Creek

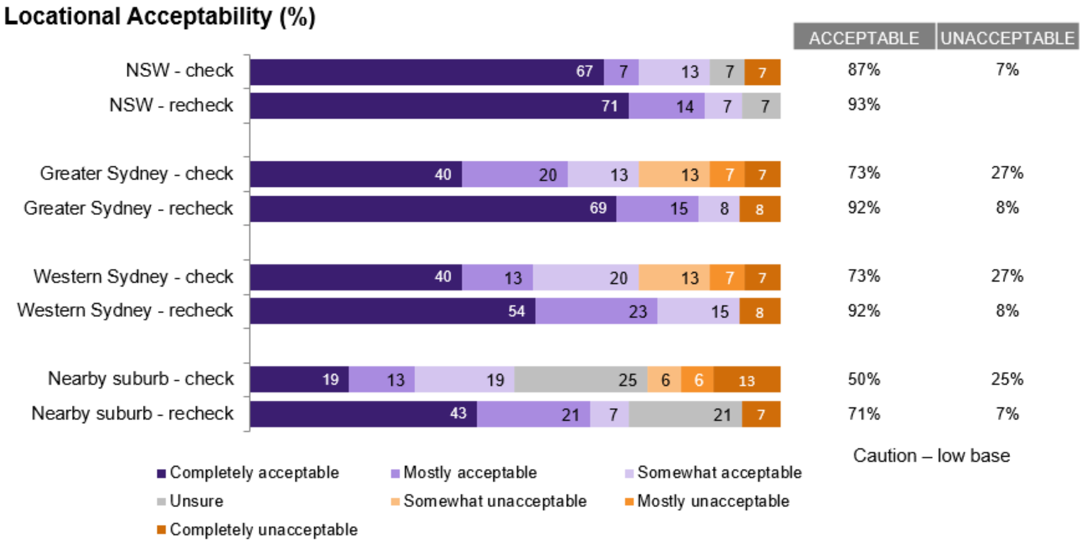
"On face value it's a great thing, but I don't trust the government" – Eastern Creek / Badgerys Creek

NEWGATE RESEARCH

6

ACCEPTABILITY OF FACILITY IN KEY AREAS - PENRITH

Participants were asked their views on the acceptability for an EFW facility before and after messaging and further information



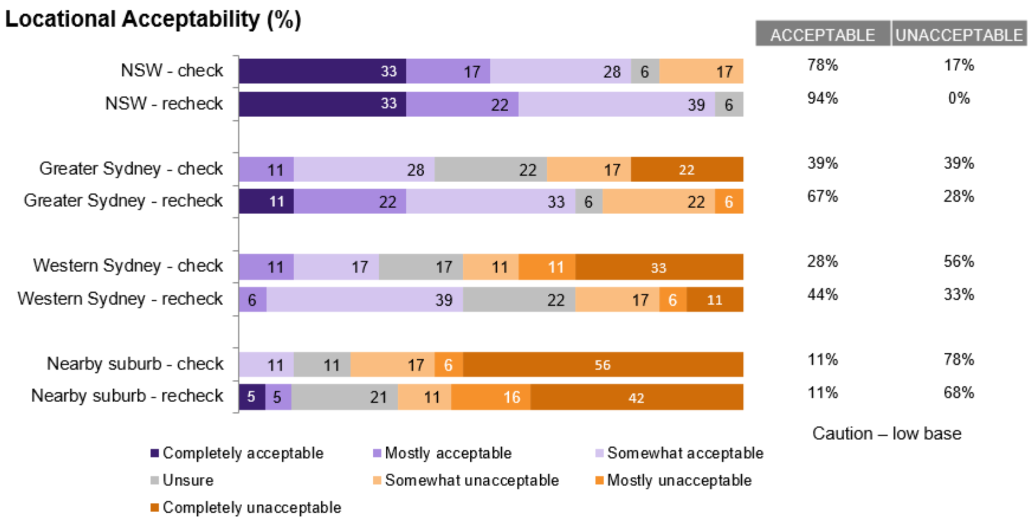
Q3,Q7. Please rate how acceptable you would find a facility like this in the following areas? Q3 = Initial check and Q7 = Recheck later in the group
Base: All participants (n=18).

NEWGATE RESEARCH

7

ACCEPTABILITY OF FACILITY IN KEY AREAS - PROSPECT

Participants from around Eastern Creek and Badgerys Creek had more concerns about an EFW facility than those from near Agnes Banks and St Marys



Q3,Q7. Please rate how acceptable you would find a facility like this in the following areas? Q3 = Initial check and Q7 = Recheck later in the group
Base: All participants (n=18).

NEWGATE RESEARCH

8

RANKING AND AGREEMENT WITH SUPPORTING STATEMENTS

The strongest arguments supporting EFW related to land use, local jobs, energy production, use of EFW in other cities and countries, and issues with landfill

Q4. Please read the statements below and indicate whether you agree or disagree that each statement is a good reason to support an energy from waste facility

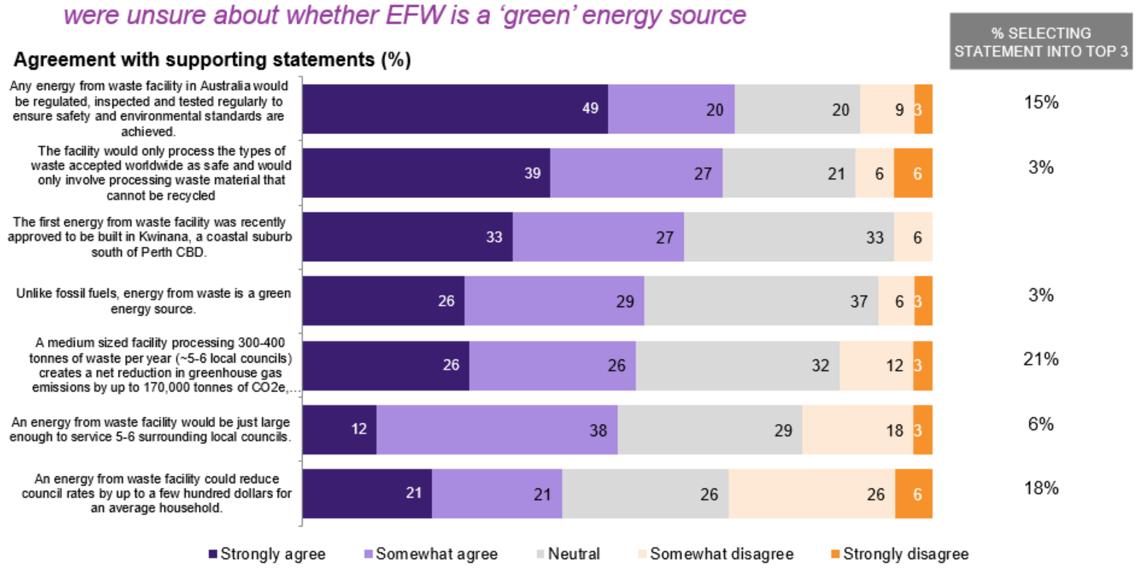
Base: All participants providing data (n=34).

NEWGATE RESEARCH

9

RANKING AND AGREEMENT WITH SUPPORTING STATEMENTS (2)

Participants were less likely to agree with statements about lowered council rates and were unsure about whether EFW is a 'green' energy source



Q4. Please read the statements below and indicate whether you agree or disagree that each statement is a good reason to support an energy from waste facility. When you're finished, please circle the top 3 reasons to support and energy from waste facility

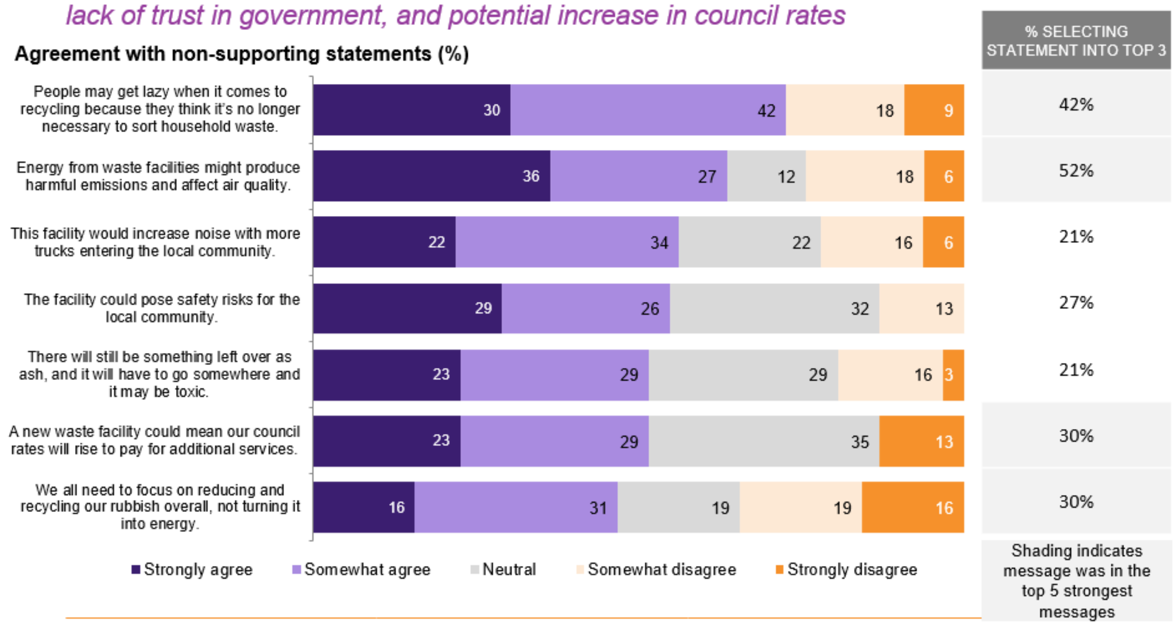
Base: All participants providing data (n=34).

NEWGATE RESEARCH

10

RANKING AND AGREEMENT WITH OPPOSING STATEMENTS

The strongest arguments related to emissions, potential to impact on recycling habits, lack of trust in government, and potential increase in council rates



Q4b. Please read the statements below and indicate whether you agree or disagree that each statement. When you are finished, please circle the top 3 reasons not to support an energy from waste facility.

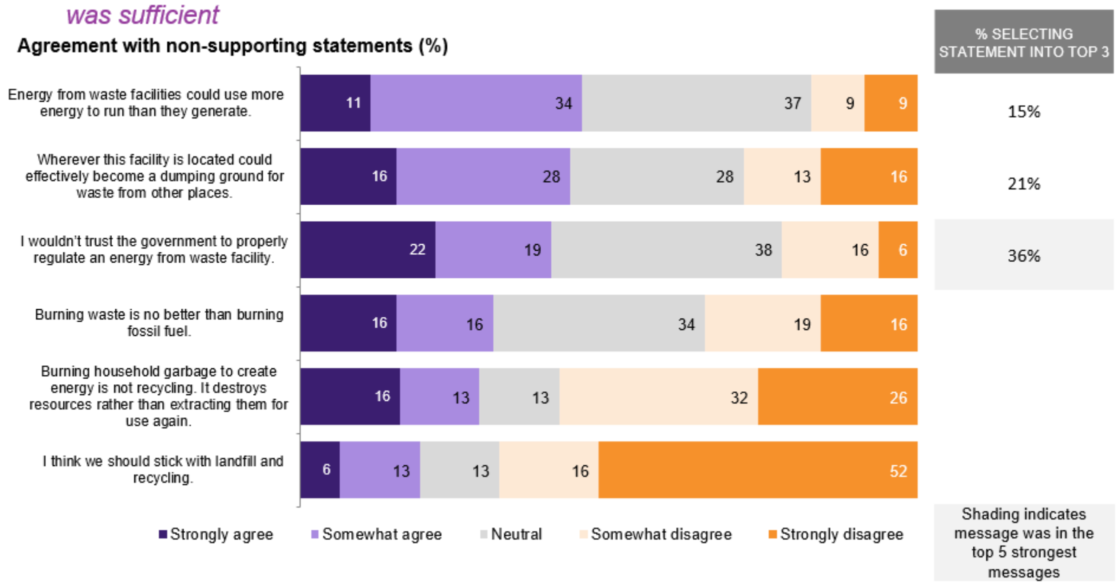
Base: All participants providing data (n=33).

NEWGATE RESEARCH

11

RANKING AND AGREEMENT WITH OPPOSING STATEMENTS (2)

There was strong disagreement with the idea that continuing with landfill and recycling was sufficient



Q4b. Please read the statements below and indicate whether you agree or disagree that each statement. When you are finished, please circle the top 3 reasons not to support an energy from waste facility.

Base: All participants providing data (n=33).

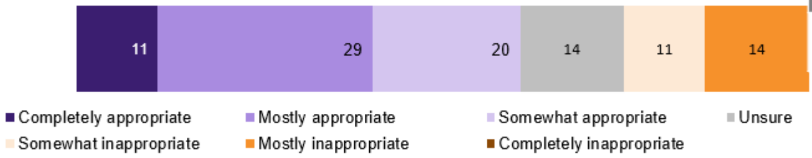
NEWGATE RESEARCH

12

PERCEPTIONS OF PLANNING PROCESS

Though many felt the process seemed appropriate after being shown a description, there was uncertainty about how it worked and whether it would be done properly

Perceptions of Appropriateness (%)



APPROPIATE	INAPPROPRIATE
60%	25%

"Consult early, before its already approved and ready to go" – Eastern Creek / Badgerys Creek

"When the airport came up, the first time was in 92, there were rallies everywhere, but they never sold that land off, so they listened for a bit and then shoved it through later." – Eastern Creek / Badgerys Creek

"There's too much red tape, it could take 2 years to get a 'no'" – Agnes Banks / St Marys

"There need to be different ways of talking to people throughout the process." – Agnes Banks / St Marys

"Not sure that the govt actually does it or actually listens – is it a fake process?" – Eastern Creek / Badgerys Creek

"Seems pretty comprehensive, but keyboard warriors could jump on the bandwagon." – Agnes Banks / St Marys

Q6. How appropriate does this planning process seem to you?
Base: All participants providing data (n=33).

