Blacktown
City Council

Your ref: SSD-10395
File no: MC-19-00006

16 November 2020

Department of Planning, Industry and Environment
GPO Box 39
SYDNEY NSW 2001

Attention: Sally Munk

Dear Ms Munk,

SSD-10395 – Proposed Energy and Resource Recovery Centre at 339 Wallgrove Road, Eastern Creek

Thank you for your correspondence dated 28 September 2020 about the above SSD application, requesting our comments on the exhibited Environmental Impact Statement (EIS).

We understand Cleanaway (the applicant) seeks to construct and operate an energy-from-waste facility that can generate up to 58 megawatts of power by burning up to 500,000 tonnes per year of residual municipal solid waste and residual commercial and industrial waste. This is a State Significant Development proposal under section 4.36 of the *Environmental Planning and Assessment Act 1979*.

Under my delegation, on behalf of Council, we object to this proposal until all our concerns detailed in the attached document are comprehensively addressed and the necessary information is referred back for our further consideration before any determination is made.

Council reserves the right to add to our submission following Council's consideration of our officers' comments at its Ordinary meeting on Wednesday 25 November 2020.

We also ask that you please consider the community submissions referred to you by us during the exhibition period.

If you would like to discuss this matter further, please contact Glennys James PSM, Director Planning and Development, on 9839 6201.

Yours faithfully

Kerry Robinson, OAM
Chief Executive Officer

Blacktown City Council submission to exhibited proposal for an Energy and Resource Recovery Centre at 339 Wallgrove Road, Eastern Creek (SSD-10395)

1. Overall and general requirements

a. We have engaged GHD to provide an independent review of the EIS and specialist reports for the Cleanaway Western Sydney Energy and Resource Recovery Centre (the WSERRC). The key findings of this review and our concerns and objections are summarised below. The GHD report is included at Attachment A.

- **Key issue 1 - Planning**

  The site is located within the Western Sydney Parklands (WSP). State Environmental Planning Policy (Western Sydney Parklands) 2009 (SEPP WSP) is the principal environmental planning instrument controlling development and land use planning in the WSP. The site is unzoned and the proposed development is permitted with consent.

  The EIS has not adequately addressed the provisions of the Parklands SEPP to enable clear demonstration of the beneficial social and economic outcomes to Western Sydney of the proposed development in this location. This raises questions about the suitability of the site and whether the proposed development, in the proposed location within the Parklands, is in the public interest. In particular, whether sufficient consideration has been given to the Aims of the SEPP (Clause 2) and the Clause 12 matters to be considered by the consent authority. Approval of the proposed plant will permanently alienate this land from the Parklands and not contribute to the recreational needs of Western Sydney residents.

- **Key issue 2 - Technology and design**

  Whilst the type of technology to be used is broadly nominated, and architectural plans of the buildings and layout plans have been provided, there is a possibility that the plant layouts may need to be modified once a technology provider is nominated and actually designs the facility. Normally the technology provider would be involved in preparing the plant design for the EIS.

  A concept design report and drawings should have been prepared for the EIS by the nominated technology provider. An architectural design report has been prepared, and some civil design drawings are provided, but there is no concept design report about the technology itself, which is the most critical aspect of an energy from waste facility.

  The lack of a concept design report from an energy from waste specialist consultant, and with technical input from a nominated technology provider, means that the justification for the technology, and the details provided about how the plant would operate, are only very high level.

Determination of this proposal could possibly need to be deferred until such information is available, and air quality and health risk assessments can be confirmed as being in alignment with the adopted equipment from the nominated technology provider.

The NSW EfW Policy calls for a secondary combustion chamber to be provided where 'the temperature should be raised to 1,100°C for at least 2 seconds after the last injection of air', if chlorine levels are expected to be above 1%. The EIS states that as the average chlorine content for the intended feedstock mix remains less than 1%, the design temperature of 850 degrees Celsius is appropriate.

The results of waste audits and laboratory testing of Municipal Solid Waste (MSW) and C&I waste received at the Erskine Park transfer station in 2019 are used to suggest that chlorine levels in the feedstock will not exceed 1% in any case. As no sampling and analysis methodology and information was provided in Technical Report C and Technical Report E, it is impossible to assess how representative the data is.

Given the intent to obtain sufficient waste to run the facility through winning future Council (MSW) contracts sources of waste, and how close the chlorine levels (0.94 %) in MSW are close to 1%, it would seem prudent to make provision for a secondary combustion chamber in the design, in case it is required. There is no provision made for this in the plant design.

The EIS also states that some of the waste streams will be subject to sorting and active removal of polyvinyl chloride (PVC), although the extent to which this would be undertaken (some or all waste streams) is not clear. It is stated that this would involve building new facilities at either the Erskine Park transfer station (and extending it), or elsewhere. No firm commitments are made, and also it is noted that the feasibility of extending the existing transfer station is not discussed, but it is noted in the EIS that this would require separate approvals. Without guaranteed approval of facilities that can achieve this sorting and removal, we question the validity of any approval for this EfW facility until there is a guaranteed way by which this can occur.

- **Key issue 3 - Reference plants**

  Despite dozens of EfW facilities operating around the world, only two reference facilities have been nominated (Dublin, Ireland and Filborna, Sweden). However, Table 5.7 of the EIS only compares the waste types with the Dublin plant, not the Filborna plant. Whilst the waste types are broadly the same, no detailed comparison of waste composition (by %) with the Proposal is provided. Also, there is not enough information provided about the Dublin plant to be able to verify whether the waste types are actually the same.

  The two nominated reference plants have different technology providers. The Dublin plant uses Hitachi Zosen Inova technology, whilst the Filborna plant uses Babcock Wilcox technology. No assurances are provided in the EIS that these technology providers or equivalently experienced providers would be used. Hence, other less reliable or proven technology providers could be utilised instead, if the

facility is approved. Thus, the long term operational reliability of the proposal (combustion and air quality control equipment) is uncertain.

- **Key issue 3 - Air quality**

  Overall, the plant design has a number of technologies that address 'best practice' when it comes to flue gas cleaning after the heat exchange for the boiler system. This addresses emissions of toxic and acid gases to a Maximum Extent Achievable (MEA) – as required by the NSW EfW Policy.

  The air quality assessment prepared for the EIS has focused on ensuring that the proposal can meet the impact assessment criteria for plant emissions at the upper range of the Best Available Technology (BAT) achievable emission limits (AELs). This is a conservative approach.

  Theoretical emission rates, based on feedstock assumptions and performance of gas cleaning equipment, have been tested through the air dispersion modelling process. Despite significant errors being made in the meteorology input files, the calculated design ground level concentrations (GLC's) are shown to be compliant with the Approved Methods for Modelling and Assessment of Air Pollutants in New South Wales. However they cannot be relied upon.

  Since the Project design and technology selection is preliminary in nature, the Air Quality assessment results can only be viewed as indicative. Ahead of determining if the feedstock management systems will be able to achieve less than 1% of halogenated organic material, the decision not to include a secondary chamber is premature.

- **Key issue 4 - Human health**

  Another significant uncertainty is that heavy Polycyclic Aromatic Hydrocarbons (PAHs) has not been included in the list of chemicals assessed. Heavy PAHs like benzo(a)pyrene are difficult to destroy, and therefore is unlikely to be 100% combusted in the process. As is found with metals, 100% capture in emission control is not possible resulting in low level releases. A technical discussion should be presented as to why PAHs have not been included.

  It should be noted that the results of the health risk assessment are reliant on the results of the air dispersion modelling. Thus any changes resulting from the review of the air quality assessment (which is only currently based on an indicative plant design with no input from specifically nominated technology provider or concept design report by an EfW specialist consultant) will have follow-on impacts on the health risk assessment.

- **Key issue 5 - Noise**

  The assessment predicts minor exceedances to the operational noise criteria, however these exceedances could increase subject to review of the adopted amenity criteria. The assessment discusses the impacts and recommends they are addressed in the detailed design. However, the assessment does not provide information regarding details of all reasonable and feasible mitigation measures with quantification of the expected noise reduction, nor does it provide an

assessment of any residual impacts in accordance with Section 4 of the NSW Noise Policy for Industry (2017).

- **Key issue 6 - Energy from Waste Policy**

  Under the NSW Energy from Waste Policy (EfW Policy) a range of rules are provided on the percentage (%) of residual waste which is eligible for burning and recovering a portion of its embodied energy. The range is from 100% in cases where MSW and C&I waste have specified at source separation of recoverable waste, as this is the most effective way to recover valuable materials from waste. It scales down to 50%, 40% and 25%, 10% and 5% for less source separation and subsequent recovery from mixed and source separated waste. The EfW Policy deliberately and sensibly seeks to ensure that the recovery, reuse and recycling of waste are prioritised over energy from waste and landfilling.

  The proposal does not appear to have access to currently eligible MSW or C&I waste in the quantities sought and speculates on a range of other scenarios so that it can access enough eligible waste to meet the incinerator's capacity. It bases its waste availability assessment on the potential future ability of Cleanaway to win municipal waste contracts and secure C&I waste, which would be highly contested by competitors.

  The modelling of speculative quantities of eligible waste is based on a range of postulations, data sources and includes unpublished data from Cleanaway. This is both subjective and impossible to independently assess. The Waste Study suggests incoming waste could be sourced from the Greater Sydney Region, which stretches as far as from the Shoalhaven City Council to Newcastle City Council areas and appears to be based on the metropolitan levy area. This seems possible, but this adds additional uncertainty about being able to obtain sufficient waste, and for some locations this may be in conflict with the Proximity Principle. The EIS also assesses accessing waste from the Sydney basin, which is the more likely situation.

  The EIS states Mixed Waste Organic Outputs (MWOO) as a possible source of fuel. The proposed Next Gen facility (for which Secretary's Environmental Assessment Requirements (SEARs) have just been obtained) also nominates MWOO as a source of fuel. It is therefore unclear whether the same waste is being counted by both EfW projects.

  One of the reasons for refusal of the original Next Gen facility (of similar capacity to the WSERRC at 552,500 tpa) was that the sources of waste were not well defined, and it appeared that there was insufficient eligible waste of the nominated type to fuel the facility. It is noted that the modified Next Gen facility (for which SEARs have been granted) proposes to have a throughput of only 300,000 tpa, to address one of the reasons for refusal that insufficient eligible waste was available. Thus it may be appropriate for the capacity of this Cleanaway proposal to be reduced from the proposed 500,000 tpa capacity, to address the similar issue with waste sourcing, or potentially delay its commencement or approval until such time as sufficient eligible waste is confirmed to be secured.

The proposal seeks to relax some of the requirements of the NSW EfW Policy with respect to MSW, without the investment in additional resource recovery activities. This could have the effect of resulting in 'mass burn' disposal of MSW, which is contrary to one of the overarching principles in the NSW EfW Policy.

It is also unclear how the sourced C&I waste would be confirmed to meet the eligibility criteria of 100% 'where a business has separate collection systems for all relevant waste streams' as required under the NSW EfW Policy. The EIS suggests that one of the ways this would be independently achieved is it would be approved by the EPA. However, the generators of C&I waste in the main are not required to be licensed by the EPA.

The recovery, reuse and recycling of waste are prioritised under NSW EfW Policy, in recognition that they can achieve superior sustainable outcomes. A significant potential consequence of the WSERRC (if approved) is it could make it more difficult (or delay) future waste recovery, reuse and recycling projects.

Future resource recovery and recycling projects would have to compete in the market with the proposal. This situation would be compounded by the idea mentioned in the EIS to lower the criteria for eligible waste, by not having to recover valuable resources from MSW.

In the late 1990s and early 2000s there was a race to obtain approval for putrescible waste landfills to accept and dispose of Sydney's putrescible waste. The government at the time introduced State Environmental Planning Policy No. 48, which created a requirement that an applicant had to demonstrate 'justifiable demand' for the sought landfill capacity for a proposed putrescible waste landfill to gain development consent.

The NSW Department of Planning, Industry and Environment may see merit in undertaking a similar analysis to assess the potential 'eligible waste' that the WSERRC may potentially access and to assist with the project's determination.

- **Key issue 7 - Ash**

  A concern with the proposal is the waste classification and availability of treatment and disposal facilities for the ash. It is possible that not all of the ash will be able to be reused. For example, the Flue Gas Treatment Residual (FGTr) is expected to be classified as hazardous waste and would need to be treated/immobilised to reclassify it as restricted solid waste in order to enable it to be disposed of in a licensed landfill facility in NSW (as hazardous waste cannot legally be landfilled in any landfills in NSW).

  It is not clear from the information provided in the EIS whether the identified treatment site (or other unidentified sites) can lawfully receive and treat the FGTr ash waste to lower its waste classification to restricted solid waste nor is there a landfill operator willing to accept and dispose of this portion of the ash waste over the duration of the project. These issues should be resolved before the project is determined, to provide confidence that the WSERRC can operate as proposed.

2. Urban design comments

a. Further information is required in relation to the specific issues identified below:

- **Height, bulk and scale of the proposed development within the context of the locality**
    - The materials palette and elevations are to be more prescriptive of the materials, products, profiles and detailing proposed. Generally, what is shown is of a suitably high quality, however there is a vagueness as to what is actually being proposed, as there are numerous different material and detailing images shown on the materials schedule.
- **Visual impact of the proposed building**
    - The landscape strategy is an important factor in mitigating the impact of the building on its immediate context, including adjacent neighbouring lots and importantly the M7 motorway and passing vehicles.
    - The landscape plans demonstrate insufficient perimeter planting to the site. Substantial tree planting should be provided to the full perimeter of the site to provide additional screening to the site, to minimise the visual impact of the external hardstand areas as well as providing important shading to these areas and to a certain extent the building's façade, to mitigate the urban heat island effect.
    - More broadly, the Landscape and Visual Impact Assessment does not fully demonstrate the impact on key sensitive areas by way of photomontages, particularly from high sensitivity areas such as Prospect Reservoir.
- **Details of design measures to ensure the project has a very high design quality and is architecturally designed**
    - Further information regarding finishes and detailing is required to ensure a high-quality finish is achieved.
- **Submission of a landscape strategy detailing screen planting and fencing**
    - The applicant is to incorporate a more organic geometry into the design and layout of the basins. Upon submission, detailed commentary regarding suitability of plant species will be reviewed.

3. Environmental health comments

a. Further information is required in response to the specific issues raised in Schedule 1.

4. Drainage comments

a. The items listed in Schedule 2 (but not limited to) need to be addressed to meet the requirements under Council's DCP, WSUD Developer's Handbook, WSUD standard Drawings and Engineering Guide 2005. These documents can be found at:

https://www.blacktown.nsw.gov.au/files/assets/public/wsud/wsud-developer-handbook-2020/blacktown_council_wsud_developer_handbook_2020.pdf.

b. The applicant is to provide a response to each point raised in Schedule 2 in the form of updated reports and modelling. The required response shall also include:

- Council's engineering requirements as a summary note on the engineering plans i.e. permanent detention required etc
- design summaries where needed.

c. Further, based on the current documents and files, 5% of the proposed overland flow is being directed to the M7's existing swale. A separate approval from Transport for NSW would be necessary.

Schedule 1

1. Technical Report A: Air Quality and Odour Impact Assessment

a. Document: *Air Quality and Odour Impact Assessment, Western Sydney Energy & Resource Recovery Centre (WSERRC),* prepared by Todoroski Air Sciences Pty Ltd, dated 10 September 2020.

- Further clarification is required as to why the Western Sydney Airport, which is 15 km away, was not considered in the air quality assessment. In addition to the Western Sydney Airport, there a number of other industries that need to be considered, the InfraBuild Steel Mill and Austral Bricks for instance. The Austral Bricks site is dismissed despite its major stack source being within a kilometre and some pollutants not accounted for in the background data (hydrogen fluoride for example). The applicant takes the view that the emissions from the proposed incinerator are no worse than the background levels, whereas a best practice approach would be to address the cumulative impact of those industries with a 'licence to pollute' and the need to improve air quality in Western Sydney. The applicant needs to demonstrate that there are no negative cumulative impacts with other industries on the already stressed Western Sydney area, particularly for continuous periods during bushfires.

