

## Chapter 25

# Evaluation and conclusions

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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<sub>2</sub>-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 ( $\text{NO}_x$ ) as it achieves the BREF limits for  $\text{NO}_x$ , 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  $\text{NO}_x$  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&amp;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	<p>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.</p> <p>The proposal is consistent with the principal aim of the WARR Strategy <i>'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'</i>.</p> <p>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.</p> <p>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.</p>
(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 <i>Protection of the Environment Administration Act 1991</i> can be found in <b>Section 25.3</b> below.
(c) to promote the orderly and economic use and development of land	<p>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.</p> <p>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.</p>
(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.