NEWGATE RESEARCH

13

APPENDIX

Research Materials: Fact Sheets

NEWGATE RESEARCH

FACT SHEET 1

Fact Sheet #1: Current Waste Management

In 2014-15 Australia **produced about 53 million tonnes of waste**, which is equivalent to 2.2 tonnes of waste per capita.

Some 21 million tonnes of garbage each year makes its way to hundreds of landfill sites, mostly clustered around our capital cities.

Household waste accounts for 13 million tonnes of the total waste generated, with approximately half of this going to landfill.[1]

Western Sydney produces **over 700,000 tonnes of household waste** each year.

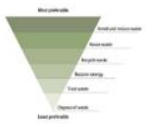
Current waste management practices

There are slightly different ways that councils manage our waste, however most use three key bins for every home.

Other relevant facts

- **Each household produces over 565kg** of waste each year, a level that is increasing.
- **NSW Waste Policy:** *'A circular economy for NSW'* – The NSW Government has identified this as a serious problem and is developing a policy to deliver positive economic, social and environmental outcomes by getting as much out of products and materials as possible and reducing the amount of waste we generate.
- NSW EPA sets out a hierarchy for waste management. **Landfill** (disposal) is the **lowest order** waste management option.

NSW EPA Waste Hierarchy



- The NSW Government **levies a charge of around $140 per tonne of waste** buried in the state. This impacts on the cost of Council Rates.
- There are only two landfills servicing the Sydney metropolitan areas household residual waste. These landfills are quickly being filled meaning alternatives must be explored.

[1] https://www.environment.gov.au/system/files/resources/[illegible]/files/national-waste-report-2016.pdf

NEWGATE RESEARCH

15

FACT SHEET 2

Fact Sheet #2: Waste Solutions

There are **four broad solutions** to the rubbish problem (which could be used on their own or in a combination):

1. **Recycling:** The most environmentally friendly option, though it is not possible to recycle all waste, such as mixed residual waste from our homes including nappies, rags, dirty plastic and paper etc.
   - The recent change in policy by China means they will no longer take on our recycling due to its level of contamination and that we must find alternatives to manage our current recycling and the growth of the sector into the future.
   - As a result of this change, the cost of recycling programs is likely to increase, therefore new policies need to be considered for the future and an increased level of re-processing of recyclables undertaken in Australia.
   - Opportunities exist to increase the level of organic waste recycling by diverting food waste from household residual bins into the organics bin.
2. **Advanced sorting technologies** extract some of the recyclable content from the rubbish (e.g. magnets to collect metals), plus composting the remaining garbage to reduce the amount of waste that goes to landfill.
   - While these technologies reduce the volume of waste going to landfill, it is costly, odorous and produces lower quality outputs for reuse.
   - The low-quality compost produced by these facilities has now been banned by the NSW EPA from being applied to land or even used in mine site rehabilitation, and are therefore likely to end up in landfill.
3. **Energy from Waste** describes a process where energy and resources are recovered from waste through processing – resulting in heat, electricity or fuel. Energy from Waste has been used in Europe, North America and Asia for many years.
   - **Combustion** – thermal treatment of waste to produce energy (e.g. heat, electricity or steam) and is the most common method of the three. This technology has been tried and tested with a clear understanding of its impacts.
   - **Gasification** – thermal treatment of waste in reduced oxygen conditions to produce gas that can either be combusted (to produce heat, electricity or steam), or the gas used in other applications. This is mostly used in Japan, and has a higher cost, lower energy production and less flexibility in the wastes it can treat.
   - **Anerobic Digestion** – using biological processes (e.g. bacteria) to 'eat' organic waste and produce gas that can be used for energy. This method of treatment is suitable for clean organic waste streams (e.g. food and garden waste), rather than for mixed residual waste.
4. Build **more landfills** somewhere in Sydney / NSW, which has been the dominant historical waste disposal method in Australia.
   - There are now only two remaining landfill sites servicing the Sydney metropolitan areas household waste. These landfill sites are filling up, so another option would be to find more landfill sites for the future.
   - Landfills are regarded as the least environmentally friendly way to dispose of household waste.
   - If not engineered and managed effectively there is a higher risk of health and environmental impacts.

KMH Environmental, 2016, NSW Resource Recovery Infrastructure Needs Analysis

Diagram of Energy from Waste Process

NEWGATE RESEARCH

16

FACT SHEET 3

Fact Sheet #3
Energy from Waste

What is Energy from Waste?

Energy from Waste is a process where energy and resources are recovered from waste through processing – resulting in heat, electricity or fuel.

Energy from Waste uses materials that cannot be recycled such as residual household waste including nappies or rags that currently go to landfill.

Energy from Waste produces constant base-load energy that can help meet energy needs while also producing by-products that can be reused in road-bases and aggregates. All new waste to energy plants in OECD countries must meet strict emission standards.

In the United States there are 80 Energy from Waste facilities generating electricity.[1] The UK currently has 32 facilities, and the 32 energy from waste facilities in Sweden produce electricity for 250,000 homes while also providing heating for nearby homes.[2]

There are currently no energy from waste facilities operating in Australia, though the first-ever Australian project has just been approved in Perth, with construction to begin this month.

Benefits of energy from waste plants

- **Reduces dependence** on fossil fuels and the need to mine for new resources such as coal and gas
- **Vastly reduce the need for landfills** which will eventually reach capacity
- **Opportunity to lower council rates** in light of increasing costs of landfills
- Generate continuous **24/7 base-load power** in a way that some other renewable sources cannot
- **Provide 'local' energy supply** by distributing power generation at or near the point of consumption
- **Creates jobs** during construction and for continuing operation
- **Reduces greenhouse gases by recycling materials that would produce methane as landfill** – a gas that has up to 21 times more impact on the environment than carbon dioxide (CO_2)

Energy from Waste facilities around the world.

Spittelau Vienna, Austria

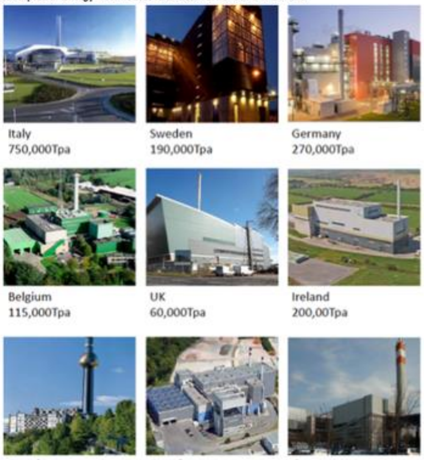
A2A Brescia, Italy

Amager Bakke, Copenhagen

[1] http://www.eia.gov/energyexplained/index.cfm/data/index.cfm?page=biomass_waste_to_energy

[2] https://sweden.se/nature/the-swedish-recycling-revolution/

Examples of Energy from Waste facilities from around the world



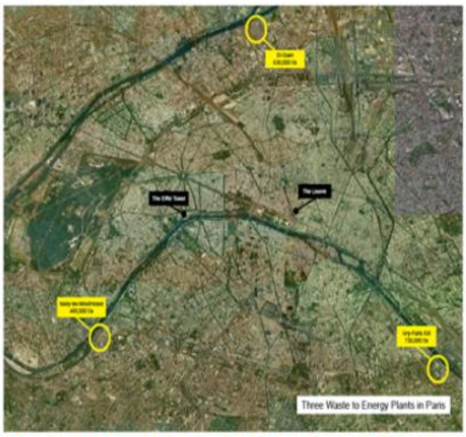
Italy 750,000Tpa	Sweden 190,000Tpa	Germany 270,000Tpa
Belgium 115,000Tpa	UK 60,000Tpa	Ireland 200,00Tpa
Austria 250,000Tpa	Austria 330,000Tpa	Germany 225,000Tpa

NEWGATE RESEARCH

17

FACT SHEET 3

Three major waste to energy facilities are located in central Paris, recycling local waste and supplying renewable energy to about 245,000 local homes

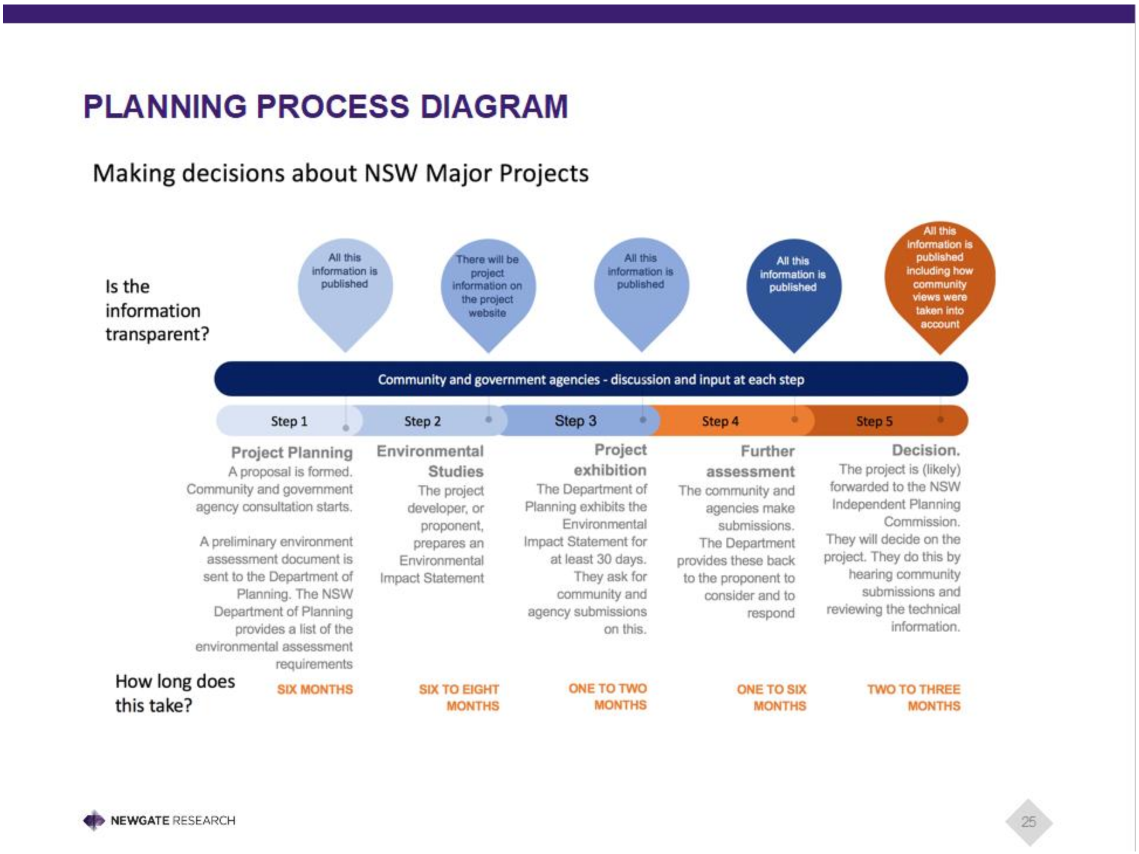


These plants prevent the release of 900,000 tonnes of CO_2 into the atmosphere each year

Issey-les-Moulineaux 460,000 t/a	St-Ouen 630,000 t/a	Ivry-Paris XIII 730,000 t/a

NEWGATE RESEARCH

18



PLANNING PROCESS DIAGRAM
Making decisions about NSW Major Projects
Is the information transparent?
All this information is published
There will be project information on the project website
All this information is published
All this information is published
All this information is published including how community views were taken into account
Community and government agencies - discussion and input at each step
Step 1
Step 2
Step 3
Step 4
Step 5
Project Planning
A proposal is formed. Community and government agency consultation starts.
A preliminary environment assessment document is sent to the Department of Planning. The NSW Department of Planning provides a list of the environmental assessment requirements
Environmental Studies
The project developer, or proponent, prepares an Environmental Impact Statement
Project exhibition
The Department of Planning exhibits the Environmental Impact Statement for at least 30 days. They ask for community and agency submissions on this.
Further assessment
The community and agencies make submissions. The Department provides these back to the proponent to consider and to respond
Decision.
The project is (likely) forwarded to the NSW Independent Planning Commission. They will decide on the project. They do this by hearing community submissions and reviewing the technical information.
How long does this take?
SIX MONTHS
SIX TO EIGHT MONTHS
ONE TO TWO MONTHS
ONE TO SIX MONTHS
TWO TO THREE MONTHS
NEWGATE RESEARCH
25

Sydney
+61 2 9232 9550
Level 18, 167 Macquarie Street
Sydney NSW 2000
Canberra
+61 2 9232 9500
John McEwen House
7 National Circuit
Barton ACT 2600
Melbourne
+61 3 9611 1850
Level 18, 90 Collins Street
Melbourne VIC 3000
Brisbane
+61 7 3009 9000
Level 14, 110 Eagle Street
Brisbane QLD 4000
NEWGATE RESEARCH

2019 Quantitative Research Report

REPORT PREPARED FOR

Cleanaway and Macquarie Capital

REPORT PREPARED BY

Sue Vercoe | Managing Director
02 9232 9502 | sue.vercoe@newgateresearch.com.au

Erin Allingham | Director
02 9232 9500 | erin.allingham@newgateresearch.com.au

Heather Jones | Associate Director
02 9232 9500 | heather.jones@newgateresearch.com.au

DISCLAIMER

In preparing this report we have presented and interpreted information that we believe to be relevant for completing the agreed task in a professional manner. It is important to understand that we have sought to ensure the accuracy of all the information incorporated into this report.

Where we have made assumptions as a part of interpreting the data in this report, we have sought to make those assumptions clear. Similarly, we have sought to make clear where we are expressing our professional opinion rather than reporting findings. Please ensure that you take these assumptions into account when using this report as the basis for any decision-making.

The base (number and type of respondents asked each question) and the actual survey questions are shown at the bottom of each page. Results may not always total 100% due to rounding.

This project was conducted in accordance with AS: ISO20252:2012 guidelines, to which Newgate Research is accredited. Project reference number: NGR 1807007.

BESTPRACTICE CERTIFICATION AMSRO ISO20252 MARKET, OPINION & SOCIAL RESEARCH

EXECUTIVE SUMMARY

This report is based on a quantitative survey of n=2,285 including n=1,200 from Greater Sydney, n=395 from Penrith LGA, n=415 from Blacktown LGA, and n=275 from Liverpool LGA. The fieldwork was conducted between January 11th and 28th 2019.