- *"The analysis has focused on the assessment locations which represent the closest and most likely impacted receptor locations surrounding the proposal and are a mix of residential, commercial and industrial receptors."* (S7.2.1 page 78)

  There is no analysis for the impacted residential receptor locations in Minchinbury and Erskine Park. This analysis should have been undertaken by the proponent as part of the EIS and the EIS is flawed because of this omission. The residents of these locations should have information to understand the impact it will have from their receiver distance.

- *"The flue gas cleaning systems will be operational and are expected to mitigate the release of air pollutant in the flue gas during start up and shut down procedures. Other emissions are expected to be controlled by proper combustion conditions."* (S7.4 page 81)

  The applicant is to explain how this 'expectation' is a realistic mitigation measure. Further clarification is required on the technology chosen for the flue gas cleaning system, and if it will also be available/operational for unexpected shut downs or faults within the process to ensure all emissions are controlled.

- *"Incinerator Bottom Ash (IBA) remaining after the combustion process is discharged into a water bath and quenched … the residual bottom ash is securely stored before transported off-site for recycling or disposal at a licensed facility. Ash residue will be handled in sealed conditions within the facility."* (S8.5 page 89)

The applicant is to clarify the reuse capacity for this type of contaminated waste water within the water bath. Page 65 of the EIS notes that water handled on-site, including process water from the EfW process, will be reused on-site.

- *"Ambient air quality monitoring near the proposal was commissioned for a three-month campaign from 23 October 2019 to 23 January 2020."* (page 30)

  The applicant is to explain why this date range was used for the campaign, when bushfires would attribute to elevated particle levels.

2. Technical Report B: Human Health Risk Assessment

a. Document: *Cleanaway Western Sydney Energy and Resource Recovery Centre: Health Risk Assessment,* prepared by Environmental Risk Sciences, dated 10 September 2020.

- The applicant is to describe the ambient air quality monitoring undertaken specifically for the project.
- *"Two monitors were installed to monitor local air quality for 3 months from October 2019 to January 2020."* (page 27 S4.5)

  According to the report, both locations were considered relevant for assessing current local air quality in residential areas that could be most affected by the proposed facility.

  The applicant is to explain why the Human Health Risk Assessment did not consider a sample period when there is no bushfire smoke impact to determine true background local air quality.

  There is no discussion towards the air quality impact on nearby residential receivers at Minchinbury and Erskine Park. The applicant is requested to explain why background local air quality was not a requirement for the campaign study in determining the human health impacts from the proposal.
- Assuming that stack concentrations will be similar to those measured at a facility that uses similar waste types for fuel and which has similar pollution control technology (S4.6.4 page 32), how can the applicant confirm this if a pollution control technology has not been identified.
- Page B-4 *Appendix B Methodology and assumptions for Other Pollutants* provides Table B3: Inhalation exposure assumptions.

  The applicant is to explain if the exposure time for industrial workers 8 hours/day, exposed at the maximum location all day every day of the year has also accounted for the employees of the facility working within the bunker/maintenance, not just neighbouring industrial businesses.

3. **Technical Report G: Detailed Site investigation**

   a. Document: *Report on Detailed Site (Contamination) Investigation, prepared by Douglas Partners Pty Ltd,* dated 14 August 2020.

      - *"A number of minor detections were recorded in the laboratory analysis of the gas sampling at the site during the two monitoring rounds. Based upon the inferred groundwater flow direction to the north east the source of the detection would more likely be attributable to the landfill facilities further to the south. Continued vapour sampling and testing is recommended to further assess trends in these results."* (S11.1.3 page 44)

        The applicant is to clarify if the proposed 15 m deep bunker will affect existing shallow groundwater conditions.

      - It is understood that "*the bunker will be impermeable"* (page xxvii EIS). The applicant is to explain how will this continue to be assessed to ensure leachate does not impact groundwater.

4. **Technical Report G2: Remediation Action Plan**

   a. Document: *Remediation Action Plan, prepared by Douglas Partners Pty Ltd,* dated 14 August 2020.

      - The applicant is to engage a NSW Environment Protection Authority accredited Site Auditor to review the remediation suggested, validation report and prepare and submit a Site Audit Statement.

        The Site Audit Statement shall verify that the investigation, remediation and validation was carried out in accordance with the required guidelines and that the site is suitable for the proposed use.

5. **Technical Report I: Noise and Vibration Impact Assessment**

   a. Document: *Noise and Vibration Impact Assessment, prepared by Arup Pty Ltd,* dated 24 August 2020.

      - The applicant is to develop a Noise Management Plan for the proposed operation of the site, not just for during construction phase.

6. **Technical Report N: Greenhouse Gas and Energy Efficiency Assessment Report**

   a. Document: *Greenhouse Gas (GHG) and Energy Efficiency Assessment Report, prepared by Arup Pty Ltd,* dated 24 August 2020.

      - It is stated that "*the current EIS has been prepared in general accordance with 'AGO Factors and Methods Workbook, Australian Greenhouse Office (AGO) (August 2004)'".* This reference is outdated. This is referring to a very old version of the AGO Factors and Methods workbook, in which electricity grid GHG emission factors may differ substantially from current factors. It is also not clear which information/factors/methods from this document are used in the EIS, or where they are used.

The applicant is to clarify what information from the 2004 publication is relevant, and ensure that the emission factors and methods used in the analysis are current.

- In Section 3.4, table 2: Operational front-end loader (FEL) diesel use for 'On-site fuel combustion – stationary' appears to be significantly overestimated and the data is in unusual volume units (m^3). Inclusion of this diesel use (2.5 million litres) may be erroneous, since diesel use for FEL is also (correctly) listed under 'On-site fuel combustion – mobile'.

  Diesel use by 'stationary' FEL is 12.5 times higher than for 'mobile' FEL. Consumption of 2.5 million litres of diesel is equivalent to 48 FELs operating continuously for a year. This materially impacts calculation of gross operational GHG emissions.

  The applicant is to validate the FEL diesel data for 'On-site fuel combustion – stationary' and justify inclusion in the 'stationary' emission category is required.

- In Section 3.4, table 2: The 'On-site fuel combustion – stationary' category states that diesel consumed during start-up/shutdown (based on 5 per year at 7 hour duration on average) = 40 m^3/year.

  This implies a total of 40 m^3 diesel per year across 5 start-up/shutdown events. However, in Table A2 (Appendix A) this figure is multiplied by the number of events, giving a total of 200 m^3/year for this activity.

  The applicant is to ensure the correct multiplication factor is applied to the diesel volume calculation, i.e. whether the total volume of diesel used is per event or for all 5 events.

- In Section 3.4, table 2: Incorrect unit used in calculation of parasitic electricity consumed from grid when plant is offline.

  The calculation is based on "…2 weeks of shutdown 24 hours/day at value of 1MW/h". The unit MW/h is incorrect. Assuming the continuous load is 1MW, it should state clearly that 1MW x 24 hour x 2 weeks = 336MWh.

  The applicant is to confirm parasitic electricity consumed from grid when plant is offline = 336MWh/year.

- On Page 18, footnote 13: Projection of grid electricity emission factors beyond 2030 has been interpolated based on historic data and past decline. A footnote states that these interpolations are provided in Appendix A, however they have not been included there.

  Development of renewable energy generation capacity in Australia continues to increase year on year at a record rate. The Australian Energy Market Operator (AEMO) states in its Integrated System Plan that 63% of Australia's coal-fired generation is set to retire by 2040. Using a linear interpolation may materially impact the project's longer-term GHG emission calculations.

The applicant is to review the assumption of a linear decline of electricity grid emission factors through to 2050 and to consider using a more appropriate projection beyond 2030.

- In Appendix A, tables A5 and A6: The tables showing 'EF Calculations - export of electricity' and 'EF Calculations - import of electricity' are confusing, as are the accompanying explanatory footnotes.

  The emission factor used for 2024 impacts the calculation of avoided GHG emissions from grid export and GHG emissions for grid import. Table footnotes state *"These estimates have been multiplied by a factor of 6 - based on working backwards from a 2050 scenario where the grid has been decarbonised. However, it is assumed grid would not be fully decarbonised, therefore factor of 6 is assumed, which sees decarbonisation of grid - but unlikely - interpreted as a linear decline".*

  The applicant is to clarify calculation of avoided GHG emissions from grid export and GHG emissions for grid import in plant start-up year 2024.

Schedule 2

1. Drainage

a. Provide a survey of the site for review.
b. Provide a detention basin catchment plan to match the spreadsheet provided. Include any bypass including the 5% draining to the M7 motorway.
c. Justify that the post-development flows to the M7 motorway swale do not exceed the pre-development flows. Provide pre to post catchment areas as well as flows. This may require concurrence from Transport for NSW.
d. Provide a water quality catchment plan to match the MUSIC model including areas and naming. Include any bypass such as batter works etc.
e. Provide a DRAINS model for the internal drainage system. Model the 1 year, 20 year and the 100 year storms. Consider all tailwater conditions and flood levels.
f. Provide a line legend for all lines used, including the blue arrow lines angled (assuming subsoil drainage) as shown on Dwg. 0601 (0) connecting to pit 001A-8 and others.
g. Provide a cover sheet for all the engineering plans.
h. The northern section lot (2.04 ha) as stated in the Hydrology and Flooding assessment report is to show all the mentioned works and provide notes on plan such as clearing of weeds, continuation of the channel all the way within the site and how it ties into the existing levels.
i. Show all the channel works including within the 2.04 ha area within the lot to the north separated by the right of carriageway. Also show the channel works within the right of carriageway.
j. Provide levels along the channel at regular intervals at the invert of the channel and top of channel.
k. Provide a stormwater tank harvesting the treated subsoil flows from the bioretention basin in addition to a rainwater tank. The harvested stormwater and rainwater are to be ‘fit for purpose’. State that on the plans. The stormwater tank is to be modelled in MUSIC with the ‘pipe flow’ as a secondary link to a stormwater tank from the bioretention.
l. Provide rainwater + stormwater tank MUSIC model. It is evident that the 2 tanks will not be able to achieve the required 80% reuse demand using non-potable water based on the water balance table provided. Thus, provide a reuse graph for determination. Plot reuse demand met versus tank size.
m. Provide the Energy from Waste building finished floor level and note how the flood planning level is achieved.
n. Headwall 003A-2 impedes the flows within the channel. Relocate the headwall within the channel batter works, otherwise provide an alternative discharge point.
o. Provide a long section of drainage pipe 003A. This has not been provided.
p. Provide a minimum 4 m wide maintenance access track as per the WSUD standard drawings for all GPTs, bioretentions, detention basins and channel. Where the widths are beyond 9 m with batter works, then a maintenance access track to the base of the basins is required. Provide turning paths for a 9 m service vehicle.

q. Show the subsoil drainage for the bioretention connecting to the downstream headwall. The subsoil drainage within the bioretention is to collect into a sealed pit within the bioretention before discharging directly to the headwall.
r. Refer to Council's WSUD standard drawings for large basin designs.
s. Provide the basin dimensions for assessment.
t. Show all batter works/lines clearly on all basin batters. Currently there are empty batters.
u. Show rock armour for scour protection on all spillways including the bioretention spillway to detention basin.
v. The detention basin deemed to comply spreadsheet requires 2 x discharge control pits, one for the 1.5 year orifice and another for the 100 year orifice.
w. It is not clear whether there are 2 channels proposed or just many batters proposed in one location. Provide 4 section drawings of the channel as follows
    - section drawing showing the visitor centre, basins and channel to the north
    - section drawing showing the carpark, 525 dia. pipe part of the basin and full width of the channel
    - section drawing of the carpark, 450 dia. pipe, steep contours and the full width of the channel
    - section drawing of the substation, steep contours and full width of the channel to the south.
x. Provide the 100 year flood level within the channel for comparison to the internal stormwater system for all channel sections.
y. Ensure that the overland flows from the upstream external catchments are fully contained within the site.
z. Provide 1:200 drawings that are legible at A3 paper size.
aa. Ensure batter works are not steeper than 1:3 unless suitable soil stabilisation methods are used, noted and shown on plans.
bb. Provide the design HGL of all pipe long sections and specify the design storm i.e. 20 year HGL.
cc. Elaborate on the works to occur on the 2.04 ha as stated in the Hydrology and Flooding Assessment Report. All works are to be shown on plan including channel works.
dd. Flood modelling is to consider the pre-development dam as full and provide the flood model.
ee. Delete the detention basin node from the MUSIC model.
ff. Stream Erosion Index is not required for the development as a permanent detention basin is proposed.

2. MUSIC modelling

a. No exfiltration is permitted for channels or bioretention.
b. No treatment is to be modelled for any channels.
c. Ensure the bioretention basin is lined and the underdrain is present.
d. High flows are to be 100.00, left untouched. Provide an upstream GPT or splitter pit to direct the 6 month flows to the bioretention.
e. The bioretention unlined filter media permitter is to be 0.1.

f. Provide the proposed GPT treatment flow table and catchment areas. Provide levels. Outlets from the GPT to be at minimum with the bioretention Extended Detention Depth (EDD). The bioretention EDD is to be with the 1.5 year basin TWL.
g. The GPT is to treat the 6 month flows while redirecting the 6 month flows to the bioretention. Flows beyond the 6 month storm are to be directed to the detention basin. Provide all the 6 month calculations/model.
h. All roads are to be modelled as 95% imperviousness.
i. Revise the MUSIC model based on this report.

3. Channel Dwg. 0691 (0)

a. The external catchment of 1.2 km^2 as stated in the hydrology report produces over 40 m^3/s in flows entering the site. Provide the lidar/survey contours and the catchment boundaries clearly with the engineering plans for assessment.
b. Provide the corresponding flows from the catchment considering a fully developed upstream catchment.
c. Provide an inflow hydrograph graph at the start of the channel within the flood report.
d. Provide a sufficiently sized channel to cater for upstream flows, as currently it is undersized.
e. The 'typical channel' drawings do not reflect the drawings and will need to be more detailed.
f. Provide riffle and ponds along the channel generally in accordance with Melbourne Water Guidelines.
g. Use a manning's value of 0.085 for the entire channel.
h. The longitudinal slope of the channel is to be within 0.5% to 1%.
i. The maximum velocity within the channel is not to be beyond 2 m/s.
j. Provide the capacity design and design calculations/models with an adequate 0.5 m freeboard to the embankment.
k. Channel batter slopes are to be 1:4.
l. Provide the length of the channel along the entire length within the site including the northern section. Provide the minimum and maximum levels for slope calculations. Based on Council's data, the invert level of the channel towards the south is 54.5 m and 51.5 m towards the northern end with an approximate length of 380 m throughout the site.

4. Basins Dwg. 0692 (0)

a. The provided section has no reference to the plans although it states section 7 dwg. 0301. This seems to be an error.
b. The bioretention and detention basin is to be as per the WSUD standard drawings. The bioretention is to be modelled with a maximum 400 mm EDD rather than the current 500 mm EDD.
c. Show all the gradients as per the plans.
d. Show all overflow weir lengths and levels. This is to be reflected in the MUSIC model.
e. The 'top of basin wall level 56.0' is to be 2 m wide at minimum.

f. The top of basin wall level is to be 500 mm above the 1% AEP storage level and 300 mm to the spillway weir.
g. The bioretention spillway is to be a minimum of 1 m with scour protection.
h. Provide the 2 discharge control pits as per the provided deemed to comply spreadsheet.
i. Provide all levels and lengths that are provided within the OSD spreadsheet.
j. Provide details of the basin discharge control pits. Show both discharge control pits including levels and orifices.
k. Show how the 'RL of obvert of pit outlet pipe' of 53.45 on the spreadsheet was determined. This level is to be the obvert of the 900 mm OSD outlet at the discharge point into the channel.
l. Redesign the detention basin emergency overflow to face the channel rather than the right of carriageway.

END

Blacktown City Council

Western Sydney Energy and Resource Recovery Centre
Review of Environmental Impact Statement

November 2020

Executive summary

GHD was engaged by Blacktown City Council (Council) to provide a review of the EIS (Environmental Impact Statement) and specialist reports for the Cleanaway Western Sydney Energy and Resource Recovery Centre (the WSERRC). The key findings of this review and recommendations are summarised below.

Key issue 1 - Planning

The site is located within the Western Sydney Parklands (WSP). *State Environmental Planning Policy (Western Sydney Parklands) 2009 (SEPP WSP)* is the principal environmental planning instrument controlling development and land use planning in the WSP. The site is unzoned and the proposed development is permitted with consent.

The EIS has not adequately addressed the provisions of the WSP to enable clear demonstration of the beneficial social and economic outcomes to Western Sydney of the proposed development in this location. Having regard to the above, this also raises questions on the suitability of the site and whether the proposed development in the proposed location, within the WSP is in the public interest.

Key issue 2 - Technology and design

Whilst the type of technology to be used is broadly nominated, and architectural plans of the buildings and layout plans have been provided, there is a possibility that the plant layouts may need to be modified once a technology provider is nominated and actually designs the facility. Normally the technology provider would be involved in preparing the plant design for the EIS. It is not clear who prepared this design, and their level of experience in designing such facilities.

A concept design report and drawings should have been prepared for the EIS by the nominated technology provider. An architectural design report has been prepared, and some civil design drawings are provided, but there is no concept design report about the technology itself, which is the most critical aspect of an energy from waste facility.

The lack of a concept design report from an energy from waste specialist consultant and of technical input from a nominated technology provider and means that the justification of the technology, and the details provided about how the plant would operate, are only very high level.

Determination of this proposal could possibly need to be deferred until such information is available, and air quality and health risk assessments can be confirmed as being in alignment with the adopted equipment from the nominated technology provider.

The NSW EfW Policy calls for a secondary combustion chamber to be provided where “the temperature should be raised to 1100°C for at least 2 seconds after the last injection of air”, if chlorine levels are expected to be above 1%. The EIS states that as the average chlorine content for the intended feedstock mix remains less than 1%, the design temperature of 850 degrees Celsius is appropriate.

The results of waste audits and laboratory testing of MSW and C&I waste received at the Erskine Park transfer station in 2019 are used to suggest that chlorine levels in the feedstock will not exceed 1% in any case. As no sampling and analysis methodology and information was provided in Technical Report C and Technical Report E, it is impossible to assess how representative is the data.

Given the intent to obtain sufficient waste to run the facility through winning future Council (MSW) contracts sources of waste, and how close the chlorine levels (0.94 %) in MSW are close to 1%, it would seem prudent to make provision for a secondary combustion chamber in the design, in case it is required. There is no provision made in the plant design.

The EIS also states that some of the waste streams will be subject to sorting and active removal of PVC, although the extent to which this would be undertaken (some or all waste streams) is not clear. It is stated that this would involve building new facilities at either the Erskine Park transfer station (and extending it), or elsewhere. No firm commitments are made, and the feasibility of extending the existing transfer station is not discussed, but it is noted in the EIS that this would require separate approvals.

Key issue 3 - Reference plants

Despite dozens of EfW facilities operating around the world, only two reference facilities have been nominated (Dublin, Ireland and Filborna, Sweden). However, Table 5.7 of the EIS only compares the waste types with the Dublin plant, not the Filborna plant. Whilst the waste types are broadly the same, no detailed comparison of waste composition (by %) between the Proposal is provided. Also there is not enough information provided about the Dublin plant to be able to verify whether the waste types are actually the same.

The two nominated reference plants have different technology providers. The Dublin plant uses Hitachi Zosen Inova technology, whilst the Filborna plant uses Babcock Wilcox technology. No assurances are provided in the EIS that these technology providers or equivalently experienced providers would be used. Hence, other less reliable or proven technology providers could be utilised instead, if the facility is approved. Thus, the long term operational reliability of the proposal (combustion and air quality control equipment) is uncertain.

Key issue 3 - Air quality

Overall, the plant design has a number of technologies that address ‘best practice’ when it comes to flue gas cleaning after the heat exchange for the boiler system. This addresses emissions of toxic and acid gases to a Maximum Extent Achievable (MEA) – as required by the NSW EfW Policy.

The air quality assessment prepared for the EIS has focused on ensuring that the proposal can meet the impact assessment criteria for plant emissions at the upper range of the Best Available Technology (BAT) achievable emission limits (AELs). This is a conservative approach.

Theoretical emission rates, based on feedstock assumptions and performance of gas cleaning equipment, have been tested through the air dispersion modelling process. Despite significant errors being made for the meteorology input files, the calculated design ground level concentration (GLC’s) are shown to be compliant with the *Approved Methods for Modelling and Assessment of Air Pollutants in New South Wales*. However they cannot be relied upon.

Since the Project design and technology selection is preliminary in nature, the Air Quality assessment results can only be viewed as indicative. Ahead of determining if the feedstock management systems will be able to achieve less than 1 % of halogenated organic material, the decision not to include a secondary chamber is premature.

Key issue 4 - Human health

The one main uncertainty is that heavy Polycyclic Aromatic Hydrocarbons (PAHs) has not been included in the list of chemicals assessed. Heavy PAHs like benzo(a)pyrene are difficult to destroy, and therefore is unlikely to be 100% combusted in the process. As is found with metals, 100% capture in emission control is not possible resulting in low level releases. A technical discussion should be presented why PAHs have not been included.

It should be noted that the results of the health risk assessment are reliant on the results of the air dispersion modelling. Thus any changes resulting from the review of the air quality assessment (which is only currently based on an indicative plant design with no input from specifically nominated technology provider or concept design report by an EfW specialist consultant) will have follow on impacts on the health risk assessment.

Key issue 5 - Noise

The assessment predicts minor exceedances to the operational noise criteria, however these exceedances could increase subject to review of the adopted amenity criteria. The assessment discusses the impacts and recommends they are addressed in detailed design. However the assessment does not provide information regarding details of all reasonable and feasible mitigation measures with quantification of the expected noise reduction, nor does it provide an assessment of any residual impacts in accordance with Section 4 of the *NSW Noise Policy for Industry* (2017).

Key issue 6 - Energy from Waste Policy/Waste

Under the NSW Energy from Waste Policy (EfW Policy) a range of rules are provided on the percentage (%) of residual waste which is eligible for burning and recovering a portion of its embodied energy. The range is from 100% in cases where MSW and C&I waste have specified at source separation of recoverable waste as this is the most effective way to recover valuable materials from waste. It scales down to 50%, 40% and 25%, 10% and 5% for less source separation and subsequent recovery from mixed and source separated waste. The EfW Policy deliberately and sensibly seeks to ensure that the recovery, reuse and recycling of waste are prioritised over energy from waste and landfilling.

The proposal does not appear to have access to currently eligible MSW or C&I waste in the quantities sought and speculates on a range of other scenarios so that it can access enough eligible waste to meet the incinerator's capacity. It bases its waste availability assessment on the potential future ability of Cleanaway to win municipal waste contracts and secure C&I waste, which would be highly contested by other competitors.

The modelling of speculative quantities of eligible waste is based on a range of postulations, data sources and includes unpublished data from Cleanaway. This is both subjective and impossible to independently assess. The waste study suggests incoming waste could be sourced from the Greater Sydney Region, which stretches as far as Shoalhaven City Council to Newcastle City Council areas and appears to be based on the metropolitan levy area. This seems possible, but this adds additional uncertainty about being able to obtain sufficient waste and for some locations may be in conflict with the Proximity Principle. The EIS also assesses accessing waste from the Sydney basin, which is the more likely situation.

The EIS states Mixed Waste Organic Outputs (MWOO) as a possible source of fuel. The proposed Next Gen facility (for which Secretary's Environmental Assessment Requirements (SEARs) have just been obtained), also nominates MWOO as a source of fuel. It is therefore unclear whether the same waste is being counted by both EfW projects.

One of the reasons for refusal of the Next Gen facility approval (of similar capacity to the WSERRC at 552,500 tpa) was that the sources of waste were not well defined, and it appeared that there was insufficient eligible waste of the nominated type to fuel the facility. It is noted that the modified Next Gen facility (for which SEARs have been granted) proposes to have a throughput of only 300,000 tpa, to address one of the reasons for refusal, that insufficient eligible waste was available. Thus it may be appropriate for the capacity of the proposal to be reduced from the proposed 500,000 tpa capacity, to address the similar issue with waste

sourcing or potentially delay its commencement until such time as sufficient eligible waste is confirmed to be secured.

The proposal seeks to relax some of the requirements of the NSW EfW Policy with respect to MSW, without the investment in additional resource recovery activities. This could have the effect of resulting in 'mass burn' disposal of MSW which is contrary to one of the overarching principles in the NSW EfW Policy.

It is also unclear how the sought C&I waste would be confirmed to meet the eligibility criteria of 100% 'where a business has separate collection systems for all relevant waste streams' as required under the NSW EfW Policy. The EIS suggests that one of the ways this would be independently achieved is it would be approved by the EPA. However, the generators of C&I waste in the main are not required to be licensed by the EPA.

The recovery, reuse and recycling of waste are prioritised under NSW EfW Policy, in recognition that they can achieve superior sustainable outcomes. A significant potential consequence of the WSERRC (if approved) is it could make it more difficult (or delay) future waste recovery, reuse and recycling projects.

Future resource recovery and recycling projects would have to compete in the market with the proposal. This situation would be compounded by the idea mentioned in the EIS to lower the criteria for eligible waste, by not having to recover valuable resources from MSW.

In the late 1990s and early 2000s there was a race to obtain approval for putrescible waste landfills to accept and dispose of Sydney's putrescible waste. The government at the time introduced State Environment Planning Policy No. 48, which created a requirement that an applicant had to demonstrate 'justifiable demand' for the sought landfill capacity for a proposed putrescible waste landfill to gain development consent.

The NSW Department of Industry, Planning and Environment may see merit in undertaking a similar analysis to assess the potential 'eligible waste' that the WSERRC may potentially access and to assist with the project's determination.

Key issue 7 - Ash

A concern with the proposal is the waste classification and availability of treatment and disposal facilities for the ash. It is possible that not all of the ash will be able to be reused. For example the Flue Gas Treatment Residual (FGTr) is expected to be classified as hazardous waste and would need to be treated/immobilised to reclassify it as restricted solid waste to enable it to be disposed of in a licensed landfill facility in NSW (as hazardous waste cannot legally be landfilled in any landfills in NSW).

It is not clear from the information provided in the EIS whether the identified treatment site (or other unidentified sites) can lawfully receive and treat the FGTr ash waste to lower its waste classification to restricted solid waste nor is there a landfill operator willing to accept and dispose of this portion of the ash waste over the duration of the project. These issues should be resolved before the project is determined to provide confidence that the WSERRC can operate as proposed.

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Appendices

1. Introduction

1.1 Overview

Cleanaway and Macquarie Capital are seeking a State Significant Development consent for the construction and operation of the Western Sydney Energy and Resource Recovery Centre (the WSERRC proposal). An environmental impact statement (EIS) has been prepared that provides the basis for the proposal and assesses potential environmental impacts of the proposal.

GHD has been engaged by Blacktown City Council (Council) to provide a review of the EIS and specialist reports. An initial review of the overall EIS identified that the key issues for the proposed development were air quality, human health impact, noise, waste processes and technology and planning requirements. The key findings and recommendations are summarised in this report.

1.2 Purpose of this report

The purpose of this report is to provide a detailed review of the EIS and specialist reports for the WSERRC project to support Council's submission to the Department of Planning, Industry and Environment (DPIE).

1.3 Scope and limitations

This report: has been prepared by GHD for Blacktown City Council and may only be used and relied on by Blacktown City Council for the purpose agreed between GHD and the Blacktown City Council as set out in section 1.2 of this report.

GHD otherwise disclaims responsibility to any person other than Blacktown City Council arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (refer section(s)4 to 11 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Blacktown City Council and others who provided information to GHD (including Government authorities)], which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

The planning review has been limited to the permissibility of the development and alignment with relevant objectives of the State Environmental Planning Policy (Western Sydney Parklands) 2009 (SEPP WSP). A review of the EIS under the provisions of State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011, State Environmental Planning Policy No. 33 - Hazardous and Offensive Development and SEPP (Western Sydney Aerotropolis) 2020 has not been carried out.

2. Description of the proposal

The proposal is 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. Residual waste is waste that is left over from recycling and resource recovery operations and waste from source separated collections. The proposal also includes a visitor and education centre and onsite ancillary infrastructure and services

The facility would generate up to 58 megawatts (MW) of base load electricity per year.

The facility also includes a ferrous metal 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 FGTr and boiler fly ash, will be managed offsite using existing infrastructure.

The EIS notes that whilst some residual materials are produced because of the EfW process, including IBA (65,800 tpa dry weight, becoming 80,000 tpa wet weight after quenching), FGTr (20,000 tpa) 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.

3. Framework for review

3.1 SEARs

The SEARs requirements are relevant to the review. Appendix A of the EIS provides a copy of the SEARs, and cross references to where they have been addressed in the EIS. Where relevant, the SEARs are referred to in the discussions of each topic in this report. In most cases, it can be argued that the SEARs have been addressed, however it is a matter of how adequately they have been addressed in some areas.

3.2 Methodology and appropriateness of assessments

This review focusses on a few key areas - air quality, human health impact, noise, waste processes and technology and planning requirements. These are areas where GHD staff have specialist experience, and are able to determine whether the methodologies used for assessment are appropriate, whether assumptions made are suitable and realistic, and whether the conclusions made are sound, and based on the information presented in the EIS and supporting studies.

3.3 Comparison with Next Gen project

In some areas, such as technology selection, waste sourcing and composition, it is useful to draw comparisons with corresponding aspects of the Next Gen project that was unsuccessful in gaining planning approval.

A table has been prepared by GHD to provide a direct comparison between the features of the proposal and the same features of the Next Gen facility that was refused planning approval. This is provided in Appendix A.

In addition, a table is also provided in Appendix B that compares emissions from the proposal with the emissions from Next Gen project (Initial EIS, Amended EIS and Response to Submissions report), the two nominated Reference Plants, the NSW POEO Clean Air Regulation Schedule 3 (Group 6) and the Industrial Emissions Directive (IED) (2010/75/EU).

4. Planning

4.1 Overview

The scope of the planning review has been limited to reporting on items that cannot be addressed as conditions of consent or managed through the creation and implementation of management plans post any approval.

4.1.1 Site and Locality

The Environmental Impact Statement (EIS) states that the site of the EfW facility covers an area of approximately 8.23 ha hectares and is within the Wallgrove Precinct of the Western Sydney Parklands (WSP) Plan of Management

Located to the immediate north is the SUEZ Eastern Creek Waste Management Centre. Global Renewable's waste management facility is located to the immediate east.

The site is bounded by the WestLink M7 Motorway to the west with the Eastern Creek industrial areas located further west. The Warragamba Prospect Pipeline and Austral Brick are located to the immediate south.

The nearest residential area is located approximately 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 approximately 2km to the south of the site and a childcare centre is located approximately 800 m to the west of the site in the Eastern Creek industrial area.

4.1.2 Summary of Development Application

The development application before the Department of Planning Industry and Environment (DPIE) for determination proposes the construction and operation of an EfW facility that would:

- Use moving grate incinerator technology 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.
- Include a ferrous metal 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 EIS states that options to reuse the IBA in construction products are being explored. 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 FGTr and boiler fly ash, will be managed offsite using existing infrastructure.
- Generate up to 58 megawatts (MW) of base load electricity per year.
- Include a visitor and education centre and onsite ancillary infrastructure and services
- Operate 24 hours a day, seven days a week
- Receive waste feedstock from a pre-processing facility such as the Cleanaway Erskine Park Waste Transfer Station or direct deliveries from kerbside collections, transported to the site by heavy vehicles.