WASTE MANAGEMENT IN CONTEXT

Cost of living, health services, and the **cost and availability of energy** were the most important issues these respondents were facing (from a prompted list). **Waste management** is less important, but most (73%) still rated its importance at 7+ out of 10.

Knowledge about what happens to waste after collection is reasonably low, with 65% saying they know little or nothing (rising to 74% in Liverpool and Penrith). However 90% **care about it**, with 47% saying they care a lot.

In line with qualitative findings, baseline **sentiment toward landfill** is evenly divided (32% positive, 33% negative, 35% neutral).

PERCEPTIONS OF ENERGY FROM WASTE

Around half of respondents (52%) said they were **aware** of and knew at least a little bit about energy from waste (EFW). Awareness was slightly lower in Liverpool and Penrith LGAs (42% and 45%).

After being provided with brief facts about four waste management options, respondents felt **most positively about recycling (85%) and energy from waste (77%)**, with 36% positive towards landfill. Many who preferred landfill found it difficult to explain why, suggesting it may not be an issue they have thought deeply about.

When asked to choose, respondents **strongly preferred EFW to landfill** (89% vs 11%) as a means of managing residual waste. Those in support considered it a positive use of waste, a valuable new source of cheaper energy and better for the environment than landfill. Many of those in support of landfill found it more difficult to articulate a reason, while others just felt it was a better option and likely to be cheaper than EFW.

Based on the brief information they were shown on waste management options, 70% said they would accept an EFW facility in NSW, 54% said they would accept one in the Greater Sydney area, and 42% said they would accept an EFW facility in industrial areas in a nearby suburb.

RESPONSE TO INFORMATION

Acceptability of an EFW facility in an industrial area in a nearby suburb increased after further information on EFW, with results showing a small but statistically significant increase from 42% to 49%. This largely reflects a movement from the 'unsure' to 'somewhat acceptable' category, with the proportion who said it was unacceptable remaining largely unchanged.

The impact of project messages is not as strong as we sometimes see on infrastructure projects and this reflects both uncertainty about health and environmental impacts and a lack of understanding of the issues. It is also clear that opinions tend to be based on values (what is fundamentally most important to individuals e.g. health, jobs, environment) and that messaging needs to be carefully framed with these in mind.

Note that people were noticeably more likely to accept the project benefits case if they heard about waste management issues and positive messages about EFW before they heard negative messages.

EXECUTIVE SUMMARY CONT.

Participants found **supportive information highly credible**. At an overall level, the strongest messages (with highest credibility and persuasiveness) for a proactive campaign were:

- *The energy produced could* ***power tens of thousands of Sydney homes and businesses***
- *An energy from waste facility is a good idea as long as we can be sure there* ***won't be negative health or environmental impacts*** *for the local community*
- *Energy from waste is a good idea in combination with policy whereby manufacturers are required to* ***reduce the amount of packaging they use***
- *This technology is* ***already being used safely and reliably*** *at around 2000 sites and in the heart of major cities including Paris, Monte Carlo, Copenhagen, Dublin and Stockholm.* Note that the qualitative research suggests this message is even more powerful when supported by images of these facilities, particularly those that show their location relative to houses.

For a reactive campaign messages that provided reassurance and set EFW meaningfully apart from landfill, were strongest:

- *This approach turns waste that would otherwise be buried in landfill* ***into household energy***
- *Any energy from waste facility in Australia* ***would be regulated, inspected and tested regularly*** *to ensure safety and environmental standards are achieved*
- *Creating energy from waste will* ***preserve land for other, better uses*** *than burying rubbish*
- *This technology is* ***already being used safely and reliably*** *at around 2000 sites and in the heart of major cities including Paris, Monte Carlo, Copenhagen, Dublin, and Stockholm*

Respondents generally found **opposing messages** less credible. The strongest opposing messages were:

- *The facility could pose* ***safety risks for the local community***
- *This facility would increase noise with* ***more trucks entering the local community***
- *A new waste facility could mean our* ***council rates will rise to pay for additional services***
- ***There will still be something left over as ash,*** *and it will have to go somewhere and it may be toxic*

Some differences in message effectiveness were observed by LGA and are detailed within the body of this report. When asked for their preferences around terminology, 66% **preferred Energy from Waste** and 34% preferred Waste to Energy.

ENGAGEMENT PREFERENCES AND COMMUNITY BENEFITS

Most respondents said they **would simply like to be informed** about plans for any local EFW, but just under a third want to be consulted or more deeply involved. Desire to get involved is higher than for other infrastructure projects for which we have conducted similar research.

When asked about potential community benefits there was strongest support for **subsidised energy pricing** and **local employment opportunities** offered to those near an EFW facility.

The most trusted sources included **scientific bodies and universities**, the **EPA**, **NSW Department of Health**, and testimonies from **communities living near existing facilities**.

BRAND PERCEPTIONS

Awareness of Cleanaway was relatively high.

NEWGATE RESEARCH

5

KEY DIFFERENCES BY LOCATION

		Greater Sydney	Blacktown LGA	Liverpool LGA	Penrith LGA	Rest of Sydney
Sample: n =		***2,285***	*415*	*275*	*395*	*1,200*
CARE WHAT HAPPENS TO WASTE	Care a lot / a bit	**90%**	88%	83%	90%	90%
	Don't care much / at all	**10%**	12%	17%	10%	10%
KNOW WHAT HAPPENS TO WASTE	Know a lot / a fair bit	**35%**	31%	26%	27%	36%
	Know little bit / nothing	**65%**	69%	74%	73%	64%
RESIDUAL WASTE MANAGEMENT **PREFERENCE** *(BASELINE SENTIMENT*)*	Energy from waste	**89%**	88%	92%	92%	88%
	Landfill	**11%**	12%	8%	8%	12%
PERCEPTIONS OF ENERGY FROM WASTE *(BASELINE SENTIMENT*)*	Positive (7+ out of 10)	**77%**	75%	73%	72%	78%
	Neutral (5-6 out of 10)	**14%**	14%	16%	16%	13%
	Negative (0-4 out of 10)	**4%**	6%	4%	5%	4%
ACCEPTABILITY OF ENERGY FROM WASTE FACILITY IN A **NEARBY SUBURB** *(BASELINE SENTIMENT*)*	Highly acceptable	**15%**	18%	11%	12%	16%
	Somewhat acceptable	**27%**	26%	27%	27%	27%
	Unsure	**31%**	35%	33%	31%	31%
	Somewhat unacceptable	**13%**	12%	16%	15%	13%
	Highly unacceptable	**14%**	9%	13%	14%	14%
ENGAGEMENT PREFERENCE IF A FACILITY WAS BEING DEVELOPED IN THEIR LOCAL AREA	Want to be consulted / more deeply involved	**29%**	25%	27%	24%	29%
	Want to be informed	**45%**	43%	44%	45%	46%
	Not sure / not interested	**26%**	32%	29%	31%	25%

*After they read a brief description of Recycling, Advanced sorting, Energy from Waste and Landfill, but before they saw more detailed information on Energy from Waste

Significantly lower than other locations @ 95% confidence level

Significantly higher than other locations @ 95% confidence level

NEWGATE RESEARCH

KEY OBSERVATIONS BY LOCAL GOVERNMENT AREA

Blacktown LGA

- Reasonable knowledge of EFW as a concept.
- Fewer who feel an EFW facility in their local area is highly unacceptable (statistically significant difference).
- Motivated by EFW messaging relating to local jobs, power for thousands of homes, creation of energy from waste and the fact EFW is used elsewhere.

Knowledgeable and reasonably accepting of EFW, providing key messaging hits the mark.

Liverpool LGA

- Less knowledge about what happens to their waste than the other LGAs and also less care.
- Know less about EFW than those in other LGAs. However, also reasonably negative towards landfill.
- Waste is a topic that appears to be lower down the priority list, even though they are less satisfied than others about aspects of current waste services.
- Motivated by similar EFW messaging to those in Blacktown but also would like to have reassurances that any facility would be well-managed. They do not want to see their LGA used as a dumping ground and have concerns about the ability for the government to manage an EFW.

Some work to do here in terms of education and a stronger sense of NIMBY-ism. Potentially a harder task to build acceptance of EFW than for other LGAs.

Penrith LGA

- Relatively low knowledge about what happens to their waste, but reasonably negative towards landfill.
- Their knowledge of EFW is fairly poor and they are less accepting of a facility in a suburb near them than those in Blacktown LGA. However, they were shifted positively by the messaging to a greater extent than in the other LGAs.
- They appear more motivated by messaging that encourages recycling and reuse of waste and reduction of packaging. Communications about EFW should therefore be framed within this context.

This LGA appears particularly keen to see an EFW placed into a waste management framework that works to reduce the amount of waste created in the first place.

COMMUNICATIONS CONSIDERATIONS

1. **Communications increases project acceptability.** Regardless of the order of message delivery, all communication increased the level of acceptability of an EFW facility in a local area.
2. **Communicating the concept is equally important as communicating the project, and if possible should influence how we frame information.** A number of findings point towards a strategy that sees an education campaign on the benefits of EFW, educating the community on the concept of EFW, as a precursor to site specific communications and engagement.

Evidence re this is the support for an EFW facility somewhere in NSW being far higher than support for one in a nearby suburb; the knowledge gaps and also the interest in the issue of waste management. It appears being very clear about these messages will have significant advantages.

Further, previous research amongst people directly impacted by infrastructure development showed that they were more accepting if they were are already supportive of the project or concept in principle – they became more philosophical that it was needed and had to put somewhere.

3. **Describe the benefits of EFW being a form of energy production:** Securing a reliable supply of cheap energy is a key priority for many. The research suggests framing the project as creating 'Energy from Waste' with the added benefit of reducing waste, rather than on the technology as a means to reduce waste.
4. **Demonstrate the link between EFW and recycling.** Both the qualitative and quantitative research showed strong support for recycling and it must be clear that this approach deals with what is left after recycling as far as possible.
5. **Credibility on health and safety planning is critical.** The research reinforces that the key challenge will be to reassure the community around health, environmental and traffic impacts. Results from both studies show the opinions and experiences of communities living near existing EFW facilities will be very powerful. Other credible sources are scientific bodies and universities, the EPA and the NSW Department of Health.
6. **Images and video.** The qualitative research suggested images of other EFW facilities was particularly useful. Other research we conduct consistently shows videos and infographics are the most effective way to communicate complex projects of this nature and we suggest a focus on this medium moving forward and inclusion of testimonials from communities living near existing facilities.
7. **Demand for engagement is relatively high.** The research reinforces higher than usual expectations for consultation and involvement.

NEWGATE RESEARCH

8

INTRODUCTION

BACKGROUND, OBJECTIVES AND METHODOLOGY

NEWGATE AUSTRALIA

9

RESEARCH OBJECTIVES

This research follows exploratory qualitative community research conducted by Newgate Research in December 2018. Specifically this survey aims to establish:

- Knowledge and perceptions of waste management and recycling issues and management approaches;
- Levels of support and opposition to energy from waste (EFW) and the prospect of a facility in a suburb near them;
- Key drivers of opinion, misunderstandings, knowledge gaps, questions and concerns;
- Information about energy from waste that is most effective in shifting sentiment;
- Trust in various sources of information, including experts such as the CSIRO, NSW Chief Scientist & Engineer, etc;
- Expectations around engagement and consultation for this project; and
- Key metrics by location and demographic segment, including identification of the profile of the target audience(s) for communications activities.

NEWGATE RESEARCH

10

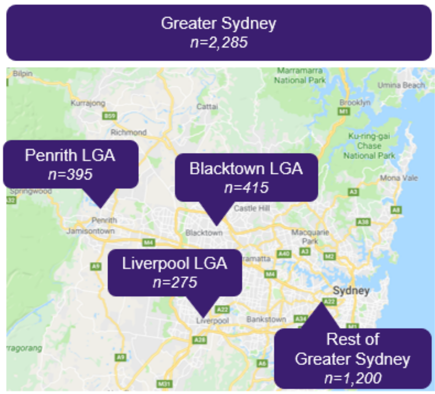
METHODOLOGY AND SAMPLE

TARGET AUDIENCE AND SAMPLING

- A general community sample, representative of a cross-section of age and gender across the Greater Sydney region.
- Respondents were screened to ensure that they, or anyone in their immediate family did not work in waste management, energy, government (public policy or local government), media or journalism. They were also screened to ensure they had not participated in any research into waste or energy topics in the last six months.

SAMPLE SIZE AND FIELDWORK

- **Fieldwork** was conducted between 11th and 28th January 2019.
- **A total sample size of n=2,285 respondents were surveyed for this project.** This included an oversample of respondents in specific LGAs (Blacktown, Liverpool and Penrith) to enable robust analysis of how opinion differs in these areas. The sample obtained in each LGA is shown in the graphic opposite.
- The sample population of n=2,285 equates to a margin of error of +/- 2.0% at the 95% confidence interval. The sample and margin of error for the LGAs and Rest of Sydney sample are:
  - **Blacktown LGA:** n=415. Margin of error = +/-4.8%
  - **Liverpool LGA:** n=275. Margin of error = +/-5.9%
  - **Penrith LGA:** n=395. Margin of error = +/-4.9%
  - **Rest of Sydney:** n=1,200. Margin of error = +/-2.8%
- For analysis purposes, the data was weighted to correct for the overrepresentation of the specific LGAs to enable reporting of data at an overall level and by each LGA.