The EIS identifies residual waste as waste that is left over from recycling and resource recovery operations and waste from source separated collections.

4.1.3 Need for the Project

The EIS states that energy recovery of waste is preferable to landfill, and that as NSW transitions towards circular economy principles, EfW facilities will play an important role in diverting waste from landfill. Further, the EIS states that 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.

Section 9 of this report address the project's alignment with the NSW EPA's Energy from Waste Policy Statement – in particular whether the development is likely to use material for energy recovery instead of utilising the material to achieve higher order resource recovery outcomes.

4.1.4 Environmental Planning Instruments

The EIS provides consideration and assessment of the Environmental Planning Instruments (EPIs) that apply to the project. These EPIs are:

- State Environmental Planning Policy (Infrastructure) 2007 (ISEPP)
- State Environmental Planning Policy (State and Regional Development) 2011 (SEPP SRD)
- State Environmental Planning Policy (Western Sydney Parklands) 2009 (WSP SEPP)
- State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011
- State Environmental Planning Policy No. 33 - Hazardous and Offensive Development
- State Environmental Planning Policy No. 55 – Remediation of Land
- State Environmental Planning Policy (Vegetation in non-rural areas) 2017.

Whilst State Environmental Planning Policy No. 64 Advertising and Signage EPP No 64 – Advertising and Signage does not apply to land to which State Environmental Planning Policy (Western Sydney Parklands) 2009 applies it has been considered as a guideline for business identifications signage.

The EIS (dated 23 September 2020) also considers the Western Sydney Aerotropolis Discussion Paper on the Proposed State Environmental Planning Policy with regard to potential impacts on protected airspace. It should be noted that the *SEPP (Western Sydney Aerotropolis) 2020* was gazetted on 1 October 2020 and is a relevant consideration in the assessment of this application.

4.1.5 Project Permissibility

The WSP SEPP is the principal EPI controlling development and land use planning in the WSP. All land in the Parklands is unzoned. All forms of development other than residential or exempt development are permitted with consent.

Project Permissibility - The site is located within the WSP. The *SEPP WSP* is the principal environmental planning instrument controlling development and land use planning in the WSP. The site is unzoned and the proposed development is permitted with consent.

Statutory and Strategic Context – The SEARs issued for the project requires demonstration that the proposal is generally consistent with all relevant planning strategies environmental planning instruments, district plans and justification for any inconsistencies.

There is general consistency with the directions and objectives of the Greater Sydney Region Plan.

Site suitability – The EIS nominates that the main factors in determining the final site location include:

- Maximising the separation distances to residential areas
- Zoning of the site
- Access to transport networks
- Proximity to the source of the waste
- Access to a grid and other utility connections
- Site size and configuration
- Avoidance of protected airspace
- Compatibility with surrounding land uses.

Whilst the above factors are relevant in determining a suitable site location for an EfW facility, the EIS has not adequately addressed the suitability of the site in relation to its location with the WSP. In particular, the provisions of Clause 2 of the SEPP WSP which require clear demonstration of the beneficial social and economic outcomes to Western Sydney of a proposed development being located within the WSP.

Whilst it is noted that the EIS states that around 900 direct construction jobs will be created over the 3-year construction period, as well as 50 highly skilled jobs during operation, supporting employment opportunities in the Western Sydney region, beneficial social outcomes have not been adequately addressed. Impacts on air quality, noise and human health are discussed in Sections 6, 9 and 10 respectively.

Furthermore, in determining a development application a proposal on land in the WSP, the consent authority must consider under Clause 12 of the SEPP WSP the following matters:

(a) the aim of this Policy, as set out in clause 2 (refer above)

(g) the impact on the physical and visual continuity of the Western Parklands as a scenic break in the urban fabric of western Sydney,

(j) the impact on surrounding residential amenity,

The Public Interest

The NSW EfW Policy requires that an applicant undertakes genuine dialogue with the community and to ensure that planning consent and other approval authorities are provided with accurate and reliable information. Whilst the development has been informed by a comprehensive approach to community and stakeholder engagement, it is not clear if the applicant has been able to gain the community and key stakeholders acceptance of the proposal.

The EIS has not identified a suitable reference facility and therefore the expected air emissions from the facility are unknown.

There are questions around whether the proposal is consistent with the NSW EfW Policy (refer Section 8)

Given the uncertainties described above, the location of the proposal within 1-3 km of a number of residential areas, employment areas, childcare and schools, is not suitable

Having regard to the above and the matters raised under site suitability, the EIS has not adequately demonstrated that the proposed development in the proposed location, within the WSP, is in the public interest.

4.2 Key findings

Table 4-1 summarises the key issues.

Table 4-1 Planning review

EIS Reference	Key findings/Issues	Actions and recommendations
Clause 6 of Schedule 2 of the EP&A Regulation	Clause 6 Form of an Environmental Impact Statement An environmental impact statement must contain the following information— the name address and professional qualifications of the person by whom the statement is prepared the name and address of the responsible person 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, a description of the development, activity or infrastructure to which the statement relates, 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, 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.	Name and professional qualifications provided. Address not provided – minor non-conformance Addressed Addressed Addressed Partially addressed, refer Clause 7 below . Addressed Not addressed. Refer Section 5. The two nominated reference plants in the EIS have different technology providers. The Dublin plant uses Hitachi Zosen Inova technology, whilst the Filborna plant uses Babcock Wilcox technology. No assurances are provided in the EIS that these technology providers or equivalently experienced providers will be used. Hence, other less reliable or proven technology providers could be utilised instead, if the facility is approved. Thus as stated in Section 5, the long term operational reliability of the proposal (combustion and air quality control equipment) is uncertain. Addressed
Clause 7 of Schedule 2 of the EP&A Regulation	An environmental impact statement must also include each of the following— a summary of the environmental impact statement,	Addressed – Executive Summary Addressed – Section 1.2 of Chapter 1 Addressed – Section 2.6 of Chapter 2

EIS Reference	Key findings/Issues	Actions and recommendations
	a statement of the objectives of the development, activity or infrastructure, 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, an analysis of the development, activity or infrastructure, including— (i) a full description of the development, activity or infrastructure, and (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 (iii) the likely impact on the environment of the development, activity or infrastructure, and (iv) a full description of the measures proposed to mitigate any adverse effects of the development, activity or infrastructure on the environment, and (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, a compilation (in a single section of the environmental impact statement) of the measures referred to in item (d)(iv), 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).	. Addressed – Chapter 3 Partially addressed in Chapter 7 in relation to a general description of the environment likely to be affected but no section detailing those aspects of the environment that are likely to be significantly affected / or a statement indicating that there are no such area. Addressed – Chapters 8 – 23 Addressed – Chapters 8 – 23 Addressed – Chapter 4 Addressed – Section 24 Addressed – Section 25.5 however, as stated above, no assurances are provided in the EIS that the reference facility technology providers or equivalently experienced providers will be used.
Consideration of all relevant	The EIS provides consideration and assessment of the EPIs that apply to the project. These EPIs are:	The EIS has not adequately addressed a number of relevant provisions of the SEPP WSP.

EIS Reference	Key findings/Issues	Actions and recommendations
environmental planning instruments	State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) State Environmental Planning Policy (State and Regional Development) 2011 (SEPP SRD) State Environmental Planning Policy (Western Sydney Parklands) 2009 (WSP SEPP) State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011 State Environmental Planning Policy No. 33 - Hazardous and Offensive Development State Environmental Planning Policy No. 55 – Remediation of Land State Environmental Planning Policy (Vegetation in non-rural areas) 2017. Under Part 4, division 1, clause 22 of the Western Sydney Parklands Act (WSP Act) 2006, 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. Notwithstanding the above, the key provisions of SEPP WSP relevant to the proposal being Clause 2 and Clause 12 have not been adequately addressed. State Environmental Planning Policy (Western Sydney Aerotropolis) 2020	The EIS has not adequately addressed the provisions of Clause 2 of the WSP to enable clear demonstration of the beneficial social and economic outcomes to Western Sydney of the proposed development, in this location. The EIS has not adequately addressed the provisions of Clause 12 of the WSP in particular: (a) the aim of this Policy, as set out in clause 2 (refer above) (g) the impact on the physical and visual continuity of the Western Parklands as a scenic break in the urban fabric of western Sydney, (j) the impact on surrounding residential amenity The applicant has also not adequately addressed the provisions of Clause 17 Development on Private Land. The SEPP (Western Sydney Aerotropolis) 2020 was gazetted on 1 October 2020 and the applicant should carry out an assessment of this project against the relevant provisions of the SEPP WSA..
Suitability of the site	The proponent identifies that the main factors in determining the final site location include: Maximising the separation distance to residential areas	Whilst these factors are relevant in determining a suitable site location for an EfW facility, the EIS has not adequately addressed the suitability of the site in relation to its location with the WSP.

EIS Reference	Key findings/Issues	Actions and recommendations
	Zoning of the site Access to transport networks Proximity to the source of the waste Access to a grid and other utility connections Site size and configuration Avoidance of protected airspace Compatibility with surrounding land uses	There is a need to also understand the position of the Parklands Authority

5. Technology and design

5.1 Overview

5.1.1 Concept design and technology selection

For such a major project seeking planning approval, it is unusual to not have a Concept Design Report prepared for the project. One purpose of a Concept Design report is to provide a level of rigour in relation to the technology and design for the EfW combustion technology, flue gas treatment, and power generation systems, and provide a level of detail that cannot be included in the EIS itself. The concept design report also outlines requirements for fuel, consumables, ash management and storage, and provide details of the operational requirements of the facility.

For the unsuccessful Next Gen project, a design report was provided by Fichtner, a well-known and respected consulting firm that specialises in EfW projects. This report also provided justification for the site and plant layout, equipment selection and the data used to support the air and noise assessments.

This level of detail is lacking in the WSERRC proposal as it does not have such a report provided with the EIS. There is no report justifying the equipment selection, rather this is just outlined in the EIS itself. It is not clear which organisation has undertaken this work, which is fundamental in supporting the EIS studies, as it is only reported in the EIS itself, not a separate technical report.

The Fichtner report also contained a detailed breakdown of the design fuel, a level of detail which is not provided in the waste reports prepared for the WSERRC proposal. Significantly, the Fichtner report also contained detailed concept layout drawings of the facility.

In the Merit review for Next Gen, (Arup, 2018), it was stated that:

"*The Fichtner report is titled the Concept Design Report and could be expected to provide the basis of design for the EIS. However, the preferred technology provider Hitachi Zosen Inova (HZI) have provided reference data for the Environ Waste Management Report which at times is inconsistent with the Fichtner report. It would be reasonable to expect that a concept design would have been developed for the proposal that comprehensively and accurately defined the Facility and provided a consistent basis of design for the EIS.*

The proposed technology provider is Hitachi Zosen Inova (HZI). Arup recognise that HZI is a leading company in grate incineration technology, with reference facilities around the world treating MSW and C&I waste. However, the EIS and supporting documentation only outlines a possible concept for a facility and does not define the facility in sufficient detail to allow for a full adjudication to be made on whether the proposal is compliant with International best practice."

This criticism of the level of detail provided by Fitchner about the Next Gen facility design would apply even more so to the WSERRC proposal.

A key issue is that whilst the type of technology to be used is broadly nominated, and architectural plans of the buildings and layout plans have been provided, there is a possibility that the plant layouts may need to be modified once a technology provider is nominated and actually designs the facility.

A concept design report and drawings should have been prepared for the EIS by the nominated technology provider. An architectural design report has been prepared, and some civil design drawings are provided, but there is no concept design report about the technology itself, which is the most critical aspect of an energy from waste facility.

The lack of a concept design report from an energy from waste specialist consultant and of technical input from a nominated technology provider and means that the justification of the technology, and the details provided about how the plant would operate, are only at a very high level.

5.1.2 Reference plants

Despite dozens of EfW facilities operating around the world, only two reference facilities have been nominated (Dublin, Ireland and Filborna, Sweden). According to the EIS, they both 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.

However, Table 5.7 of the EIS only compares the waste types with the Dublin plant, not the Filborna plant. Whilst the waste types are broadly the same, no detailed comparison of waste composition (by %) with the WSERRC Proposal is provided. Also there is not enough information provided about the Dublin plant to be able to verify whether the waste types are actually the same.

The EIS states that air emission data from these reference facilities shows that they perform well below both the NSW and European Union emission limit values for all regulated pollutants. However long term operational monitoring data for some of these pollutants (such as fine particulate matter $PM_{2.5}$) are not provided in Table 5.10 of the EIS, for either plant. The two nominated reference plants have different technology providers.

The Dublin plant uses Hitachi Zosen Inova technology, whilst the Filborna plant uses Babcock Wilcox technology. No assurances are provided in the EIS that these technology providers or equivalently experienced providers would be used. Hence, other less reliable or proven technology providers could be utilised instead, f this facility is approved. Thus, the long term operational reliability of the proposal (combustion and air quality control equipment) is uncertain.

It is noted that there is very little information provided about the Filborna facility, and that the EIS and technical reports are mainly based on the Dublin facility. However, the information for the Dublin facility was in part obtained via a Freedom of Information request, rather than through cooperation with the operators of the Dublin facility (reference Technical Report C, section 5.2.3). Thus there is probably a lot more information that could be made available about the performance of this plant if the Dublin plant operator had been willing to provide performance data.

5.1.3 Control of chlorine levels

According to the EIS, Cleanaway conducted a series of waste audits and laboratory testing of MSW and C&I waste received at the Erskine Park transfer station in 2019. The lab test results for subsamples of separate material components (paper/cardboard, food and garden organics, wood and building materials, textiles, plastics potentially hazardous items and PVC) are combined with audited waste composition to determine the average chlorine content of the overall waste feedstock.

The following average results were determined for the Erskine Park waste:

- MSW average chlorine content (% w/w dry basis): 0.94%
- C&I average chlorine content (% w/w dry basis): 0.43 %
- Overall feedstock mix at 50% - 70% C&I, 50% MSW, average chlorine content (% w/w dry basis): 0.69%.

As the average chlorine content for the intended feedstock mix remains less than 1%, the EIS concluded that the design temperature of 850 degrees Celsius is appropriate.

As no sampling and analysis methodology and information was provided in Technical Report C and Technical Report E, it is impossible to assess how representative is the data.

The EIS also states that some of the waste streams will be subject to sorting and active removal of PVC, although the extent to which this would be undertaken (some or all waste streams) is not clear. It is stated that this would involve building new facilities at either the Erskine Park transfer station (and extending it), or elsewhere.

No firm commitments are made, and the feasibility of extending the existing transfer station is not discussed, but it is noted in the EIS that this would require separate approvals.

5.2 Key findings

Table 5-1 summarises the key issues.

Table 5-1 Technology and design review

EIS Reference	Key findings/Issues	Actions and recommendations
EIS MAIN BODY		
Section 2.6.4.1 and Table 2.4 EfW combustion technologies	Summary of technologies seems appropriate – moving grate thermal plant is most appropriate for non homogenous waste streams, and is a proven technology. Also meets the EfW guidelines criteria of more than 25% energy efficiency.	The lack of a concept design report and of input from a nominated technology provider means that the justification of the technology, and the details provided about how the plant would operate, are fairly high level. Determination of this proposal could possibly need to be deferred until such information is available, and air quality and health risk assessments can be confirmed as being in alignment with the adopted equipment from the nominated technology provider.
Section 2.6.4.2 and Table 2.5 Flue gas cleaning systems	The semi-dry system with an additional wet scrubber is an appropriate choice, as it is an improvement over the semi-dry system, but does not produce vast quantities of wastewater like the wet systems.	This system is superior to the semi dry system proposed by Next Gen in its unsuccessful approval.
Section 2.6.4.3 Oxides of Nitrogen	Selective non Catalytic Reduction (SNCR) of NOx seems appropriate, and ammonia is readily available.	The SNCR system is used in the two Reference plants, however it would be good to know why it is not more widely used, or if it is in fact widely used but not stated as such in the EIS.
Table 5.7	Despite dozens of EfW facilities operating around the world, only two reference facilities have been nominated (Dublin, Ireland and Filborna, Sweden). According to the EIS, they both 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. However, Table 5.7 of the EIS only compares the waste types with the Dublin plant, not the Filborna plant. Whilst the waste types are broadly the same, no detailed comparison of waste composition (by %) between the Proposal is provided. Also there is not enough information provided about the Dublin plant to be able to verify whether the waste types are actually the same.	Additional information about the two nominated reference plants, as well as information from additional reference plants should be provided.

EIS Reference	Key findings/Issues	Actions and recommendations
TECHNICAL REPORT C		
Section 3.6.1 of Waste and Resource Management Assessment – Waste Chlorine levels	Cleanaway conducted a series of waste audits and laboratory testing of MSW and C&I waste received at the Erskine Park transfer station in 2019, and obtained the following average results were determined for the Erskine Park waste: • MSW average chlorine content (% w/w dry basis): 0.94% • C&I average chlorine content (% w/w dry basis): 0.43 % • Overall feedstock mix at 50% - 70% C&I, 50% MSW, average chlorine content (% w/w dry basis): 0.69%. As the average chlorine content for the intended feedstock mix remains less than 1%, the EIS contends that the design temperature of 850 degrees Celsius is appropriate.	This conclusion appears to be logical, however there is not a statistical basis provided for these figures. They are only averages, and the average of MSW was 0.94%, which is not much less than 1%. More details need to be provided regarding the number of samples, as well as statistical data. It may also be prudent to allow for a secondary combustion chamber (to be installed later if needed), if higher temperatures are found to be required.

6. Air Quality

6.1 Overview

The technical report *Air Quality and Odour Impact Assessment - Western Sydney Energy & Resource Recovery Centre (WSERRC*), prepared by Todoroski Air Sciences Pty Ltd, 10 September 2020 (TAS, 2020), has been reviewed.

Overall, the plant design has a number of technologies that address 'best practice' when it comes to flue gas cleaning after the heat exchange for the boiler system. This addresses emissions of toxic and acid gases to a Maximum Extent Achievable (MEA) – as required by the NSW WfE Policy. This, combined with the in-stack limits referenced back to similar plants burning somewhat similar feedstock, provides the pollutant emission rates to be assessed using the Approved Methods:

For conservatism, this assessment has focused on ensuring the proposal can meet the impact assessment criteria for plant emissions at the upper range of the BAT-AELs" (TAS, 2010, p.15).

While rapid temperature quenching is used to reduce dioxin/furan formation via the de novo process, a glaring emission is the need or requirement for a secondary chamber where "the temperature should be raised to 1100°C for at least 2 seconds after the last injection of air" (NSW WfE Policy, 2015, p.6).

The energy efficiency elements of the proposal, perhaps addressed in the Greenhouse Gas technical reporting, concentrates on the incineration technology (moving grate etc) and the use of secondary air injection[1].

The issue of homogeneity of feedstock and ensuring <1% halogenated organic (not stated) is left to a Standard Operating Procedure:

"The active mixing of the waste by trained crane operators is a skilled task that is designed to increase the waste homogeneity, which assists to minimise operation fluctuations around the operational load point and in the load of pollutants and will thus minimise any variation in the emissions" (TAS 2020, p.87).

Several emission rate scenarios are assessed using the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (NSW EPA, 2017) (Approved Methods). A range of scenarios are used as the proposal suffers from the Catch 22 problem that you can't test (stack testing on top of CEMS) the particular feedstock/technology combination until the plant is up and running.

So theoretical emission rates, based on feedstock assumptions and performance of gas cleaning equipment, are tested through the air dispersion modelling process. Despite significant errors being made for the meteorology input files, the design ground level concentration (GLC's) are found to be compliant with the Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales.

These theoretical emission rates are modelled through a dispersion model process consistent with the Approved Methods. Accepting the limitations associated with using a poorly documented and defined meteorological input model, the incremental and cumulative impacts are (as expected) found to be within regulatory limits).

Theoretical emission rates, based on feedstock assumptions and performance of gas cleaning equipment, have been tested through the air dispersion modelling process. Despite significant

[1] "Secondary combustion air shall be injected into the furnace/primary combustion chamber to ensure a complete burnout of the combustion gases" (TAS, 2020, p.87).

errors being made for the meteorology input files, the calculated design ground level concentration (GLC's) are shown to be compliant with the *Approved Methods for Modelling and Assessment of Air Pollutants in New South Wales*. However they cannot be relied upon.

Since the Project design and technology selection is preliminary in nature, the Air Quality assessment results can only be viewed as indicative. Ahead of determining if the feedstock management systems will be able to achieve less than 1 % of halogenated organic material, the decision not to include a secondary chamber is premature.

If it is assumed that a primary chamber achieving 850 degrees Celsius for greater than 2 seconds is sufficient, the post-combustion chamber downstream gas cleaning is comprehensive with all of the targeted reductions being addressed. At a minimum, this requires a functional design (eventually) that is proportionate to industry leading best practice.

While the emission inventory development is problematic, as many input assumptions are unknown, it can only be assumed that gas cleaning technology will achieve high standards (European Union or greater) and meet local regulatory requirements (Protection of the Environment Operations (POEO) Act (1997)t and WfE Policy).

6.2 Key findings

Table 6-1 summarises the key issues.

Table 6-1 Air quality impact assessment review

EIS Reference	Key findings/Issues	Actions and recommendations
Section 2 Study Requirements	The SEAR's are addressed. These are standard and comprehensive as includes the regulatory requirements and also key issues such as "a trip or emergency shutdown" being considered a worst case scenario: "A demonstration that it is technically fit for purpose" has been interpreted as an assessment of BAT (Best Available Technology/Technologies) for air quality purposes. "An assessment of cumulative air quality impacts" is required but also augmented with specific reference to The Next Generation's proposal for an energy from waste facility at Eastern Creek – which may or may not proceed. It is appropriate that the EIS is "prepared in general accordance with the NSW EPA[2] document Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (NSW EPA, 2017)." This incorporates the relevant regulatory framework specific to the POEO Act (1997) and the POEO (Clean Air) Regulation (2010): The Approved Methods discuss 'worst-case' emissions in the context of a Level 1 assessment (which precedes a Level 2 assessment of site-specific (usually 'normal' operations). However, the SEAR's require the extra detail of 'worst-case' including "a trip or emergency shutdown".	Nil
Section 2 Study Requirements - specific	Specific requirements from NSW Health and Blacktown City Council enhance the theme on 'best practice' by referring to the Environment Protection Authority's NSW EfW Policy (2017) and the "the relevant NSW/Australian and European Union (EU) emission controls." These are later (section 4) used in the technical report relating to: European Directive 2010/75/EU of the European Parliament and the Council on Industrial emissions (EU IED, 2010); Best Available Techniques (BAT) Reference Document for Waste Incineration Industrial Emissions Directive 2010/75/EU Integrated Pollution Prevention and Control. These are important 'Study Requirements' as they bring into play 'best practice' including for in-stack emission limits (such as the 0.1 ng/m3 limit for dioxin/furans), a secondary combustion chamber if 1% of halogenated organic	Nil

[2] Section 2.2 is titled "2.2 NSW Environmental Protection Authority requirements". "Environmental" is a typographical error as it should be 'Environment'.

EIS Reference	Key findings/Issues	Actions and recommendations
	substances in the feedstock (NSW EfW Policy) and the use of a 'reference facility' for an emission inventory.	
Section 3.1 Proposal setting	It is noted that the siting is substantially industrial (and predominately non-residential) and so has a decent buffer zone (sometimes referred to as a separation distance in other jurisdictions). Maximum gaseous compound impacts will be expected near to ten times the stack height – so 750 m to a kilometre (the latter to allow for extra plume height due to thermal buoyancy). So, a "3 km radius of the proposal used for identifying specific receptors" is sufficient. The nearest residential area around one kilometre to the south is the most critical including a childcare centre approximately one kilometre to the west. The deposited particulate matter to the Prospect Reservoir is not expected to be significant. The Austral Bricks facility located to the southeast has a significant stack (point) emission source that may be as significant as the hypothetical The Next Generation's proposal – especially for HF (Hydrogen Fluoride; required to be continuously measured by the NSW EfW Policy). These emissions are too lightly dismissed in section 6.10 as being "reflected relatively well in the background data". "A ridgeline to the south of the site" may be susceptible to plume strikes on elevated terrain and needs to be modelled well by CALPUFF using a well-defined terrain elevation file).	Include emissions from the Austral Bricks facility for 'background' similar to how NextGen has been treated (emissions such as HF will not be double accounted in the assumed 'background').
Section 3.2 Proposal description	It is noted that various 'load points' (LP1 to LP9) are identified with these being a function of input tonnes per hour (t/hr) of waste and varying calorific value. This has serious implications for a 'reference facility' as the worst-case scenario needs to be identified[3]. Moreover, if the feedstock does not have an homogenous mix of residual municipal solid waste (MSW) and residual commercial and industrial (C&I) waste, how can the 'worst-case' emissions be determined as well as a determination and certainty that 1% of halogenated organic substances is in the feedstock? The latter has implications for the furnace and downstream pollution control equipment.	Improve the accuracy of the emission estimate to be a realistic 'worst case' for normal operation for the feedstock feeding into the (designed) plant technology. Improve the determination and certainty that above or below the threshold of 1% of halogenated organic substances is in the feedstock.
Section 4.1 NSW EPA impact assessment criteria	The assessment criteria are directly from the Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (NSW EPA, 2017). This is appropriate as it follows the 'approved methods'. Most of the criterion (except for a time average conversion) are copied directly from the EPA Victoria State environment protection policy (Air Quality	Hourly averaged impacts from PM_{10} and $PM_{2.5}$ and 3-minute TSP impacts be assessed as a benchmark using similar jurisdiction criteria (suggest the State environment protection policy (Air Quality

[3] "The measured emissions from the comparable reference plant in Dublin, are much lower than the levels modelled in every assessed scenario" (TAS 2010, p.10).

EIS Reference	Key findings/Issues	Actions and recommendations
	Management) with the addition of annual and daily criteria from other jurisdictions (primarily the population exposure standards from the National Environment Protection (Ambient Air Quality) Measure. This has resulted in the hourly criteria for particulate matter (TSP as a nuisance dust, PM_{10} and $PM_{2.5}$) not being assessed. This is a weakness of the Approved Methods compared to other jurisdictions assessing particulate matter from point sources over shorter time frames than daily.	Management); as selected parameters in the Approved Methods are from this source).
Section 4.2 NSW Energy from Waste (EfW) Policy requirements	Key elements from the NSW EfW Policy are documented. These include, as appropriate for Air Quality: Best Practice Two reference facilities, one in Dublin, Ireland and the other in Filborna, Sweden In-stack air emission limits: The NSW Government Protection of the Environment Operations (Clean Air) Regulation 2010 (POEO, 2010) European Directive 2010/75/EU of the European Parliament and the Council on Industrial emissions (EU IED, 2010) Best Available Techniques (BAT) Reference Document for Waste Incineration Industrial Emissions Directive 2010/75/EU Integrated Pollution Prevention and Control It is difficult to apply some emission limits across jurisdictions due to the averaging times used – continuous, hourly, daily and annual. This section does not have any discussion about the NSW EfW Policy concerning a secondary combustion chamber if 1% of halogenated organic substances in the feedstock. However it is noted that this is justified in Section 3.6.1 of the Waste and Resource Management Assessment.	Determine if a secondary chamber is required by a definitive statement on being above or below the threshold of 1% of halogenated organic substances is in the feedstock
Section 4.4 Odour	There are two odour pathways of concern (TAS 2020, p.65): “arising from trucks delivering waste and collecting residue”, and “from the opening of the bunker room doors where the waste is contained.” As odour is an amenity issue rather than health based, assessing it using odour units (OU) meeting regulatory guidance (1-second nose response) is entirely satisfactory. Moreover, odour to the levels expected and predicted in an industrial zoned area are essentially low risk.	As odour is expected to be low (if it is controlled as advertised), the issue can be dealt with via a Planning Permit condition to not cause off-site odour.

EIS Reference	Key findings/Issues	Actions and recommendations
Section 5 Existing Environment	The existing environment is characterised into meteorology (identified as climate) and background pollutant levels. The Horsley Park Equestrian Centre AWS is the closest located Automatic Weather Station (AWS) to the site. It is wrongly identified as “approximately 3.5 km northwest of the proposal” (TAS 2020, p.19) when it is in fact to the south. The direction does not matter as it is the most site-representative dataset but hopefully the correct coordinates were used in the modelling. 2015 is selected as a representative year. Year selection is immaterial to a modelling exercise except that the Approved Methods say that you should compare the selected year to a longer (>5 year) record. Prospect (6.1 km) and St Marys (8.6 km) are the closest Air Quality Monitoring Stations and provide good background data for the project. All $PM_{2.5}$ monitoring stations in the Sydney airshed record exceedances of the annual National Environmental Protection Measure (NEPM) standard. This results in some additional analysis needed to determine the project incremental impact.	Confirm that the Horsley Park Equestrian Centre AWS data has been included in the CALMET model with the correct coordinates.
5.3.2 Proposal monitoring	Two monitoring stations were established short term (three months) closer to the site than the regulatory monitoring. The technologies used (gases and particles) are both not reference standard instruments. Only low reliance can be placed on the data despite the claim made, without any data provided, that “readings were proven to be suitably similar to the reference standard measurements” (TAS 2020, p.30).	Nil
Section 5.3.3.2 TSP and Deposited Dust	An illogical argument is used to estimate background TSP and dust deposition from a single measured annual average of PM_{10}. This is a simple scaling exercise using the criteria from the Approved Methods. It does not work as the criteria are based on health/nuisance impacts and do not apply across particle size fractions. Entirely different values are produced if you use the $PM_{2.5}$ annual average as that ambient level is already above the criterion. If a $PM_{2.5}$ annual value was not available then the methodology would predict annual $PM_{2.5}$ at 5.6 ug/m^3 instead of 8.2 ug/m^3. Nonetheless, the summary of ambient background levels used (section 5.3.3.4) is conservative in nature.	Accepted the background air quality levels listed in Section 5.3.3.4 (as they are suitably conservative).
Section 6 Dispersion Modelling Approach	The CALPUFF model, supported by the diagnostic meteorological CALMET model informed by the prognostic TAPM model, is used. CALPUFF is a model supported by the Approved Methods guidance. However, that is for when the	Only accept that CALPUFF is a suitable model if the input CALMET data is determined (calculated) better.

EIS Reference	Key findings/Issues	Actions and recommendations
	standard regulatory model is not appropriate. No case is made for why CALPUFF is preferred other a Gaussian model. Most significantly, the choice of model to support complex terrain situations does not occur as the tall stack source is above the ground level receptors.	Otherwise, adopt the AERMOD model as a suitable Gaussian dispersion model as an alternative to the Approved Methods preferred of AUSPLUME – subject to quality meteorological input data being made available.
Section 6.2.1 Meteorological modelling	Notwithstanding that a Gaussian model (AUSPLUME or the newer (not in Approved Methods) AERMOD) is not used (it is possible because site-specific data is nearby and able to be supported by nearby cloud cover data), CALMET appears to have been chosen to provide spatially varying wind fields – albeit complex terrain is not involved. Since the stack plume will be well elevated, the CALMET/CALPUFF model suite is only a better choice if the input data away from the surface is of a high quality. Several errors have been made in the meteorological modelling such that only low reliance can be placed on the predictions. The TAPM model run is according to guidance in the Approved Methods with the addition of 10 more levels in the vertical (up to 5000 m). However, TAPM has a known bias to predicting too low wind speeds at the surface – especially in urban locations. The predicted annual wind rose at the site (Figure 6-3) is sufficiently different from the measured annual wind rose at an AWS just 3.1 km away (from Figure 5-2) to indicate serious issues with the meteorological modelling used. The annual average wind speed for the site data is not provided but it will be significantly lower (more than can be accounted for a slightly different location) than the measured value (also not provided). The seasonal wind roses from Figures 5-2 and 6-3 also showed significant differences not accountable for physical effects and highlight serious error bars in the modelled wind fields. A close examination of the provided model settings provides some hints as to what went wrong: Table 6-1 provides a list of the surface observation stations used in modelling. However, RMAX1 in Table 6-2 is set to no more than 10 km. Only St Marys, Prospect and Horsley Park meet the criteria to be used in CALMET surface interpolation at the site – all other stations are a waste of time as input to the site winds. Nesting of model runs is used to set boundary conditions – this does not work well for a diagnostic model such as CALMET.	Significantly improve the meteorological data modelling used to drive the dispersion model (either CALPUFF or AERMOD).