NEWGATE RESEARCH

11

SAMPLE COMPOSITION

The sample represented a good cross-section of the Greater Sydney population

		WTD*
Sample: n=		*2,285*
GENDER	Male	46%
	Female	54%
AGE	18-34	31%
	35-54	34%
	55+	35%
HOUSEHOLD TYPE	Single	21%
	Couple, no children	13%
	Children under 5	13%
	Children aged 6-11	12%
	Children aged 12-17	10%
	Adult children at home	12%
	Empty nester	16%
HOUSEHOLD INCOME**	<$80,000	40%
	$80,000+	46%
WORK STATUS	Full-time employee	41%
	Part-time employee	15%
	Self-employed/ business owner	5%
	Not working/ student	38%

		WTD*
Sample: n=		*1,900*
HOME OWNERSHIP	Own outright	36%
	Mortgagee	28%
	Renting	32%
HOUSE TYPE	Larger house	52%
	Smaller house	19%
	Apartment/ unit	28%

		WTD*
Sample: n=		*1,900*
VOTING INTENTION***	Labor Party	24%
	Liberal Party	25%
	National Party	2%
	The Greens	9%
	Independent	6%
	Other	4%
	Undecided	20%
STRENGTH OF VOTE	Hard	43%
	Soft	47%
	Unknown	9%

NEWGATE RESEARCH

*WTD = Data weighted on location to correct the deliberate oversample in the LGA areas

**14% did not want to disclose their income ***9% did not want to disclose their voting intention

12

NOTES TO THE READER

This research was conducted in accordance with the international quality standard for market and social research (ISO 20252), to which Newgate Research is accredited.

In preparing this report we have presented and interpreted information that we believe to be relevant to achieve the objectives of this research project.

Where assumptions are made as a part of interpreting the results or where our professional opinion is expressed rather than merely describing the findings, this is noted. Please ensure that you take these assumptions into account when using this report as the basis for any decision-making.

Please note that percentages on single response questions may not total 100% due to rounding, or if the question allowed multiple responses the total may also exceed 100%.

Caution should be taken when interpreting results based on small sample sizes below n=30.

Quotas and weighting were used to ensure a representative mix of residents in Greater Sydney.

The actual questions asked in the survey are shown at the bottom of each page, along with the respondent base (typically all respondents). The questionnaire is also provided in Appendix One.

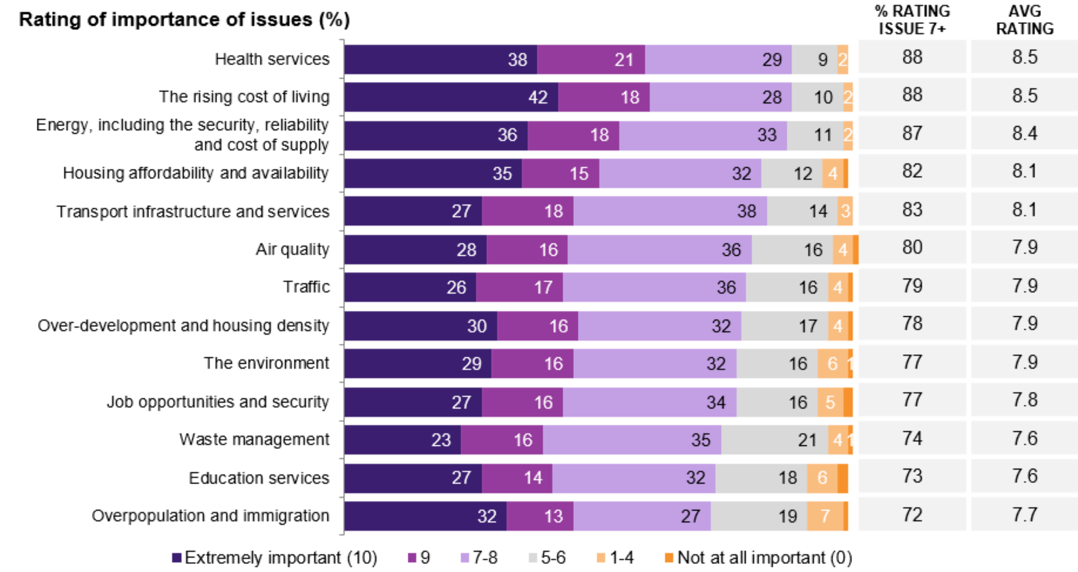
Relevant statistically significant differences between sub-groups or questions are identified throughout the report at the 95% confidence level. These are shown in red font for significantly lower and blue font for significantly higher differences.

Verbatim quotes from the research are included in the report to further support and provide evidence of the findings. Quotes are annotated with the relevant segment.

BASELINE KNOWLEDGE AND PERCEPTIONS OF WASTE ISSUES

ISSUES OF IMPORTANCE TO SYDNEY RESIDENTS

Energy cost and supply was a top-three issue alongside the rising cost of living and health services; while important to most, the importance of waste management was rated lower



Q1. Below is a list of issues that other people have said are important to them, their family and their quality of life. For each, please rate how important these issues are to you and your household, where 0 means not at all important and 10 means extremely important.
Base: All respondents – Weighted data (n=2,285)

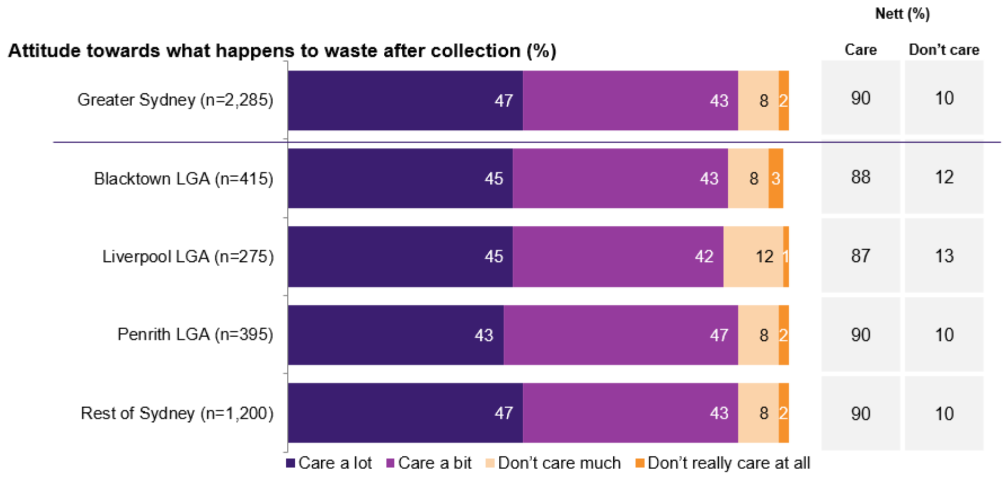
NEWGATE RESEARCH

FULL PROFILING OF IMPORTANCE OF WASTE MANAGEMENT IS GIVEN IN THE APPENDIX. NO SIGNIFICANT SKEWS EMERGE

15

HOW MUCH RESIDENTS CARE WHAT HAPPENS TO WASTE

The majority of respondents claim to care at least a bit about what happens to waste once it is collected from their home



Q2 How much would you say you care about what happens to waste once it's collected from your home?
Base: All respondents – Weighted data (bases on the chart)

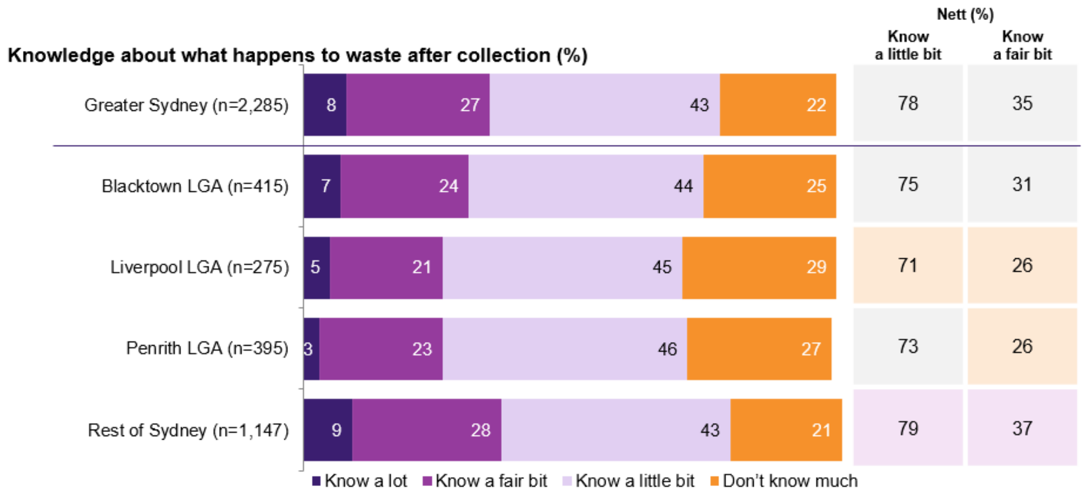
NEWGATE RESEARCH

Significantly lower than other locations @ 95% confidence level
Significantly higher than other locations @ 95% confidence level

16

HOW MUCH RESIDENTS KNOW ABOUT WHAT HAPPENS TO WASTE

Most feel they know at least a little about what happens to their waste once collected, but only a minority claim to have good knowledge (i.e. know at least a fair bit)



Q3 How much do you feel you know about what happens to waste once it's collected?
Base: All respondents – Weighted data (bases on the chart)

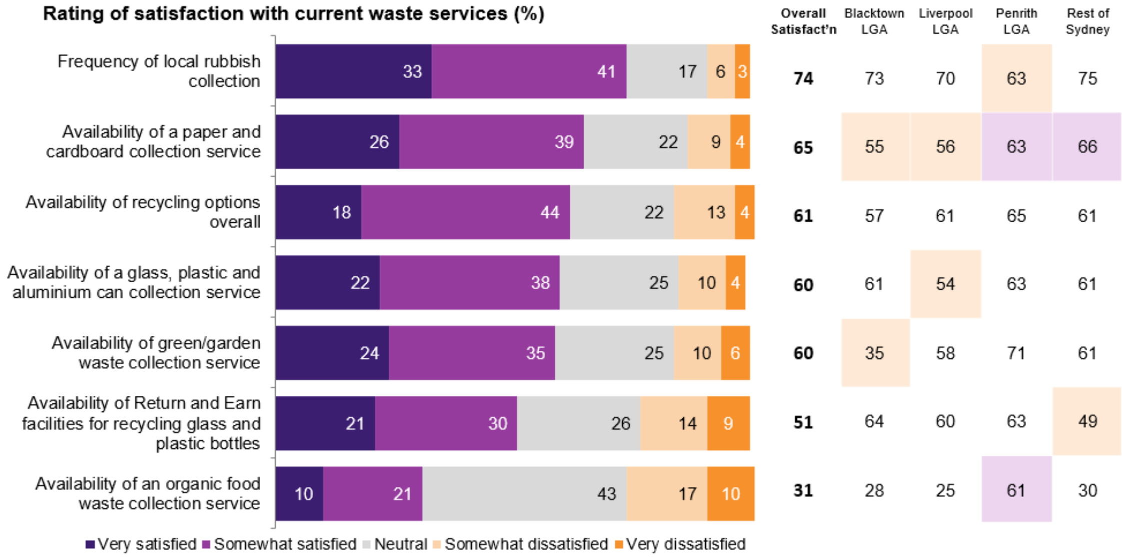
NEWGATE RESEARCH

Significantly lower than other locations @ 95% confidence level
Significantly higher than other locations @ 95% confidence level

17

SATISFACTION WITH WASTE SERVICES – SYDNEY RESIDENTS

Most respondents are generally satisfied with their waste services (excluding organic food services); some differences in satisfaction with specific services were seen across the LGAs



Q4 How would you rate your satisfaction with the following services?
Base: All respondents – Weighted data (n=2,285) Blacktown LGA (n=415), Liverpool LGA (n=275), Penrith LGA (n=395), Rest of Sydney (n=1,200)

NEWGATE RESEARCH

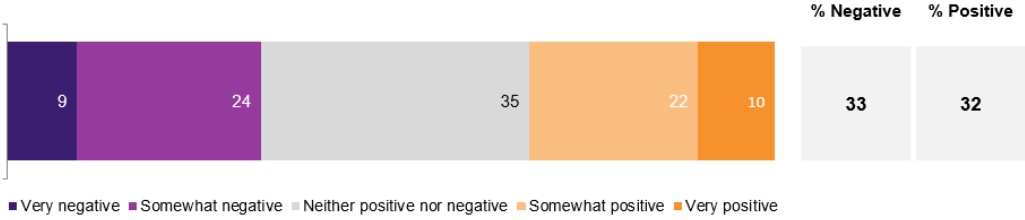
Significantly lower than other locations @ 95% confidence level
Significantly higher than other locations @ 95% confidence level

18

SENTIMENT TOWARDS LANDFILL TO DEAL WITH WASTE

Before receiving information on waste management options, sentiment is nearly evenly divided on landfill, with males, 18-34 year olds, workers and young families most positive

Rating of sentiment towards landfill (Baseline) (%)



COMMENTARY

Those in Penrith LGA were more negative to landfill than other locations (41% vs. 33% in other areas). Those in Liverpool LGA were not far behind (38% vs. 33% in other areas).

Those most (significantly) positive towards landfill were:

- Those aged 18-34 (39% vs 29% of others)
- Those with children under 12 at home (37% vs 30% of others)
- Males (38% vs 27% of females)
- Those employed full-time (35% vs. 27% of others)

Those most (significantly) negative towards landfill were Greens voters (50% were negative, compared to 33% of those anticipating voting for other candidates).

Q5 How do you feel about landfill as a way to deal with Sydney's waste, excluding recycling and organic/garden waste?
Base: All respondents – Weighted data (n=2,285)

FULL PROFILING IS IN THE APPENDIX

NEWGATE RESEARCH 19

PROMPTED KNOWLEDGE AND PERCEPTIONS OF WASTE ISSUES

RESPONDENT PERCEPTIONS AFTER READING INFORMATION

NEWGATE AUSTRALIA 20

Initial Info

AT THIS POINT, PARTICIPANTS WERE PRESENTED WITH THE FOLLOWING INFORMATION

Current Waste Management

- Australia is **the fourth highest producer of municipal waste per capita in the world**, after Denmark, the US, and Switzerland.[1]
- In Australia, approximately 50% of our waste is recycled - but the rest goes to landfill.
- The NSW Government has **identified waste management as a serious problem** and is developing a policy to deliver positive economic, social and environmental outcomes by getting as much out of products and materials as possible and reducing the amount of waste we generate.
- The NSW Government **levies a charge of around $140 per tonne of waste** buried in the state. This impacts on the cost of Council Rates.
- NSW EPA sets out a hierarchy for waste management. Landfill (disposal) is the lowest order waste management option.
- There are only **two landfills servicing the Sydney metropolitan areas** household residual waste. These landfills are quickly being filled meaning alternatives must be explored.