EIS Reference	Key findings/Issues	Actions and recommendations
	The seven critical parameters used in the CALMET modelling of Table 6-2 are from Generic Guidance and Optimum Model Settings for the CALPUFF Modelling System for Inclusion into the 'Approved Methods for the Modelling (sic) and Assessments of Air Pollutants in NSW, Australia, March 2011 (Barclay and Scire, 2011) – this is not referenced. The TERRAD value is somewhat immaterial as the terrain is not a significant factor at the expected plume heights. An IEXTRP value of -4 means that no upper air data (apart from that provided by TAPM) is used. This is a mistake for an elevated plume just over 30 km from the upper air site at Sydney Airport. Only eight BIAS level values are provided. This suggests that only eight vertical levels used in CALMET and they are not documented. This limits the ability of the model to resolve the wind shear with height up to the plume height from a tall stack. Mixing heights often exceed 1500 m (see Figure 6-4). The R1 radius of influence value is set too low resulting in not enough correction occurring of the too-low TAPM wind speeds. A meteorological grid resolution of 100 m is too low for the model capabilities. Terrain features to this scale are not significant for a plume source (with plume rise) close to 100 m above the surface. The NSW Approved Methods guidance is to not go below 150 m and then only for when "dominant terrain features are not resolved" (Barclay and Scire, 2011, p.18). The light winds produced by TAPM and the interpolation method of the nearest AWS sites, results in a poor determination of stability classes – see Figure 6-4. Over 40% of F-class (very stable) with only 15% D-class (neutral) will never happen in an urban environment. The excessive very stable conditions at night, where the mixing height rarely exceeds 50-100 m (see Figure 6-4) results in the plume always being above the temperature inversion and not coming to ground in these conditions whereas neutral conditions will see greater plume impact at night. Figure 6-1 has a visualisation of a wind field generated by CALMET for a still winter night (3 am 12 June 2015). It is claimed "The wind fields are seen to follow the terrain well" (TAS, 2020, p.35). A close examination indicates that several meteorological laws are broken and the light winds are almost exclusively from the southwest quadrant – whereas there are many slopes on ridges with different orientation aspects. For example, the ridge running north from the site has very light winds coming out of the valley around the Next Generation Energy pit with	

EIS Reference	Key findings/Issues	Actions and recommendations
	enough momentum to get up and over the ridge and flow (even accelerate) to the east – this is NOT following the terrain as claimed.	
Section 6.2.3 NOx conversion	The NOx to NO2 conversion method chosen is the third method from the Approved Methods – the Janssen et al. (1988) empirical equation for estimating the oxidation rate of NO in power plant plumes. The USEPA have moved on from this method for modelling using their AERMOD model. The empirical equation now is ARM2 and is a function of the NOx concentration. This is international best practice unless you have hourly Ozone and NOx data. The latter is available at Prospect, so the Approved Methods Method 2 of the Ozone Limiting Method (OLM) would be a better choice.	For NOx to NO2 conversion, activate the OLM method in CALPUFF by providing ambient data on ozone and NOx.
Section 6.4 Modelling scenarios	A plethora of scenarios are presented all based on theoretical output rather than what is proposed or will eventually be emitted. As no actual plant design, other than that off-the-shelf technologies consistent with BREF4 will be used, an emission inventory for the plant is not possible with the provided information. This is the aim of the NSW EfW policy by using of a reference facility. Since the TAS (2020) assessment uses theoretical upper limits as outputs (several variations), they are not able to build an emission inventory as required by the Approved Methods (Section 9.3). An argument is then mounted that the real emissions will be lower so the approach is conservative.	The approach is similar to when a 'Reference Design' is put forward for planning approval. The Authority (or a ministerial appointed Panel/Committee) has the option to approve and then require commissioning tests after the plant is built. Otherwise, it is recommended that the proponent provide "The operational parameters of all emission sources" (Approved Methods, p.42) and these are modelled.
Section 6.4 Modelling scenarios	"The assessment modelled a combined flue with an equivalent diameter of 2.8m at a stack height of 75m" (TAS, 2020, p.40). This short-cut method places two flues in the one chimney and combines them into an equivalent sized 'single' point source. This is an assumption that the two flues next to each other immediately interact without any additional plume rise enhancement.	A sensitivity analysis is conducted comparing the combined flue against two side-by-side flues (with or without additional plume rise).
Section 6.5 Modelled Emissions	Table 6-6: provides 'Design/ Modelled stack emission concentrations' for the three scenarios related to regulated emission rates. The half-hour scenario is the most useful as it is the maximum emission rate (normal conditions). It is also the most conservative because averaging over longer time periods does not match with the worst-case meteorology that the Approved Methods process is trying to identify.	Treat the longer-termed averaged emission rates as 'for information' only.

[4] BREF: Best Available Techniques (BAT) Reference Document for Waste Incineration Industrial Emissions Directive 2010/75/EU Integrated Pollution Prevention and Control. (Termed "BAT-AELs" by TAS (2020).

EIS Reference	Key findings/Issues	Actions and recommendations
Section 6.5 Modelled Emissions	"Total Suspended Particulates (TSP) emissions are assumed to comprise of 98% PM_{10} and 95% $PM_{2.5}$" (TAS, 2020, p.41). This assumption is taken from the reference facilities – which may or may not represent what is eventually built or the operational mix matches.	Nil
Section 6.5.4 Comparative emissions levels from the Dublin Reference facility	It is taken as read that "the reference facility for the proposal … has a similar modern design and processes similar types of waste at a similar rate" (TAS, 2020, p.45). Assumptions on emissions rates being conservatively less than regulatory requirements are supplemented by assumptions from the reference facility on 'fixed' stack variables such as exit temperature and volumetric flow rates.	How relevant the reference facilities are is dealt with by others. Stack parameters will be in the ballpark.
Section 6.6 Construction phase	A qualitative assessment of construction impacts only is preformed and documented in Section 6.6.2 and uses assumptions from the British (Institute of Air Quality Management guideline: Guidance on the assessment of dust from demolition and construction (IAQM, 2014). All risks are assessed as low. This is acceptable primarily on the distance to sensitive receptors likely to have health or ecological (dust fallout into Prospect dam) impacts Section 6.6.3 is an attempt at a qualitative modelling assessment. No details are provided on how the Table 6-17 dust emissions in total kilograms are derived or distribute (timeframes). Essentially this is an exercise having a guess at the impacts to confirm that they are as low as the qualitative assessment suggests.	Accept the low risk of construction impacts and control with a Planning Permit condition not to cause off-site impacts.
Section 6.7 Commissioning	Testing during commissioning (and regular stack testing – monthly, quarterly etc) are standard means to confirm that the project has been built as proposed. The NSW EfW Policy specifies that there needs to be a CEMS system for the plant: "There must be continuous measurements of NOx, CO, particles (total), total organic compounds, HCl, HF and SO2" (EPA, 2015, p.6). There is no mention of CEMS in this section of the TAS (2020) document – this is left until Section 8.	Issued environmental licence to include conditions around CEMS and regular stack testing upon commissioning and thereafter operation.
6.9 Odour	Fugitive odour is assessed as two pathways: trucks delivering waste and collecting residue opening of the bunker room doors. Due to the distance to sensitive receptors (residences and assuming that industrial locations have a higher tolerance of odour) and the expected low odour	Attention to detail in the planning/environmental permit for roller door controls – consideration of fast acting, double doors and/or negative pressure building with extracted air passing through to the furnace.

EIS Reference	Key findings/Issues	Actions and recommendations
	emissions from controllable sources, the assessment that odour is of low impact is acceptable. A negative pressure air system is only to work when the furnace is operating. Consideration should be given to an alternative OCU (carbon canister etc) for when waste is accumulating in the building when the furnace is off-line.	
Section 6.10 Other sources	As required by the SEAR's, other projects, including the Next Generation Energy from Waste Facility, have been considered. It would be rare that the plumes from stacks greater than three kilometres apart would line up so that significant impacts from a more distant stack source would increase ground level concentrations. This is demonstrated by the assessment. However, the Austral Bricks site is dismissed despite its major stack source being within a kilometre and some pollutants not accounted for in the background data (hydrogen fluoride for example).	Include the Austral Bricks emissions in the cumulative modelling.
Section 7 Dispersion Modelling Results	The entire section is hostage to the dispersion meteorology and the emission rate estimation (excluding the impact of 'background' and other sources being minor contributors for all but particulate matter) being based on theoretical, rather than actual, worst-case emissions. Nevertheless, calculated impacts are low enough that errors in the meteorology and error bars on the emission rate will be unlikely to push ground level concentrations outside of criteria concentration levels.	Assessment is repeated with the fixes and adjustments identified above.
Section 7.6 Proposed Licence Limits	The proposed licence limits are reasonable and are essentially a proxy for the reference facilities and technology assumptions not being able to be determined with enough confidence to limit the error bars in the predictions. That leaves the assessment at the mercy of a Catch-22 that the plant is built and starts operation with the possibility that post-commissioning emission rates are then found to be above the licence limits.	Stipulate that extra plant controls (such as a secondary combustion chamber) can be retrofitted if stack testing and CEMS data demonstrates exceedances of the licence limits.
Section 8 Mitigation and Management	All mitigation and management measures are welcome as this fits the mantra of Beast Available Technology controls.	

7. Human Health

7.1 Overview

Overall the technical document prepared by Environment Risk Sciences (EnRiskS) is well written, clear and concise and transparent. The document follows the required methodologies of assessing health risk from air emissions in NSW. All the key exposure pathways and risk have been identified and properly quantified.

The main EIS documentation also reflects what is documented in the technical report.

The one main uncertainty is that heavy PAHs has not been included in the list of chemicals assessed. Heavy PAHs like benzo(a)pyrene are difficult to destroy, and therefore is unlikely to be 100% combusted in the process. Like the metals, 100% capture in emission control is not possible resulting in low level release. A technical discussion should be presented why PAHs is not included.

7.2 Key findings

Key findings are reported in Table 7-1 below. The report indicates there are no unacceptable risks from emissions from the proposal. This is correct based on the information presented in the technical report.

It should be noted that the results of the health risk assessment are reliant on the results of the air dispersion modelling. Thus any changes resulting from the review of the air quality assessment (which is only currently based on an indicative plant design with no input from specifically nominated technology provider or concept design report by an EfW specialist consultant) will have follow on impacts on the health risk assessment.

Table 7-1 Human health impact assessment review

EIS Reference	Key findings/Issues	Actions and recommendations
TECH REPORT B		
1.2 and 1.3	The report presents appropriate objectives of the assessment and references the correct methodology to be used, that being EnHealth 2012. The report also makes reference to other relevant guidelines including NEPM Air Toxics, and the NEPM Air Quality. What is missing is the NEPM Assessment of Site Contamination (NEPC, 2013) which is relevant to exposure through direct contact with soil.	
2.3.5	Report states “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”. Key chemicals of concern that fit in this category, like dioxins should be mentioned here.	
3	The report provides a good representation of the local population and appropriately identifies the sensitive receptors surround the site, although Prospect Reservoir has not been mentioned here.	
4.1-4.4	The report provides a good description of the exposure mechanisms and pathways. Table 4 provides a reasonably good list of chemicals of potential concern. However PAHs are not listed. Heavy PAHs like benzo(a)pyrene can be difficult to destroy and is not usually 100% efficient, therefore it is expected there would be some residual PAHs emitting from stack attached to particles.	A technical discussion should be presented why PAHs is not included.
4.6.4	It is noted that emission estimates are conservative. Maximum half hour average emission rate was assumed to occur over the full hour, all VOC was assumed to be benzene (one of the most toxic chemicals of the VOCs), and chromium as all hexavalent form (the most toxic).	
5.2	Dust emission during construction is discussed, with emissions being modelled by Todoroski Air Sciences (2020). Dust suppression methods are discussed which is an appropriate way of addressing these issues during construction.	
5.3	The report presents a good summary of the modelling results of criteria pollutants SOx, NOx, CO, $PM_{2.5}$ and PM_{10}. For the gases total emissions from the proposal and background levels are below guideline level. For $PM_{2.5}$ and PM_{10} background levels already meet	

EIS Reference	Key findings/Issues	Actions and recommendations
	guideline levels. The report adequately shows that the added contribution by the proposal is insignificant.	
5.4.1-5.4.2	The report presents the pathways for other pollutants, inhalation, soil ingestion, dermal, homegrown milk, meat, vegetable, tank and water. These are appropriate for the scenarios investigated. The exposure parameters presented in Table 18 are in line with national guideline documents.	
5.4.3	The inhalation exposure appropriately uses the 1h average modelling results to assess against short term risk criteria, and annual average results to assess against long term chronic risks. Cumulative risk (sum of HQ) has been appropriately undertaken, and cancer risk has been assessed appropriately for benzene (total VOC).	
5.4.4	Offsite, risks were estimated for oral and dermal resulting from deposition in ground surface. This is appropriate even for commercial zones. For residential locations risks were calculated for direct contact as well as fruit and vegetable and poultry eggs. For hobby farms cattle milk and meat has been included. These are all appropriate for the scenarios investigated. Rain water tanks have also been included for residential, commercial and farming properties.	
5.4.4.7	Prospect reservoir was assessed for deposition and drinking water. This was undertaken appropriately.	
6	An assessment of emission impacts due to transport of waste to the facility was undertaken. The modelling was undertaken by Todoroski Air Sciences, which indicates negligible changes in air pollutants.	
A	The report resents the methodology for incremental risk from increase in $PM_{2.5}$ emissions. The methodology is appropriate.	
B2	The short term inhalation toxicity criteria sources are appropriate.	
B3	The chronic toxicity reference values are appropriate. However, the carcinogenic unit risk for benzene has been omitted.	
B4	The inhalation pathway exposure equations and parameters are correct and appropriate.	
B5	The uptake of chemicals in soil, plant, meat, milk and eggs is based on algorithms presented by OEHHA 2015. These algorithms are those specified by NSW EPA air risk assessment guidelines and are appropriate to use. Exposure calculations are also supplemented by	

EIS Reference	Key findings/Issues	Actions and recommendations
	the NEPM Assessment of Site Contamination (2013) which is also appropriate. The steady state mass balance calculation for rain water tanks and Prospect Reservoir is also appropriate.	
C	The modelling calculations undertake the discussed scenarios. Parameters and calculations appear correct.	
EIS		
Exec sum, human health risk	Executive summary correctly summarises negligible health risk from all the areas it considered and detailed in the technical document B.	
Executive summary, cumulative impacts	The report states that cumulative emissions from the proposal and the Next Generation proposal are within air quality criteria. This is correct based on the information presented in the technical document B.	
9.1	The report outlines the key guideline documents. However, like in the technical document it is omitted by the NEPM Assessment of Contaminated Sites (NEPC, 2013).	
9.2	This section replicates the demographic information presented in the technical document adequately.	
9.3.1	Emissions from construction activities are briefly discussed, referring reader to Air Quality technical report for details.	
9.3.2.1	The list of chemicals mirrors the list in the technical document. However, as previously stated, it is unclear why PAHs has not been included in the list. A technical reason should be discussed why PAHs is not considered to be a chemical of concern given its toxic nature.	
9.3.2.3	Criteria pollutants adequately summarises the technical document, showing low contribution from the proposal to existing concentrations.	
9.3.2.4	For other gases, and non-volatiles adsorbed to particles, short term and long term risks are adequately characterised by receptor/land use, exposure pathways considered, and risk characterisation using appropriate calculations and exposure parameters. The results presented in the main report mimic that in the technical document.	
9.3.2.5	The section adequately summarises the section presented in the technical document, which effectively summarises the results from the air quality assessment.	

EIS Reference	Key findings/Issues	Actions and recommendations
9.3.3	The report indicates there are no unacceptable risks from emissions from the proposal. This is correct based on the information presented in the technical report.	

8. Noise

8.1 Overview

The technical report *Noise and vibration Impact Assessment - Western Sydney Energy & Resource Recovery Centre (WSERRC*), prepared by ARUP, 24 August 2020, has been reviewed.

The noise and vibration technical report has been prepared to address the SEARs and includes the following:

- Identification of sensitive receivers and background noise monitoring. Residential receivers have been identified to the south east of the site across the M7. One location was used to measure background noise and existing traffic noise. The residential receivers have been classified as 'urban' due to existing traffic from the M7, which sets a higher noise criteria than a suburban or rural classification.
- The operational noise assessment predicts minor non-compliances and recommends mitigation is considered in detailed design.
- No operational vibration impacts were identified and recommended mitigation measures incorporated for the turbines and air cooled condensers.
- A construction noise and vibration assessment has been undertaken. Although some receivers may exceed the noise management levels appropriate mitigation measures have been recommended to manage construction noise and vibration.
- The road traffic noise assessment for construction and operations predicts compliance with the noise criteria.

The assessment concludes that while the detailed information regarding plant and equipment is not fully known at this stage, all plant and equipment can be designed to comply with established criteria.

The method for developing the operational noise criteria has been reviewed. It is our opinion that the approach for setting the amenity category as 'urban' may not be appropriate for all receivers in the area, particularly those set back further from the M7. It is recommended that the amenity categories are confirmed in consultation with the regulator with consideration to adopting the High Traffic Project Amenity Noise Level. A validated traffic model of the M7 should be used to quantify the road traffic noise exposure to justify the adopted amenity category and criteria.

The assessment predicts minor exceedances to the operational noise criteria, however these exceedances could increase subject to review of the adopted amenity criteria. The assessment discusses the impacts and recommends they are addressed in detailed design. However the assessment does not provide information regarding:

- details of all reasonable and feasible mitigation measures with quantification of the expected noise reduction.
- Assessment of any residual impacts in accordance with Section 4 of the Noise Policy for Industry (NPfI).

8.2 Key findings

Key findings and recommended actions have been provided in Table 8 1. Although some technical issues have been identified and recommended actions proposed, it is our opinion that the project can be designed to achieve compliance with any imposed noise limits or conditions.

Table 8-1 Noise impact assessment review

EIS Reference	Key findings/Issues	Actions and recommendations
Noise and Vibration Technical Report Section 4.1.2	The residential receiver area has been classified as Urban for establishing the amenity criteria with a Project Amenity Criteria of 40 dBA LAeq (period). Although this may be appropriate, for receivers directly adjacent to the M7 which are exposed to high road traffic noise, receivers further setback from the M7 may not necessarily fall within this category. If road traffic noise is controlling, the amenity criteria should be established based on the High Traffic Project Amenity Noise Level as per NPfI Section 2.4.1 and Fact Sheet E, Case Study E2. For receivers further setback from the M7, the amenity criteria should be established based on the appropriate description in consultation with the regulator.	The Urban amenity criteria should be reviewed in consultation with the relevant planning authorities (as stated in the NPfI Page 12). It is recommended that the High Traffic Project Amenity Noise Level (where appropriate) in combination with the Suburban Amenity Criteria be adopted, instead of the Urban amenity criteria.
Noise and Vibration Technical Report Section 4.1.2	It is noted that noise monitoring ML2 may be influenced by road traffic noise from the M7 however this could be influenced by other noise sources (such as birds and insects which were identified as a controlling noise source in Section 3.2 paragraph 3). A validated road traffic noise model to confirm road traffic noise contributions from the M7 has not been prepared. The road traffic noise levels would vary at different receivers, and only one location has been reported for noise monitoring.	A validated road traffic noise modelling should be undertaken to confirm road traffic noise emissions from the M7 at all potentially impacted receivers if the High Traffic Project Amenity Noise Level is to be applied.
Noise and Vibration Technical Report Section 3.2	The assessment relies on a single noise monitoring location which may be insufficient for a complex noise environment, with multiple surrounding residential receivers.	Consideration for addition noise monitoring, if required for establishing existing road traffic noise levels.
Noise and Vibration Technical Report Section 3.2	The report does not present any attended noise monitoring results in the area to support the following statement, “The ambient environment was controlled by the traffic noise on the M7 motorway and by wildlife (birds and insects).”	Details of attended monitoring and observations should be provided to confirm the controlling noise sources in the area.

EIS Reference	Key findings/Issues	Actions and recommendations
	It is unclear if attended monitoring was undertaken during all time periods (day, evening or night).	
Noise and Vibration Technical Report Section 4.1.5	The project amenity criteria for child care centres (K1) has been set as 50 dBA LAeq(1hr). The NPfI amenity noise level is 35 dBA (internal) for school classrooms and the project amenity criteria would be 30 dBA (internal). Typically a 10 dBA reduction outside to inside is applied as a screening test which assumes open windows, rather than the nominal 20 dBA reduction proposed for closed windows (unless the facility has been consulted and confirmed the windows are non-openable). This would set the external Project Noise Trigger Level at K1 to 40 dBA LAeq(Noisiest 1hr). It is noted that the predicted noise levels exceed 40 dBA during noise enhancing conditions.	It is recommended that the Project Noise Trigger Level for K1 is reviewed and if other guidance is used, then this should be documented.
Noise and Vibration Technical Report Section 4.3	The Project Noise Trigger Level at the childcare centre is a LAeq(Noisiest 1hr) criteria. It is expected to be similar to the LAeq(15min) noise levels used for the intrusive assessment. The predicted amenity noise levels in Table 14 appear to consider the LAeq(day) noise levels rather than the LAeq(Noisiest 1hr) noise levels.	The predicted noise levels at K1 should be confirmed, and modelled as a LAeq(Noisiest 1hr) noise level.
Noise and Vibration Technical Report (Figure 1 and Table 2)	There is a light blue Educational Facility shown in the figure to the north east of the site. This receiver is not labelled or discussed in Table 2 of the report.	Clarify/assess the receiver marked on Figure 1 to the north east of the site.
Noise and Vibration Technical Report Section 4.3	Predicted exceedances have been identified at receiver R1. The SEARs , BCC and EPA requirements requires the assessment to consider management and mitigation measures. The assessment does not provide information regarding:	It is recommended that the operational noise assessment is updated to include quantification of the noise levels after implementation of reasonable and feasible mitigation measures and assessment of any residual impacts.

EIS Reference	Key findings/Issues	Actions and recommendations
	• details of all reasonable and feasible mitigation measures with quantification of the expected noise reduction. • Assessment of any residual impacts in accordance with Section 4 of the NPfI .	
Noise and Vibration Technical Report Section 4	The following noise modelling parameters could not be found: Ground absorption parameters adopted.	The adopted ground absorption parameter used for modelling should be provided.
Noise and Vibration Technical Report Section 4	The NPfI Section 3.3.1 recommends that noise contour plots are provided in 5 dBA increments. No noise contour plots have been provided.	It is recommended that noise contour plots are included in the assessment report.

9. Energy from Waste Policy/Waste

9.1 Overview

The technical reports *Waste and resource management assessment report*, prepared by ARUP, 10 September 2020, and Waste flow analysis for Greater Sydney, prepared by Arcadis, 18 September 2020 have been reviewed with respect to type and quantity of waste that the WSERRC is projecting to have access to.

These technical reports have been prepared to address the SEARs and indicate on the surface that the project may in future have access to feedstock from residual waste from resource recovery processes.

Under the EfW Policy a range of rules are provided on the per centage (%) of residual waste which is eligible for burning and recovering a portion of its embodied energy. The range is from 100% in cases where MSW and C&I waste have specified at source separation of recoverable waste as this is the most effective way to recover valuable materials from waste. It scales down to 50%, 40% and 25%, 10% and 5% for less source separation and subsequent recovery from mixed and source separated waste, respectively.

The EfW Policy deliberately and sensibly seeks to ensure that the recovery, reuse and recycling of waste are prioritised over energy from waste and landfilling.

The proposal does not appear to have access currently to eligible MSW or C&I waste in the quantities sought and speculates on a range of scenarios which may result in it accessing enough eligible waste to meet the incinerator's capacity. It bases its waste availability assessment on the potential future ability of Cleanaway to win municipal waste contracts and secure C&I waste, which would be highly contested by other competitors.

The modelling of speculative quantities of eligible waste is based on a range of postulations, data sources and includes unpublished data from Cleanaway. This is both subjective and impossible to independently assess. The waste study suggests incoming waste could be sourced from the Greater Sydney Region, which stretches as far as Shoalhaven City Council to Newcastle City Council areas and appears to be based on the metropolitan levy area. This seems possible, but this adds additional uncertainty about being able to obtain sufficient waste and for some locations may be in conflict with the Proximity Principle under the Protection of the Environment Operations (Waste) Regulation 2014.

The EIS also assesses accessing waste from the Sydney basin which is the more likely situation.

The EIS states the source MSW waste for Mixed Waste Organic Outputs (MWOO) as a possible source of fuel. The proposed Next Gen facility (for which SEARs have just been obtained), also nominates MWOO as a source of fuel. It is therefore unclear whether the same waste is being counted by both EfW projects.

One of the reasons for refusal of the Next Gen facility approval (of similar capacity to the WSERRC at 552,500 tpa) was that the sources of waste were not well defined, and it appeared that there was insufficient eligible waste of the nominated type to fuel the facility. It is noted that the modified Next Gen facility (for which SEARs have been granted) proposes to have a throughput of only 300,000 tpa, to address one of the reasons for refusal, that insufficient eligible waste was available.

Thus it may be appropriate for the capacity of the proposal to be reduced from the proposed 500,000 tpa capacity, to address the similar issue with waste sourcing or potentially delay its commencement until such time as sufficient eligible waste is confirmed to be secured.

The proposal seeks to relax some of the requirements of the NSW EfW Policy with respect to MSW, without the investment in additional resource recovery activities. This could have the effect of resulting in 'mass burn' disposal of MSW which is contrary to one of the overarching principles in the NSW EfW Policy.

It is also unclear how the sought C&I waste would be confirmed to meet the eligibility criteria of 100% 'where a business has separate collection systems for all relevant waste streams' as required under the NSW EfW Policy. The EIS suggests that one of the ways this would be independently achieved is it would be approved by the EPA. However, the generators of C&I waste in the main are not required to be licensed by the EPA and as such it is unclear how this requirement would be independently overseen.

The recovery, reuse and recycling of waste are prioritised under NSW EfW Policy, in recognition that they can achieve superior sustainable outcomes.

A significant potential consequence of the WSERRC (if approved) is it could make it more difficult (or delay) future waste recovery, reuse and recycling projects.

Future resource recovery and recycling projects would have to compete in the market with the proposal. This situation would be compounded by the idea mentioned in the EIS to lower the criteria for eligible waste, by not having to recover valuable resources from MSW.

Resource recovery, reuse and recycling projects would have to compete with landfill operators, however the landfilled waste in Sydney and many other areas of the State (including the Greater Sydney Region) is subject to the full waste levy rate. This compares to the WSERRC which may at most be subject to about 20% of the waste levy should all the ash be landfilled.

In the late 1990s and early 2000s there was a race to obtain approval for putrescible waste landfills to accept and dispose of Sydney's putrescible waste. The government at the time introduced State Environment Planning Policy No. 48 (SEPP 48).

SEPP 48 created a requirement that an applicant had to demonstrate 'justifiable demand' for the sought landfill capacity for a proposed putrescible waste landfill to gain development consent. The intent of the SEPP was to ensure that excess approved landfill capacity was not generated which may discourage the recovery, reuse and recycling of waste.

The then Minister for Urban Affairs and Planning sought and engaged specialist independent advice[5] on justifiable demand before determining development applications for putrescible waste landfills.

9.2 Key findings

Table 9-1 summarises the key issues.

[5] http://www.wrightstrategy.com/documents/LandfillInquiry.pdf

Table 9-1 EfW Policy review

EIS Reference	Key findings/Issues	Actions and recommendations
Section 5 and tables 5.3 and 5.4 and Figures 5.2 and 5.4.	These tables and figures are based on a range of assumptions that create uncertainty in the future eligible waste quantities under the NSW EfW Policy.	The issue of the quantity of eligible fuel is fundamental to the assessment and determination of the WSERRC. It is recommended that to assist with the determination of this project that the NSW Department of Industry, Planning and Environment consider undertaking an independent analysis to assess the potential 'eligible waste' that the WSERRC may potentially have access. This would assist to ensure that a consistent and transparent dataset is available and to inform the determination of this waste to energy project. This is to ensure as much as possible that higher priority resource recovery projects are not jeopardised (or delayed) by prematurely creating a waste to energy capacity that may outcompete them.

10. Ash

10.1 Overview

The technical report *Waste and resource management assessment report*, prepared by ARUP, 10 September 2020, has been reviewed with respect to the ash residues from the incinerator.

This technical report has been prepared to address the SEARs and includes the following:

- Some information on the expected quantities and waste classification of the three ash waste streams which would be generated by the project;
- Discussion that some of this ash may be reused, subject to gaining a resource recovery exemption under the POEO Act; and
- Any ash not subject to a resource recovery exemption would be either directly landfilled where its waste classification is general solid waste, or treated to immobilise contaminants so that its waste classification would be changed from hazardous waste to restricted waste and landfilled.

The three ash types are:

- Incinerator bottom ash (IBA) at approximately 65,000 tpa (dry) and is expected to be classified as general solid waste;
- Boiler fly ash at approximately 9,000 tpa (dry) is proposed to be combined with FGTr or IBC. This waste stream is expected to be classified as general solid waste if mixed with IBA or hazardous waste if mixed with FGTr;
- FGTr at approximately 20,000 tpa (dry) and is expected to be classified as hazardous waste.

Hazardous waste is not permitted to be landfilled in NSW unless it is treated and subject to an immobilisation approval granted by the EPA.

It is possible that not all of the ash will be able to be reused.

The FGTr is expected to be classified as hazardous waste and would need to be treated/immobilised to reclassify it as restricted solid waste. This waste stream is proposed to be disposed of in a licensed landfill facility in NSW (as hazardous waste cannot legally be landfilled in any landfills in NSW).

There is a potential inaccuracy with interpretation of the licence limits on the Cleanaway St Marys facility identified to accept and treat the FGTr to change its waste classification. The EIS states that this site has ‘no limit on annual processing capacity...’. This is unlikely to be the case as it is likely a reference to the fee based activity which sets the annual fees. The annual processing capacity is likely to be defined in the development consent which applies to the site. This may mean that the site is unable to accept and treat up to the estimated 20,000 tpa of ash to be able to reclassify the ash from hazardous to restricted waste. Should the St Marys site be unavailable it is proposed to send the FGTr to another treatment facility which is not identified in the EIS.

Table 5.11 of the EIS identifies a range of landfill sites available for the IBA, but is silent on the landfills able to be used to dispose of the FGTr. This is possibly the case because the only landfill licensed in NSW able to receive and dispose of restricted waste is owned and operated by another waste management company. This other waste management company may elect not to accept the FGTr for disposal. Furthermore, it is unclear if this site has the capacity to accept the FGTr over the life of the WSERRC project.

10.2 Key findings

Table 10-1 summarises the key issues.