1) https://www.forbes.com/sites/niallmccarthy/2015/10/28/the-countries-generating-the-most-municipal-waste-infographic/#4ce5a8907487)

Waste Management Options and Issues

Recycling	Advanced Sorting	Energy from waste	Landfill
The most environmentally friendly option, though it is not possible to recycle all waste, such as mixed residual waste from homes including nappies, rags, dirty plastic and paper etc.	This extracts some of the recyclable content from rubbish (e.g. magnets to collect metals), plus processing the remaining garbage to produce low quality compost.	A process where energy and resources are recovered from waste through processing, usually via thermal treatment (combustion) – resulting in heat, electricity or fuel. Energy from waste has been used in Europe, North America and Asia for many years.	Historically this has been the dominant waste disposal method in Australia. There are only two remaining landfill sites servicing Sydney, and building more landfills will be necessary if this disposal method is continued.
The recent change in policy by China means they will no longer take on our recycling due to its level of contamination and that we must find alternative ways to manage our recycling.	These technologies recover some recyclables, however they are costly, odorous and the outputs are low quality and may still end up in landfill under current regulations.	There are currently no energy from waste facilities operating in Australia, though the first ever Australian project has just been approved in Perth, with construction to begin this month.	This is the least environmentally friendly way to dispose of household waste.

KMH Environmental, 2016, NSW Resource Recovery Infrastructure Needs Analysis

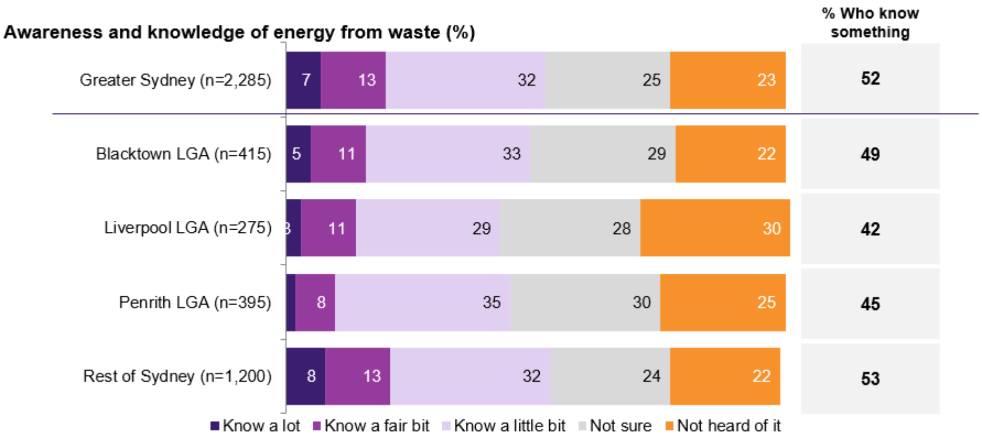
NEWGATE RESEARCH

21

After initial Info

AWARENESS AND KNOWLEDGE OF ENERGY FROM WASTE

Around half of respondents had previously heard about energy from waste but tend to have limited knowledge; awareness levels are slightly lower in Liverpool LGA



Q9 Before today, had you ever heard of the concept of energy from waste as a way of managing waste that cannot be recycled?

Base: All respondents – Weighted data (bases on the chart)

Significantly lower than other locations @ 95% confidence level

Significantly higher than other locations @ 95% confidence level

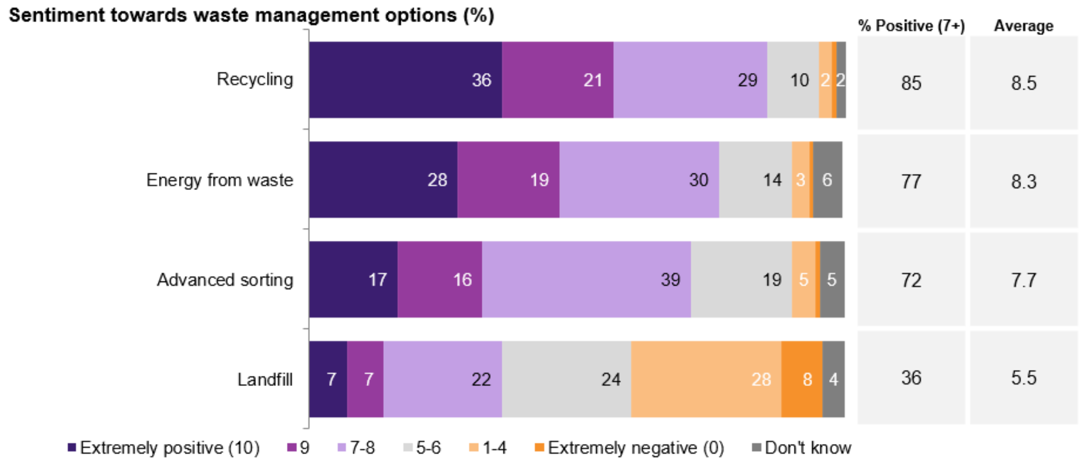
NEWGATE RESEARCH

22

After initial Info

OPINION ON WASTE MANAGEMENT OPTIONS AFTER INFORMATION

After being provided factual information on different options, respondents felt most positive about recycling and energy from waste; they were least positive about landfill



Q6. Please rate your feelings about each of the following waste management options. Please use a scale of 0-10, where 0 means 'extremely negative' and 10 means 'extremely positive'.
Base: All respondents – Weighted data (n=2,285)

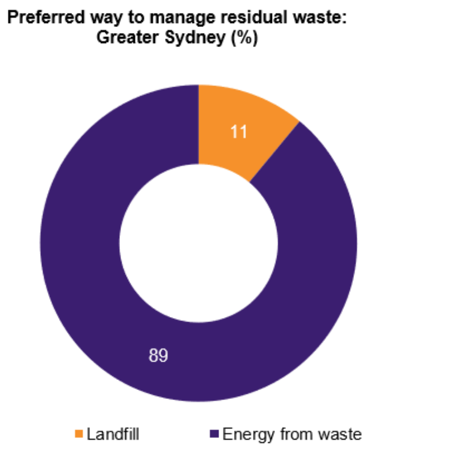
NEWGATE RESEARCH

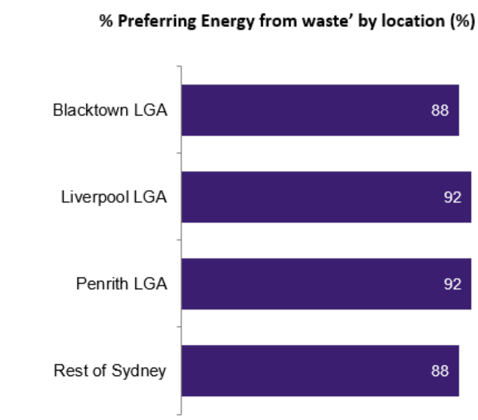
23

After initial Info

PREFERENCE FOR BEST WAY TO MANAGE RESIDUAL WASTE

Asked to choose between landfill and energy from waste as a way to manage residual waste, the vast majority had a preference for energy from waste





Q7 Avoiding and reducing waste and recycling are critical parts of NSW's waste management strategy. Which of the following do you think is the preferable way to manage residual waste (i.e. waste that's not reusable or recyclable)
Base: All respondents – Weighted data (n=2,285) Blacktown LGA (n=415), Liverpool LGA (n=275), Penrith LGA (n=395), Rest of Sydney (n=1,200).

NEWGATE RESEARCH

24

After initial Info

REASONS FOR PREFERRING EACH WASTE MANAGEMENT OPTION

Analysis of verbatim comments on the reasons for their preference show the extra benefit of energy provision, environmental benefits and reduced landfill are seen as the key benefits from EFW; many preferring landfill could offer little to substantiate their position

KEY REASONS FOR PREFERRING ENERGY FROM WASTE

- It's a positive way to deal with waste (providing benefits you don't get from landfill) (10%)
- It's more environmentally friendly (8%)
- It's a new source of energy production (7%)
- It will reduce/ control the amount of landfill (7%)
- It makes waste recyclable (5%)
- It will lower energy bills (4%)
- Landfill sites are filling up (4%)
- Landfill is not a good way to manage waste (4%)
- It's a far better option than burying waste (4%)
- *Not sure (10%)*

KEY REASONS FOR PREFERRING LANDFILL

- It's better than the other option (9%)
- It's cheaper (5%)
- It's a good way to deal with waste (4%)
- It's more effective and easy (4%)
- *Don't really know (37%)*

Q8 You chose [insert response from Q7] as your preferred option. Please explain your response, being as specific as possible.
Base: All respondents preferring energy from waste at Q7 – Weighted data (n=2,039)
Base: All respondents preferring landfill at Q7 – Weighted data (n=246)

NEWGATE RESEARCH

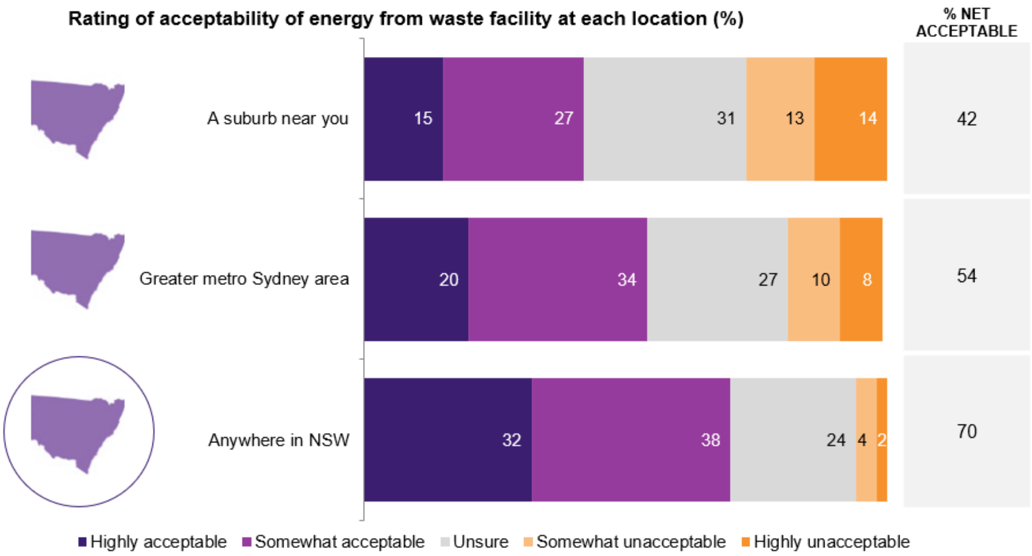
25

After initial Info

ACCEPTABILITY OF ENERGY FROM WASTE FACILITY (BASELINE)

Based on short descriptions of waste management methods, 42% of Sydneysiders said they would accept an EFW facility in a nearby suburb, and 70% who would accept one in NSW

Rating of acceptability of energy from waste facility at each location (%)



Q10 In principle, if an energy from waste facility were to be introduced in NSW, how would you feel about it being built in a suitable industrial location in…
Base: All respondents – Weighted data (n=2,285)

NEWGATE RESEARCH

26

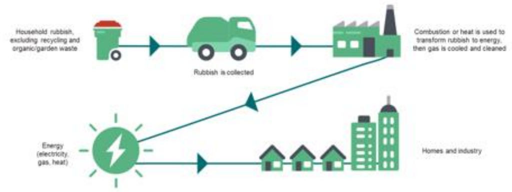
Further Info

AT THIS POINT, PARTICIPANTS WERE PRESENTED WITH THE FOLLOWING INFORMATION

How energy from waste works

Technology to extract energy from waste is being used safely around the world.

Energy from waste uses materials that cannot be recycled such as residual household waste including nappies or rags that currently go to landfill.



Examples of facilities overseas: Focus on Paris

- Three major energy from waste facilities are located in central Paris within a few kilometres of the Eiffel tower and the Louvre, and recycle local waste and supply energy to about 245, 000 homes.
- These plants prevent the release of 900,000 tonnes of carbon dioxide into the atmosphere each year.

Issey-les-Moulineaux 460,000 t/a

St-Ouen 630,000 t/a

Ivry-Paris XIII 730,000 t/a

Examples of facilities overseas

Energy from waste facilities are used in the United Kingdom, Europe, Asia and North America.

Amager Bakke, Copenhagen | Suffolk energy from waste facility, UK | Durham York Energy Centre, Canada | Minato City Waste Facility, Tokyo | Leeds energy recovery facility, UK | Covanta Facility, Dublin

NEWGATE RESEARCH

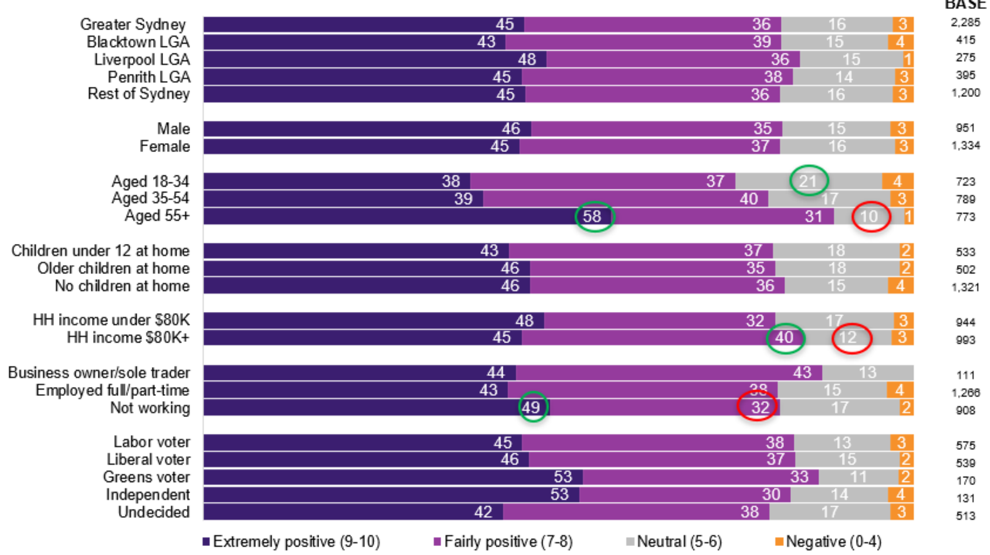
27

After further Info

PROFILING SENTIMENT TOWARDS ENERGY FROM WASTE

After further information, the majority of respondents were positive towards energy from waste, with those aged 55+ and not working significantly more positive

Rating of sentiment towards energy from waste (%)



Q11. Now that you have read a little more about the topic, how would you describe your feelings about energy from waste as a way of managing Sydney's waste that cannot be recycled? Please use a scale of 0-10, where 0 means 'extremely negative' and 10 means 'extremely positive'.
Base: All respondents – Weighted data (base on chart)

Significantly lower than other groups @ 95% confidence level

Significantly higher than other groups @ 95% confidence level

NEWGATE RESEARCH

28

After further Info

REASONS FOR RATING OF SENTIMENT TO ENERGY FROM WASTE

Analysis of verbatim reasons for positive opinions of energy from waste show it is seen as good idea that is better for the environment and working well in other countries; those who rate it poorly need more information and have questions and concerns

KEY REASONS FOR GIVING A POSITIVE RATING (7-10)

- Good idea/makes sense (12%)
- Better for the environment (8%)
- Working well in other countries (8%)
- Better than landfill (7%)
- More sustainable/ efficient waste management (6%)
- A positive way to deal with waste – provides a benefit (6%)
- Will reduce landfill/rubbish (5%)
- A new energy source (4%)
- The facilities look acceptable (3%)
- A good thing if it doesn't cause pollution (3%)
- It is future focused/for the future (2%)
- *Don't know (10%)*

KEY REASONS FOR GIVING A NEUTRAL OR NEGATIVE RATING (0-6)

- Don't fully understand it/need more information (7%)
- Neutral about it (7%)
- Makes sense (4%)
- Only good if managed correctly/non-polluting (4%)
- May cause pollution (3%)
- Seems like it would be expensive (2%)
- Positivity depends on location (2%)
- *Not sure (36%)*
- Other reasons (16%) – all one mention, including:
  - *Don't know how good it will be for the future*
  - *Where will it be sited?*
  - *How safe will it be?*
  - *Need to treat it like a nuclear reactor – keep it well way from the public*
  - *I want to know the carbon footprint*

Q12 And why did you give energy from waste a rating of [RATING FROM Q11] our of 10?
Base: All respondents providing a positive rating (7-10) at Q11 (feelings towards energy from waste) – Weighted data (n=1,871)
Base: All respondents providing a neutral/negative rating (0-6) at Q11 (feelings towards energy from waste) – Weighted data (n=414)

NEWGATE RESEARCH

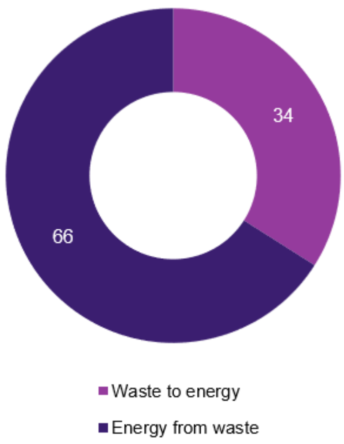
29

After further Info

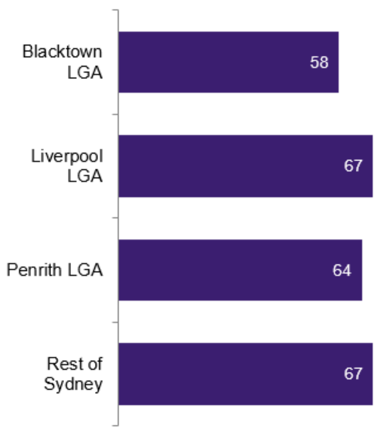
PREFERENCE FOR WHAT TO CALL ENERGY FROM WASTE

Two-thirds of respondents prefer 'Energy from waste' over 'Waste to energy'; this preference is reflected across all locations

Naming preference (%)



% Stating 'Energy from waste' (%)



Q13 Some call this process 'energy from waste' while others call it 'waste to energy' Which term do you personally prefer?
Base: All respondents – Weighted data (n=2,285)

NEWGATE RESEARCH

30

OTHER CONSIDERATIONS

DESIRED FORMAT OF ENGAGEMENT, PREFERRED BENEFITS AND PERCEPTIONS OF WASTE MANAGEMENT ORGANISATIONS

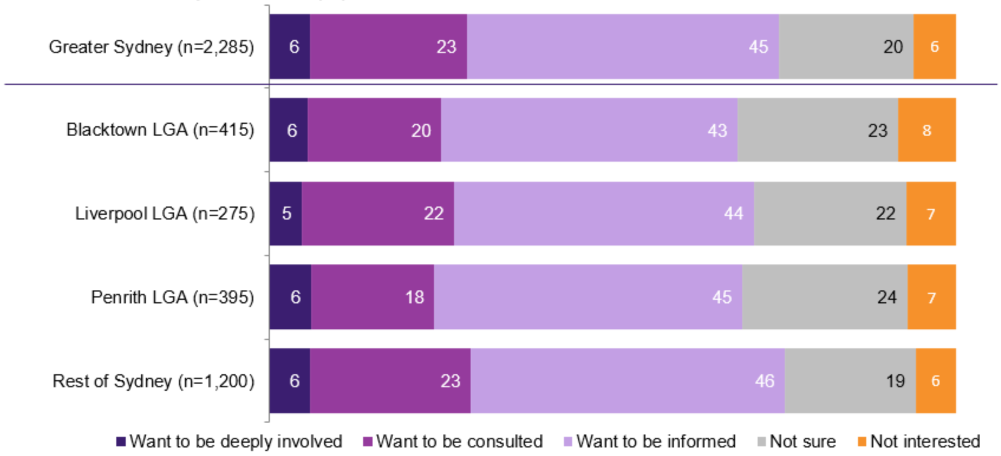
NEWGATE RESEARCH
NEWGATE AUSTRALIA

31

ENGAGEMENT PREFERENCES

Most respondents would like to at least be informed about plans for any local energy from waste facility; just under a third want to be consulted or more deeply involved

Information/ involvement preferences (%)



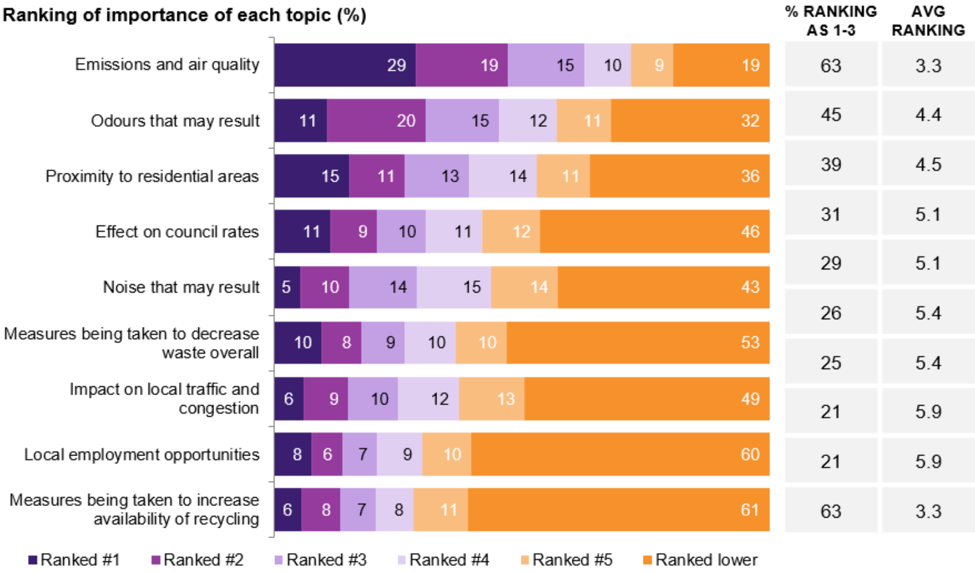
Q23. And how would you like to be informed or involved, if at all [about a planning energy from waste facility in your area]*?*
Base: All respondents – Weighted data (bases on chart)

NEWGATE RESEARCH

32

INFORMATION AREAS OF INTEREST

Emissions & air quality, odours, and proximity to residential areas were most important



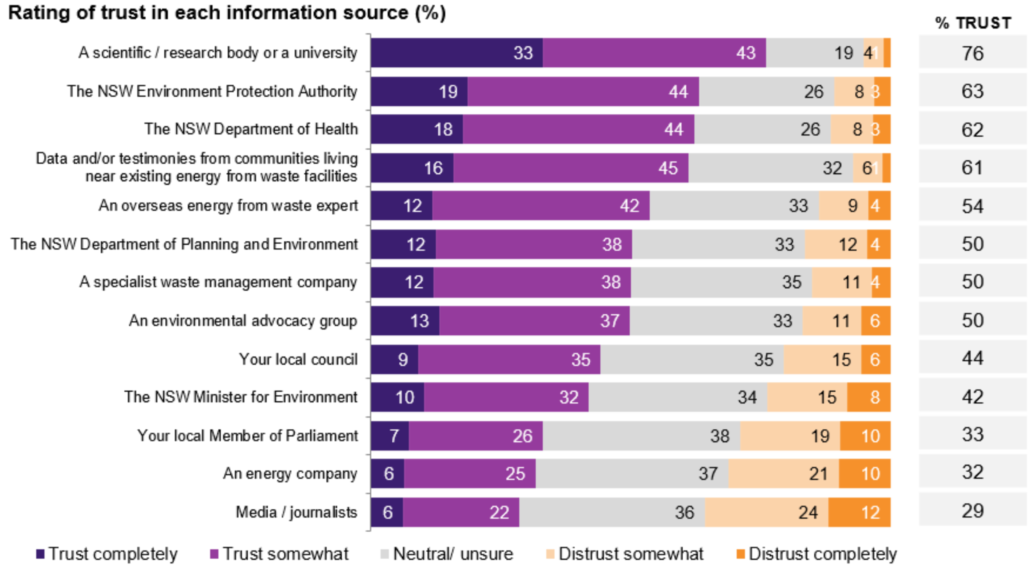
Q22 If an energy from waste facility was to be considered in your local area, which of the following topics would be of most interest to you to be kept informed on?
Base: All respondents – Weighted data (n=2,285).

NEWGATE RESEARCH

33

LEVEL OF TRUST PLACED IN DIFFERENT INFORMATION SOURCES

Scientific bodies & universities, the EPA, NSW Department of Health, and testimonies form communities living near existing EFW facilities are the most trusted sources



Q21 When it comes to providing the community with information, how much would you trust each of the following sources to tell you about energy from waste technology and issues with general household rubbish?
Base: All respondents – Weighted data (n=2,285).

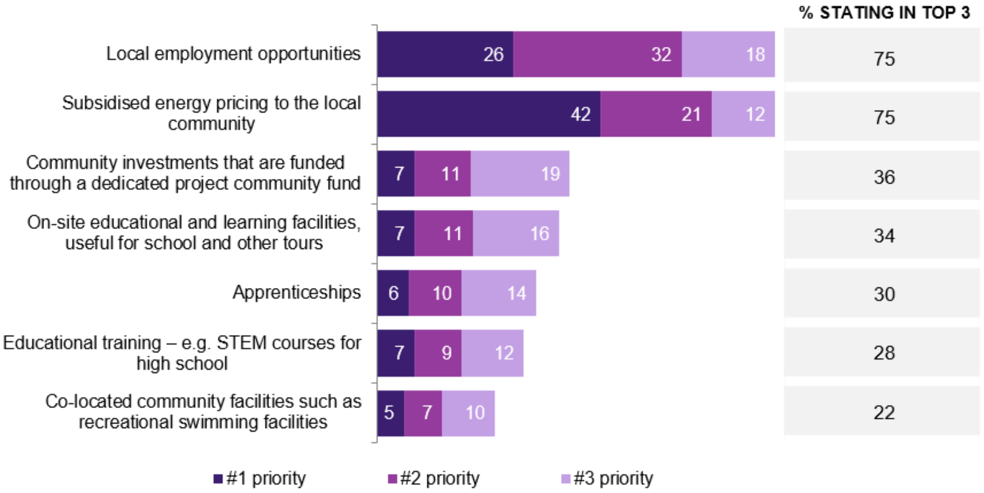
NEWGATE RESEARCH

34

PREFERENCES FOR COMMUNITY BENEFITS TO BE OFFERED

The majority of respondents wanted to see local employment opportunities offered to those in the vicinity of an energy from waste facility and subsidised energy pricing

Ranking of preferred community benefits (%)



Q20 Typically when energy from waste facilities are built in Europe, Asia and North America, they are planned in a way to provide benefits to both the greater population and the local community The following are examples of how this has been done in other countries Please read each statement and select the three that are most appealing to you, then rank them from 1 to 3, where 1 is the most appealing action, 2 is the second most appealing action and so on

Base: All respondents – Weighted data (n=2,285).

NEWGATE RESEARCH

35

CONTACT US

Our offices

SYDNEY
Level 18
167 Macquarie Street
Sydney NSW 2000
T +61 2 9232 9500

MELBOURNE
Level 10
120 Collins Street
Melbourne VIC 3000
T +61 3 9611 1800

CANBERRA
John McEwen House
7 National Court
Barton ACT 2600
T +61 2 9206 6900

BRISBANE
Level 13
Waterfront Place,
1 Eagle Street
Brisbane QLD 4000
T +61 7 3009 9000

PERTH
Level 7
191 St Georges Terrace
Perth WA 6831
T +61 406 244 356

APPENDIX B: SUMMARY OF ISSUES AND QUESTIONS RAISED BY STAKEHOLDERS AND THE COMMUNITY

Summary of categories

1. Project need and location	2. Waste management	3. Operational
• The need for the proposal • Site selection	• Best practice in waste management • Recycling • Resource recovery prior to combustion • Reducing waste	• Electrical generation process • Heat & Steam • Heat • Residual ash management • Water use in the EfW facility • Wastewater management • Timeframe for operations • Timeframe for approvals • How long will the plant operate for?
4. Environment issues	**Environment issues cont.**	**5. Community and social issues**
• Air quality assessment and compliance with international best practice/regulations in relation to air quality and health, odour • Carbon emissions and climate change • Hazardous materials • Fire • Cumulative impacts • Potential interference with aviation • Air quality during a bush fire? • Impacts on biodiversity • Meteorology • Landfill emissions comparison • Emissions monitoring and testing • Flue gas treatment • Human health impact	• What is the human health impact of the proposal? • Noise impact • Traffic impact • Visual amenity • Impacts on Drinking Water • Site licence, measuring and reporting • Site auditing, breaches, incidents	• Community benefit • Employment • Community involvement

1.Project need and location

CATEGORY	ISSUE OR QUESTION
THE NEED FOR THE PROPOSAL	
It is needed and should proceed	What can I do to help the proposal to proceed?
	Why doesn't the Council just go ahead with it?
	When will it be operational? How long will it take to construct? (comment in relation to the urgency for the proposal to proceed).
	Council is getting nowhere with planning over opposing political interests.
	Is it too expensive?
	Why has it taken this long?
The need for the proposal if the Next Generation proposal proceeds	Why do we need two energy-from-waste projects if The Next Generation one goes ahead?
	Is this the same type of waste to energy centre as the other one proposed?
	What is the difference between this proposal and The Next Generation Eastern Creek proposal?
	Is this the same type of incinerator as before that was not approved?
SITE SELECTION	
Consideration of alternative site locations	It's not right – it's too close to schools and council. Why not choose a location in Campbelltown or the eastern suburbs?
	Will the 25 alternative sites be listed in the EIS and did you investigate other technologies such as anaerobic digestors?
	What alternate sites were considered?
	Why can't you put the site in North Sydney?
	Why can't it be built somewhere else?
	The Centre should be in a location that is more remote from people.
	Why not select a regional location, for example where the coal mines are closing down, because they are receiving government support and grants?
	Was a coastal location considered (with sea breezes)?
The choice of this location	It is too close to residences – there will be contamination and issues with steam/smoke emissions.
	Why does it have to be built in Western Sydney?
	We don't need more industrial buildings in Western Sydney.
	Geographically the area is not appropriate – residents need to be the priority.
	Its located in Blacktown which is the lowest density suburb in Sydney – why shouldn't it go in a higher density suburb with more waste?
	Is the site on Wallgrove Road? In a diagram it looks like it is next to Prospect Dam.

2.Waste management

CATEGORY	ISSUE OR QUESTION
Best practice in waste management	We do not understand the technical issues (associated with energy-from-waste) and the impacts from this form of technology. Is this process incineration and how is this considered best practice waste management? The provision of failsafe community information – are the Centre mechanisms to a basic/standard level in this regard or are they best practice? What is anaerobic digestion and how can it dispose of waste and is it being considered? Does Blacktown Council compost? What is the size of the facility and is that an appropriate size? How much would it cost to get [a waste management result] as good as Germany? In England there are too many (EFW) facilities, which has resulted in a number of them having to burn recyclable products [not a desirable outcome]. Regarding technological changes, do you foresee changing technology trends and how can the centre adapt once it is built? Good idea because landfill is a bad idea but this is still not a great option. Can you provide a breakdown and comparison of different energy-from-waste technologies, including anaerobic and organic reactors? What is 'best practice' today and tomorrow? Is there a standard definition of best practice?
Recycling: **The need to maximise the amount of materials to be recycled**	I have read that waste-to-energy stops people looking for opportunities for more recycling. Is this correct? What investment will Cleanaway make in helping people to recycle? How long will it take to fill a bag of waste? (in relation to waste from landfill)
Resource recovery prior to the combustion process	Will the waste be sorted before burning? Red bins are being used incorrectly. There is a need for further sorting post red bin collection. How will this be addressed? I was told that you will not be doing any sorting and that everything in the red bin will end up in the incinerator. How do we know what's coming out of the facility if we don't know what's going in it? [in reference to the need for red bin waste sorting] How much is pre-sorted before entering the Centre and the combustion process? Is there any sorting of red bin waste? How is incoming waste policed and what governance is in place to manage the red bin waste – removal of dangerous items [before combustion]?

	Red bins will still be incorrectly used, and further sorting will need to be applied. How will you action this?
Reducing Waste: **The Centre's role in reducing waste to landfill**	How much landfill do we want in the future? What's coming out of it? (in relation to producing different types of waste to be disposed of) What are the other options for dealing with landfill? On the sign at your site, you mention 1.6 million tonnes per year, but you plan to only take 500,000 tonnes? Why not accept more waste at the Centre and reduce landfill? Is there a section in the WSERRC proposal document about your intention to send nothing to landfill? What strategies are going to be in place to combat living a "throw away" lifestyle (in relation to the generation of waste) and single-use culture? Sustainable packaging and consuming less would care for the Earth more than waste-from-energy.
Waste contracts	Will there be a change in the bin system? (for households) Will wider Sydney rubbish be going to the plant? Will participating councils have a contractual obligation to provide a minimum volume of red bin waste for energy-from-waste incineration?

3.Operational considerations

CATEGORY	ISSUE OR QUESTION
Electricity generation	Will the proposal bring the price of electricity down for residents? Is there a need for more electricity generation? [the energy creation could be a marketing ploy for the WSERRC proposal] What are the electricity benefits in relation to the reduction in waste? We need a better understanding what all this means for energy. How does it generate electricity? Does this mean Council will make electricity cheaper for us? Is this a similar technology to solar energy? How much waste will the centre burn and how much energy will it generate each year? How does energy-from-waste compare to coal to the creation of energy? Are there solutions for the heat that is created?
Heat: **Effect on ambient heat in Western Sydney**	How far would the heat from the centre travel? Will the heat affect the air temperature – especially in a 1km radius around the Centre?
Reuse of heat and steam	Can the heat and steam that is produced also be re-used somewhere nearby?
Residual ash management	Will the remaining waste from the Centre be buried or burnt? It would be good to find a use for the bottom ash rather than disposal of it.
Water use in the EFW centre	Why recycle the waste-water on-site? What benefits does this provide? Water recycling process on site – how does it work; is the water filtered? Concern about toxicity of the water products that are onsite.
	Provide more information about the wastewater from the site and how it is processed/managed and released.
	Once disposed, would the waste-water affect the PH of water supplies?
Timeframe for operations	Will the centre run 24 hours? If the longevity of the plant is only 20 to 30 years, what is the plan for the facility then? Do you foresee changing technology trends being adapted on the go? Is this even possible after the facility is built? How long is Cleanaway looking to sign a contract to keep this centre open?
Timeframe for construction	What is the timeframe from approval of the WSERRC to operation?

4. Environmental issues

CATEGORY	ISSUE OR QUESTION
AIR QUALITY ASSESSMENT AND COMPLIANCE WITH INTERNATIONAL BEST PRACTICE/REGULATIONS IN RELATION TO AIR QUALITY AND HEALTH	
Emissions and air quality (generally)	Does the Waterloo/Alexandria incinerator generate a lot of pollution? I am worried about breathing in smoke created as a product of the process of burning. What are the air quality risks to the community? What is the generation of additional local pollution (from the facility and from the waste trucks). What happens to air quality if you burn a toxic material? Why is it this close to residents when there will be air pollutants? When rain evaporates, do pollutants and emissions go with the water and re-enter the air? Regarding the trucks coming to this site – what is the impact on local air quality – assuming they are diesel vehicles? Is the [combustion] process similar to a crematorium? What will the emissions be for the facility over time - will they change day by day or over time? What will the effects be on the air quality in the Blue Mountains? What is the difference in the air emissions and the heath impact between this proposal and The Next Generation proposal, including feedstock; filter bags; technology? The Prospect region is already polluted and the incinerator will add to pollution levels. Is there anything we can do to reduce that pollution? This will be built before the Western Sydney Airport, and you don't know the additional impacts this will add to your air quality issues and we cannot know the increased toxic effect [that is] likely as there is nothing to measure it by yet?
	What is the volume of the emissions and the particulates that will be released?
Odour impact	There is already bad smell from the tip/s in the region. These odours are exacerbated during certain winds.
	Is it going to smell? Is it true there will be no odour?
	What's coming out of it and what will the smell be?
	Can information be provided about other facilities internationally – do they produce odours?
	Concerns that even if it is 'chemically safe' there are other facilities around that are also held to a high standard yet emit a smell. How can we be assured there is no smell?

	How will the smell be tested if it's not yet constructed?
	How are you going stop pollution and smell travelling in the area? (i.e. methane, and chemicals with hidden toxicity)
Compliance with international best practice/regulations **The overseas examples provided**	Do all new plants use this [moving grate] method?
	Aware of other facilities internationally
	Understand they are established overseas, but are these facilities supported locally? (i.e. by Council)
	How will the facility compare to the Zurich EFW centre?
	Are incinerators being decommissioned around the world?
	Can we have comparative health reports that compare the rate of health problems around current energy-from-waste plants as approved, to other local areas in the same country but much further away?
	Is there any facility in the world that has been in operation for 35 years or shut down and has studies on its health impacts?
	Has the UK been trying to change the EU standards because they cannot meet them?
	How close are houses to each of the international energy-from-waste examples of best practice shown on your website?
	Will European best practice be a part of the approvals for this site?
	When comparing/benchmarking with other sites, do you consider that Sydney is in an air basin and that comparative sites are not?
	If there are multiple years of monitoring for the Dublin [reference] site – are you taking the worst-case scenario from that facility?
The *types of pollutants* that will be emitted into the air	What is in the flue gas, compared to every-day air? Is there any methane produced? Is the following present and will it be measured – Benzene; Formaldehyde; Tolvene; Xylenes; PHAS; Benzolalpyrene? What goes through or escapes out the stack from the filter bag process? Does any ammonia come out? How does the hydrated lime leave the facility? Is it emitted? More information is requested about what goes in versus goes out and how. What specific chemicals come out of the stack after the waste has been burnt? What are the outputs of ammonia and NOx from the Centre?
Carbon emissions and climate change	We need to understand the CO_2 reduction benefits described, and the process of calculating this.

	Regarding diesel fuel and the impact of the trucks driving to the facility on local air - is there an opportunity to increase the use of electric vehicles associated with the site?
HAZARDOUS MATERIALS	
The production and disposal of fly ash	How is burning waste and the production of hazardous fly ash sustainable?
	What is the composition of the hazardous materials landfill in Kemp Creek; how are hazardous materials at this site managed to ensure community protection?
	What is the capacity of this hazardous landfill facility – how long will it last?
	How often do you think by-products from this facility will need to be put into landfill?
	What is the disposal procedure for the used filter bags (that contain highly toxic material)? Do they go to landfill?
	Where is the restricted landfill for the flue gas ash? Where are hazardous by-products and landfills specifically positioned in Sydney?
Hazardous chemicals	What happens to volatile organics, volatile heavy metals and organometallic compounds?
	What role does hydrated lime play in the emissions management system? It could be a short-term fix but for the long term is considered to be dangerous. Hydrated lime is known chemical used to reduce the odour from ammonia. Has serious effects on skin, eye, breathing and digestion. Could also increase PH level of water. How will the safety measures apply to the facility before, during and post [the use of this hazardous material]? Hydrated lime – that's a chemical known to cause allergic reactions and respiratory conditions. It contains silica – a known carcinogen. How is this removed in the emissions cleaning?
	Is there a substitute for using hydrated lime?
	Silica dust clouds are of concern.
	How can the project accurately forecast [air] impacts with different streams of waste in the red bin? Surely it's not possible to check all chemicals and all levels that exist in products – how is this going to be monitored and [this needs to occur] often?
Fire	How is fire risk managed onsite?
	If there is a bushfire, will the centre catch fire?
	Bushfires and the Western Sydney basin – how does this affect local air quality – how does this trigger a breach in emission levels and ambient air levels?
CUMULATIVE IMPACT	
Cumulative impact with Western Sydney Airport	What will the emissions reading be for the facility on top of the Western Sydney Airport air quality impacts/emissions?
Potential cumulative impacts	Concerns about cumulative health effects (and not knowing what these are for years to come), land degradation and water contamination – how will all of this be monitored

with other proposals	and what are the reporting mechanisms? [The community has a] desire to minimise potential risk factors before they happen.
Extreme events	How do we know the combination of pollutants from bushfires and other extreme events combined with this facility will not be harmful?
	Are the waste load limits adjusted according to existing air quality?
Potential interference with aviation	How was potential impact on the protected airspace of Western Sydney Airport assessed?
Impact on biodiversity	How will air emissions settle on nearby plant life. Will the emissions affect plant production and consumption of plants by humans and animals? How will plants and animals be impacted by the proposal? Will this affect the animals at Sydney Zoo?
Meteorology	More information is requested on the air inversion layer in Western Sydney.
	The air quality 'swirl' as described in the Metropolitan Air Quality Study needs to be addressed in the meteorological model.
	Information on the Sydney air basin swirl (or circular motion due to it being a basin) to be provided to the community.
	Assessment of the issue of temperature inversions.
	How is the flue gas distributed in the atmosphere once it has been emitted?
Landfill emissions comparison	In comparison to landfill, what's the equivalent amount of emissions and pollutants that are produced?
The emissions testing and monitoring process	How is the air quality to be tested – especially in relation to the local area that contains stagnant air?
	How will they ensure the filters are state-of-the-art for the sake of air quality? The adequacy of the process to clean emissions.
	We understand that threshold chemicals are measured. How do you measure the chemicals for non-threshold chemicals, to provide reassurance for people living near the facility?
	How is the creation of POP's being monitored?
	How often do you monitor emissions?
	How often do you monitor each emission component?
	What method is to be used for continuous emissions monitoring?
	Who monitors the monitors? How will we know if there has been a breach?
	What are the smallest particles in the air and what occurs when they land on food.
	Will the air studies be localised (i.e. take into account) Western Sydney air conditions?

	The existing air quality is already bad in Western Sydney – is this considered in the emissions testing process?
	Western Sydney is not coastal, it is inland – the air quality sample data needs to be taken over a large radius from the facility.
	How do you know what the (chemical) compounds will be in the cleaned flue gas?
	Could there be chemicals coming out of the stack that are more toxic than the ones you are measuring?
	Can you compare the air quality testing results with the existing air quality stations in both Prospect and St Mary's?
	Will you build more background air measuring stations around the site?
	What is the model being used by Cleanaway that Aleks referred to, that he was involved in setting up in his government role and superseded the excellent research and model developed by Thurley et al and their research?
	Will there be 24-hour monitoring and 24-hour reaction to a problem on site?
Flue Gas Treatment	How is the air cleaned and cooled?
	Can you name a bag filter product so we can have a look?
	What happens with a bag tear? How long do they normally last?
	Is the bag emissions filtering process used all over the world in similar facilities, or is this new?
	Why isn't there water cleaning/capturing the gases as they leave the stack?
	Where does the steam from the turbine fit in into the filtering system?
	More information is requested on the chemicals used in the scrubbing process?
	Are you doing a two-stage filtering or single pass filtering process?
	What happens if one of the parts of the emissions cleaning system (of which there are several discrete parts) is deficient/not functioning? Can the emissions be captured and re-circulated/re-cleaned?
	Regarding the maintenance and cleaning of the emissions management systems – how often are they cleaned; what water is used; where does the by-products go; is the system self-cleaned, i.e. automated?
	How often would you shut down the facility to undertake repairs?
	How efficient is activated carbon in removing toxic organic, volatile metals, organometallics etc
	How can you forecast any kind of emissions impact before the facility is functioning and you can test the impact on actual results?

	Is the filtration system adequate to remove fine particles, are they are fully captured by the centre's air cleaning system? What systems are in place to filter fine particles in the facility and ensure they don't get out?
	What measures are in place to protect the community from a breach in the treatment process?
	Will you ensure the facility always has the latest safety technology?
HUMAN HEALTH IMPACT	
Community health data	What community health data is available?
	Is there data per area of capita? Cancer rates are affected by many things, smoking, alcohol, work, environment etc. Will we have current data of CPOD< SKIN, CANCER etc presented.
	Will the cancer rates in Western Sydney be examined?
Human health impacts	What are the health risks?
	Are there cancer risks as a result of the air emissions?
	How are the unknown health impacts addressed?
	The concept of residual risk to human health and certainty around human health impacts.
	What effects will the air quality have on an asthmatic in the area?
	Can the assessment provide certainty regarding the impacts?
	What guarantees are there that it won't affect resident allergies?
	Do you consider long term community exposure to pollutants [from the Centre]? How do you know the percentage of poison dosages?
	What are the community health protection measures if and when something breaks down?
	Are there safety issues that have occurred in overseas energy-from-waste examples that we should learn from?
	Concern about the air emissions resulting in the accumulation of waste in the food cycle– are the risks to be assessed in the EIS?
	Will the proposal lead to: · Irritated eyes, nose and throat · Worsening asthma and lung diseases such as chronic bronchitis (also called chronic obstructive pulmonary disease or COPD) · Heart attacks and arrhythmias (irregular heartbeat) in people with heart disease · Increases in hospital admissions and premature death due to diseases of the respiratory and cardiovascular systems · Flu-like symptoms such as headaches, dizziness, disorientation, nausea and fatigue · Chest pain in people with coronary heart disease
	Will the proposal lead to long-term exposure conditions including: · Reduced lung function · Development of cardiovascular and respiratory diseases · Increased rate of disease progression · a reduction in life expectancy

	· Potentially serious health effects on unborn babies (birth defects) when exposed to high levels · Cancer
Future community health data	How will community health be measured in the future? Medical records data and classification of diseases depends on operator input and can miss underlying health issues. This is a complicated matter, from time living in a region to lifestyle, unknown health impacts now and after the proposal begins.
Noise impact	What sound will it make?
Traffic impact	There's already excessive trucks and traffic in the area. How much extra traffic will there be?
	Will there be impacts on transport?
	Will this incinerator generate more traffic?
Visual amenity	What will it look like?
Impacts on drinking water	Sydney's drinking water may be affected. Prospect Reservoir and Warragamba Dam are not far away, and Prospect is an emergency water supply.
	Would the air emissions affect nearby farms (rainfall) and subsequently enter food supply?
	There were concerns about waste accumulating in the food cycle as a result of using recycled waste-water for other purposes.
	Prospect Reservoir – what are the impacts on human drinking this water supply?
	Birds and wildlife drink from these water sources. What are the health risks for these animals using this water source?
Site licence, measuring and reporting	What sort of conditions can the EPA include in the site's licence?
	Does EPA have any guidance on what [monitoring] tests you use?
	The NSW air emission standards are not (strict) good enough.
	The data is sent away for testing – does this mean we will wait up to three months to know of any breach? Further, samples have in the past been compromised – what measures are in place to protect this process?
	How would Cleanaway be held to account in the future when running the facility?
	Will the data set that is collected be live (on the website)?
	What and where will be the sensors for monitoring [ambient] air quality? (they should not be run off solar power)
	Are air quality monitors being installed in other suburbs?
Site auditing; breaches; incidents and reporting of incidents	Will they have an Air quality community consultative committee (AQCCC) post approval and an Environmental Management Plan (EMP) developed after the EIS?
	How do we know that the waste facility is reporting all incidents and how do the public know that the data they report is true and correct?

	If the pollutants exceed their limits what happens?
	Will incidents and non-conformances be reported to the community?
	What are the penalties for breaches? Are they off a sufficient size to make a difference to the company?
	Do the fine sizes increase after numerous breaches of the Centre's air quality limits?
	What happens to fix any detected exceedance?
	Does the EPA undertake random site inspections?
	How often will the site be required to be audited by [the] EPA according to regulation?
	Can you simply turn off the alarm?
	Self-monitoring by WSERRC operator is problematic, what sort of oversight is there to this? Operator error, who says? Do we rely on self-reporting? People by nature avoid an error becoming known, so what is in place to protect the community from non-disclosure? What is in place to stop this from occurring at every stage of the process?
	If an incident occurs, does the EPA come and inspect the site?

5. Community and social issues

CATEGORY	ISSUE OR QUESTION
Community impact	The facility could affect a lot of people (referring mainly to location and emissions).
	Is this the proposal that everyone doesn't want?
	Will you consider the volume of children living nearby that would breath in the chemicals?
	It's close to about 13 schools and preschools. How do we know there won't be any operational effects?
	The location of personal property [near] to the facility and the generation of fumes.
	How close are international examples to residents/built up areas?
	The centre shouldn't be this close to homes – it could have an overall impact on the quality of life.
Impact on property values	Will land lose value in the area?
	Will there be compensation for the devaluation of properties?
	Would like to know if it will affect real estate value of both houses and land for both short and long term.
Community benefits	What benefit will there be to the residents' back pocket? (i.e. home rate benefits)
	Will it bring down Council rates? Or Will ratepayers get a discount?
	Will there be a financial benefit to landowners?
	What has taken something like this so long?
	Will it lower electricity prices for the community?
	Are there community investment options?
	Will the electricity benefit the local community?
	Is this supported by council? Is it cheaper to manage waste than landfill?
	How does council pass on the electricity cuts?
Employment	What number and type of jobs will be generated by the proposal? Construction and operation.
	Will the jobs be for locals?
Adequacy of the EIS assessment	Sceptical about the planning process and the potential for the community to influence.
	Lack of trust in government processes.
	Will there be post approval assessments after the EIS?
	How are the assessment guidelines set?
	What is the process for a change in the regulation process?
	How does the public get involved?
	How will responses to community questions to the EIS be shared?

CATEGORY	ISSUE OR QUESTION
Community consultation method/activities	What are the ongoing engagement opportunities.
	Wording and messaging for the proposal is not clear (referring to misleading).
	Not enough information sessions.
	How do you register for the EIS?
	How will community engagement take place with COVID19 circumstances?
	What is the level of community opposition to this proposal?
	We don’t think enough people have heard about the proposal, what are you doing to consult more people?

APPENDIX C: COMMUNITY REFERENCE GROUP DESCRIPTION

A Community Reference Group (CRG) will be established during construction and operate across the life of the WSERRC. The purpose of the CRG will be to facilitate long-term relationships with the community, providing a forum for genuine discussion of construction and operation of the facility, community concerns, information requests, and local initiatives and partnerships.

The CRG will meet the intention of a Community Consultative Committee, as described in NSW Government guideline Community Consultative Committee Guideline State Significant Projects January 2019 an EOI would be advertised locally to allow interested community members to submit an application for consideration.

In addition to general CRG duties, we would anticipate the CRG would manage the allocation of the community funding package in accordance with an agreed governance framework. The CRG would be made up of community representatives, local stakeholders and council representatives, and meetings would be facilitated independently. It is likely that this group would be refreshed every 2 years to ensure that a variety of community and other stakeholders are given the opportunity to participate

The group would ideally be made up of:

- 8 to 10 community representatives
- Blacktown City Council Mayor or representative (the project would welcome Blacktown Council involvement as the host council)
- EPA representative
- Project representatives
- An independent facilitator

Contact Details

Newgate Engage
ABN 38 162 366 056
Level 18, 167 Macquarie Street
Sydney NSW 2000
T: +61 2 9232 9500
E: sydney@newgatecomms.com.au
W: www.newgatecomms.com.au

Appendix G

Information relating to the Draft Voluntary Planning Agreement (VPA)

Western Sydney Energy & Resource Centre (WSERRC)
Letter of intent to enter into Voluntary Planning Agreement (VPA)

Cleanaway and Macquarie Capital are planning to jointly develop an energy from waste (EfW) facility known as the Western Sydney Energy and Resource Recovery Centre (WSERRC) (the proposal) located at 339 Wallgrove Road, Eastern Creek – which is located in the Blacktown Local Government Area.

The proposal will be designed to thermally treat up to 500,000 tonnes per year of residual Municipal Solid Waste (MSW) and residual Commercial and Industrial (C&I) waste streams that would otherwise be sent to landfill. This process would generate up to 58 megawatts (MW) of base load electricity some of which would be used to power the facility itself with the remaining 55MW exported to the grid.

Following our recent meetings and negotiations with Blacktown City Council, Cleanaway and Macquarie Capital are pleased to advise that should the project be granted planning approval to proceed, the project offers to enter into a Voluntary Planning Agreement (VPA), based on the terms attached.

The proposed VPA contributions over the life of the facility are to fund public benefits and projects in the Blacktown Local Government Area. These projects may include::

- Environmental projects aimed at reducing urban heating, revitalisation of waterways and connectivity of green spaces.
- Sporting infrastructure upgrades to facilities including lighting and women's facilities.
- Community recreation and open recreational spaces.
- Education on waste avoidance, reduction and recycling projects.
- Construction of waste recycling and/or reuse facilities to further enhance Council's ability to ensure recycling and reuse of waste projects within the community

Cleanaway and Macquarie Capital confirm our commitment to the Blacktown Local Government Area and as demonstrated through the offer are keen to work with the community to enhance the quality of facilities in the area.

We note that the offer for a VPA is separate to the community funding package proposed for Western Sydney which is valued at $150,000 per year.

Draft Term Sheet for a waste royalty payment under a proposed VPA for the Energy from Waste plant at 339 Wallgrove Road, Eastern Creek

The comments herein are provided to aid commercial discussions between the parties and are subject to:

- BCC legal advice
- Any agreement being subject to Council formally resolving a position.

	Cleanaway's proposal
Proposal	Cleanaway and Macquarie Capital are jointly developing a thermal energy from waste facility with the capability to process 500,000 tonnes of residual waste per annum and generate 58MW of electricity. The facility is to be located at 339 Wallgrove Road Eastern Creek (Lot 1 DP 1059698), within the Blacktown LGA on land owned by ACN 635 427 262 Pty Ltd as trustee for the Green Waratah Project Trust.
Parties	Blacktown City Council and Cleanaway Operations Pty Ltd (ABN 40 010 745 383) (***the applicant***).
Term of agreement	The term of the VPA and associated monetary contribution is from the date commercial operations commence (where commencement is defined as the commencement of commercial operations based on first receipt of paid acceptance of waste) (the ***commencement date***) and the completion of the project. At this stage the completion of the project is an unknown date but reflects the time at which the facility is no longer accepting waste. The applicant anticipates the facility will operate for a minimum of 30 years based on its design life (***completion date***).
Timing of payments	The applicant is required to pay the royalty fee to Blacktown City Council on a quarterly basis and royalty payments must be made within 45 days of the previous quarter's end. Payments to Blacktown City Council are to be made from the commencement date until the completion date.
Monetary contributions Accept that rejected waste is not included in the royalty fee.	The applicant will pay Blacktown City Council $X per tonne (***the royalty fee***) of waste accepted (***accepted volume***) and processed at WSERRC. Waste that is rejected from the facility (***rejected waste***) will not contribute towards the volume that attracts the royalty fee. The monetary contribution will be calculated as **accepted volume x royalty fee.** Total payments over the life of the project are anticipated to be $x (***total payments***). This is an estimate only
Adjustment to monetary contributions	If during the development approvals process additional development contribution requirements (***additional payments***) are placed on the applicant by the DPIE, IPC or other regulatory body (***approving party***), the total royalty payments to be paid to Blacktown City Council under this VPA over the 30 year design life of the project will be adjusted downwards so that the net present value of the total payments with the additional payments over the life of the project are the same value.
Records	The payment of the royalty fee must include a reconciliation of weighbridge data to support the accepted volume of waste received at the WSERRC and reflect evidence of any rejected waste volume.
Blacktown City Council use of funds	The royalty payments will provide funding for public amenities and public services in recognition of an increased demand in the Blacktown LGA resulting from workers at the facility and to offset any impacts of the project on the local community. Monetary contributions paid to Blacktown Council must be used to fund projects that fit the following criteria: • Environmental projects aimed at reducing urban heating, revitalisation of waterways and connectivity of green spaces.

	• Sporting infrastructure upgrades to facilities including lighting and women's facilities. • Community recreation and open recreational spaces. • Education on waste avoidance, reduction and recycling projects.
Recognition of WSERRC's contribution	In recognition of the public benefits provided by this VPA WSERRC will be recognised for the projects it has funded. This may be achieved by media statements or plaques on infrastructure funded by the WSERRC or other methods as agreed.