Table 10-1 Ash management review

EIS Reference	Key findings/Issues	Actions and recommendations
Section 5.11 of the EIS and section 5 from Technical Report C.	It is unclear whether the facility proposed to treat the FGTr and possibly the boiler fly ash will have the capacity to treat the ash to enable it to be reclassified as restricted waste. Furthermore, no disposal facility/s are identified which could lawfully receive and dispose of the FGTr and possibly the boiler ash (conservatively assuming that these waste streams are unable to be reused).	It is recommended that the applicant provide evidence that: • its St Marys site (or other site/s) can lawfully receive and treat the ash to achieve a waste classification that enables it to be disposed to landfill; and • there is a landfill which can lawfully receive and dispose of the FGTr and possibly the boiler ash and this should be accompanied by a memorandum of understanding from the landfill operator(s) identifying it would be prepared to accept and dispose of the ash for the duration of the project.
Section 5 and tables 5.3 and 5.4 and Figures 5.2 and 5.4.	These tables and figures are based on a range of assumptions that create uncertainty in the future eligible waste quantities under the NSW EfW Policy.	The issue of the quantity of eligible fuel is fundamental to the assessment and determination of the WSERRC (and other proposed waste to energy projects). It is recommended that to assist with the determination of this project that the NSW EPA completes an assessment of the current and predicted quantities to waste that would be eligible under the NSW EfW Policy so that a consistent and clear dataset is available and to inform the determination of this (and other) waste to energy projects. This is to ensure as much as possible that higher priority resource recovery projects are not jeopardised (or delayed) by prematurely creating a waste to energy capacity that may outcompete them.

11. Conclusions and recommendations

The key findings of this review and recommendations are summarised below.

Planning

The site is located within the Western Sydney Parklands (WSP). *State Environmental Planning Policy (Western Sydney Parklands) 2009 (SEPP WSP)* is the principal environmental planning instrument controlling development and land use planning in the WSP. The site is unzoned and the proposed development is permitted with consent.

Notwithstanding the above, the provisions of Clause 17 of the SEPP WSP state that development consent must not be granted to development on private land in the WSP, unless the consent authority has considered, amongst other matters, whether the development will contribute to or impede the implementation of the aim of this Policy, and the need to carry out development on the land.

The proposed development must have regard to the Aim of the SEPP WSP as set out in Clause 2. Clause 2 includes *'The aim of the Policy is to put in place planning controls that will enable the Western Sydney Parklands Trust to develop the Western Sydney Parklands into a multi-use urban parkland for the region of Western Sydney by*', (and of particular relevance to the assessment of this development):

(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,

The EIS provides the following justification *'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.'*

However the EIS has not adequately addressed the provisions of the WSP to enable clear demonstration of the beneficial social and economic outcomes to Western Sydney of the proposed development in this location.

Having regard to the above, this also raises questions on the suitability of the site and whether the proposed development in the proposed location, within the WSP is in the public interest.

Technology and design

The lack of a concept design report and of input from a nominated technology provider means that the justification of the technology, and the details provided about how the plant would operate, are fairly high level. Determination of this proposal should probably be deferred until such information is available, and air quality and health risk assessments can be confirmed as being in alignment with the adopted equipment from the nominated technology provider.

Whilst the type of technology to be used is broadly nominated, and architectural plans of the buildings and layout plans have been provided, there is a possibility that the plant layouts may need to be modified once a technology provider is nominated and actually designs the facility. Normally the technology provider would be involved in preparing the plant design for the EIS. It is not clear who prepared this design, and their level of experience in designing such facilities.

A concept design report and drawings should have been prepared for the EIS by the nominated technology provider. An architectural design report has been prepared, and some civil design drawings are provided, but there is no concept design report about the technology itself, which is the most critical aspect of an energy from waste facility.

Determination of this proposal could possibly need to be deferred until such information is available, and air quality and health risk assessments can be confirmed as being in alignment with the adopted equipment from the nominated technology provider.

The NSW EfW Policy calls for a secondary combustion chamber to be provided where “the temperature should be raised to 1100°C for at least 2 seconds after the last injection of air” , if chlorine levels are expected to be above 1%. The EIS states that as the average chlorine content for the intended feedstock mix remains less than 1%, the design temperature of 850 degrees Celsius is appropriate.

The results of waste audits and laboratory testing of MSW and C&I waste received at the Erskine Park transfer station in 2019 are used to suggest that chlorine levels in the feedstock will not exceed 1% in any case. As no sampling and analysis methodology and information was provided in Technical Report C and Technical Report E, it is impossible to assess how representative is the data.

Given the intent to obtain sufficient waste to run the facility through winning future Council (MSW) contracts, and how close the chlorine levels (0.94 %) in MSW are close to 1%, it would seem prudent to make provision for a secondary combustion chamber in the design, in case it is required. There is no provision made in the plant design.

The EIS also states that some of the waste streams will be subject to sorting and active removal of PVC, although the extent to which this would be undertaken (some or all waste streams) is not clear. It is stated that this would involve building new facilities at either the Erskine Park transfer station (and extending it), or elsewhere. No firm commitments are made, and the feasibility of extending the existing transfer station is not discussed, but it is noted in the EIS that this would require separate approvals.

Reference plants

Despite dozens of EfW facilities being in operation around the world, only two reference facilities have been nominated (Dublin, Ireland and Filborna, Sweden). According to the EIS, they both 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.

However, Table 5.7 of the EIS only compares the waste types with the Dublin plant, not the Filborna plant. Whilst the waste types are broadly the same, no detailed comparison of waste composition (by %) between the Proposal is provided. Also there is not enough information provided about the Dublin plant to be able to verify whether the waste types are actually the same.

The EIS states that air emission data from these reference facilities shows that they perform well below both the NSW and EU emission limit values for all regulated pollutants. However long term operational monitoring data for some of these pollutants (such as fine particulate matter $PM_{2.5}$) are not provided in Table 5.10 of the EIS, for either plant. The two nominated reference plants have different technology providers.

The Dublin plant uses Hitachi Zosen Inova technology, whilst the Filborna plant uses Babcock Wilcox technology. No assurances are provided in the EIS that these technology providers or equivalently experienced providers would be used. Hence, other less reliable or proven technology providers could be utilised instead, if this facility is approved. Thus, the long term operational reliability of the proposal (combustion and air quality control equipment) is uncertain.

It is noted that there is very little information provided about the Filborna facility, and that the EIS and technical reports are mainly based on the Dublin facility. However, the information for the Dublin facility was in part obtained via a Freedom of Information request, rather than through cooperation with the operators of the Dublin facility (reference Technical Report C, section 5.2.3). Thus there is probably a lot more information that could be made available about the performance of this plant if the Dublin plant operator had been willing to provide performance data.

Air quality

Overall, the plant design has a number of technologies that address 'best practice' when it comes to flue gas cleaning after the heat exchange for the boiler system. This addresses emissions of toxic and acid gases to a Maximum Extent Achievable (MEA) – as required by the NSW EfW Policy.

The air quality assessment prepared for the EIS has focused on ensuring that the proposal can meet the impact assessment criteria for plant emissions at the upper range of the Best Available Technology (BAT) achievable emission limits (AELs). This is a conservative approach.

Theoretical emission rates, based on feedstock assumptions and performance of gas cleaning equipment, have been tested through the air dispersion modelling process. Despite significant errors being made for the meteorology input files, the calculated design ground level concentration (GLC's) are shown to be compliant with the *Approved Methods for Modelling and Assessment of Air Pollutants in New South Wales*. However they cannot be relied upon.

Since the Project design and technology selection is preliminary in nature, the Air Quality assessment results can only be viewed as indicative. Ahead of determining if the feedstock management systems will be able to achieve less than 1 % of halogenated organic material, the decision not to include a secondary chamber is premature.

Human health

Overall the technical report on human health impacts is well written, clear and concise and transparent. The document follows the required methodologies of assessing health risk from air emissions in NSW. All the key exposure pathways and risk have been identified and properly quantified. The main EIS documentation also reflects what is documented in the technical report.

The one main uncertainty is that heavy PAHs has not been included in the list of chemicals assessed. Heavy PAHs like benzo(a)pyrene are difficult to destroy, and therefore is unlikely to be 100% combusted in the process. As is found with metals, 100% capture in emission control is not possible resulting in low level releases. A technical discussion should be presented why PAHs is not included.

It should be noted that the results of the health risk assessment are reliant on the results of the air dispersion modelling. Thus any changes resulting from the review of the air quality assessment (which is only currently based on an indicative plant design with no input from specifically nominated technology provider or concept design report by an EfW specialist consultant) will have follow on impacts on the health risk assessment.

Noise

The assessment predicts minor exceedances to the operational noise criteria, however these exceedances could increase subject to review of the adopted amenity criteria. The assessment discusses the impacts and recommends they are addressed in detailed design. However the assessment does not provide information regarding details of all reasonable and feasible mitigation measures with quantification of the expected noise reduction, nor does it provide an

assessment of any residual impacts in accordance with Section 4 of the *NSW Noise Policy for Industry* (2017).

Although some technical issues have been identified and recommended actions proposed, it is our opinion that the project can be designed to achieve compliance with any imposed noise limits or conditions.

Energy from Waste Policy /Waste

Under the NSW EfW Policy a range of rules are provided on the per centage (%) of residual waste which is eligible for burning and recovering a portion of its embodied energy. The range is from 100% in cases where MSW and C&I waste have specified at source separation of recoverable waste as this is the most effective way to recover valuable materials from waste. It scales down to 50%, 40% and 25%, 10% and 5% for less source separation and subsequent recovery from mixed and source separated waste.

The EfW Policy deliberately and sensibly seeks to ensure that the recovery, reuse and recycling of waste are prioritised over energy from waste and landfilling.

The proposal does not appear to have access currently to eligible MSW or C&I waste in the quantities sought and speculates on a range of scenarios which may result in it accessing enough eligible waste to meet the incinerator's capacity. It bases its waste availability assessment on the potential future ability of Cleanaway to win municipal waste contracts and secure C&I waste, which would be highly contested by other competitors.

The modelling of speculative quantities of eligible waste is based on a range of postulations, data sources and includes unpublished data from Cleanaway. This is both subjective and impossible to independently assess. The waste study suggests incoming waste could be sourced from the Greater Sydney Region, which stretches as far as Shoalhaven City Council to Newcastle City Council areas and appears to be based on the metropolitan levy area. This seems possible, but this adds additional uncertainty about being able to obtain sufficient waste and for some locations may be in conflict with the Proximity Principle.

The EIS also assesses accessing waste from the Sydney basin, which is the more likely situation.

The EIS states Mixed Waste Organic Outputs (MWOO) as a possible source of fuel. The proposed Next Gen facility (for which SEARs have just been obtained), also nominates MWOO as a source of fuel. It is therefore unclear whether the same waste is being counted by both EfW projects.

One of the reasons for refusal of the Next Gen facility approval (of similar capacity to the WSERRC at 552,500 tpa) was that the sources of waste were not well defined, and it appeared that there was insufficient eligible waste of the nominated type to fuel the facility. It is noted that the modified Next Gen facility (for which SEARs have been granted) proposes to have a throughput of only 300,000 tpa, to address one of the reasons for refusal, that insufficient eligible waste was available.

Thus it may be appropriate for the capacity of the proposal to be reduced from the proposed 500,000 tpa capacity, to address the similar issue with waste sourcing or potentially delay its commencement until such time as sufficient eligible waste is confirmed to be secured.

The proposal seeks to relax some of the requirements of the NSW EfW Policy with respect to MSW, without the investment in additional resource recovery activities. This could have the effect of resulting in 'mass burn' disposal of MSW which is contrary to one of the overarching principles in the EfW Policy.

It is also unclear how the sought C&I waste would be confirmed to meet the eligibility criteria of 100% 'where a business has separate collection systems for all relevant waste streams' as required under the EWF Policy. The EIS suggests that one of the ways this would be independently achieved is it would be approved by the EPA. However, the generators of C&I waste in the main are not required to be licensed by the EPA.

The recovery, reuse and recycling of waste are prioritised under EfW Policy, in recognition that they can achieve superior sustainable outcomes.

A significant potential consequence of the WSERRC (if approved) is it could make it more difficult (or delay) future waste recovery, reuse and recycling projects.

Future resource recovery and recycling projects would have to compete in the market with the proposal. This situation would be compounded by the idea mentioned in the EIS to lower the criteria for eligible waste, by not having to recover valuable resources from MSW.

Resource recovery, reuse and recycling projects would have to compete with landfill operators, however the landfilled waste in Sydney and many other areas of the State (including the Greater Sydney Region) is subject to the full waste levy rate. This compares to the WSERRC which may at most be subject to about 20% of the waste levy should all the ash be landfilled.

In the late 1990s and early 2000s there was a race to obtain approval for putrescible waste landfills to accept and dispose of Sydney's putrescible waste. The government at the time introduced SEPP. 48.

This SEPP created a requirement that an applicant had to demonstrate 'justifiable demand' for the sought landfill capacity for a proposed putrescible waste landfill to gain development consent. The intent of the SEPP was to ensure that excess approved landfill capacity was not generated which may discourage the recovery, reuse and recycling of waste.

The then Minister for Urban Affairs and Planning sought and engaged specialist independent advice[6] on justifiable demand before determining development applications for putrescible waste landfills.

The NSW Department of Industry, Planning and Environment may see merit in undertaking a similar analysis to assess the potential 'eligible waste' that the WSERRC may potentially have access and to assist with the project's determination.

Ash

A concern with the proposal is the waste classification and availability of treatment and disposal facilities for the ash. It is possible that not all of the ash will be able to be reused. For example the FGTr is expected to be classified as hazardous waste and would need to be treated/immobilised to reclassify it as restricted solid waste to enable it to be disposed of in a licensed landfill facility in NSW (as hazardous waste cannot legally be landfilled in any landfills in NSW).

It is not clear from the information provided in the EIS whether the identified treatment site (or other unidentified sites) can lawfully receive and treat the FGTr ash waste to lower its waste classification to restricted solid waste nor is there a landfill operator willing to accept and dispose of this portion of the ash waste over the duration of the project. These issues should be resolved before the project is determined to provide confidence that the WSERRC can operate as proposed.

[6] http://www.wrightstrategy.com/documents/LandfillInquiry.pdf

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Appendices

Appendix A – Comparison with Next Gen facility

Comparison of Next Gen Development Application 2015 v WSERRC proposal 2020

Subject	Next Gen Development Application 2015 (subject of refusal by IPC)	WRERRC EIS Volume 1 2020 (EIS pages referenced)
Waste inputs	Fuel mix: CRW (19.90%) MRF (12.06%) Floc Waste (14.73%) Mixed C&I (40.93%) Specified Waste (12.37%) (Pg 21, Urbis 2017)	Fuel mix MSW C&I (pg i)
Waste output	Bottom ash (wet): 400,000 tpa (Pg x, Urbis 2020)	65,000 tpa (dry weight) Bottom ash 20,000 tpa of FGTr and approx 9,000 tpa of other ash. The FGTr is likely to be classified as hazardous waste(pg ii)
Waste output reuse	No reuse of ash or residue materials (Pg x, Urbis 2020)	Ferrous metal separator for ash recycling
Plant capacity (tonnes of waste disposed of)	Stage 1: 405,000 to 675,000 tpa 552,000 nominal tpa Stage 1 & 2: 1.105 million tpa Technological design capacity: 1.35 million tpa (Pg 1 Urbis 2017)	Up to 500,000 tpa (pg i)
Waste feedstock supply	Stage 1: 551,200 tonnes 582,700 tonnes (by 2019) Stage 2: 1,625,000 tonnes (Pg 24, Urbis 2017)	In the short term, the proposal's feedstock mix is expected to include 50 – 70% of C&I waste and less than 50% of MSW residual. (pg 174) Long term waste feedstock supply is expected to be up to 60% of MSW sourced from councils with a FOGO kerbside collection service. (pg 175) One scenario presented was:

Subject	Next Gen Development Application 2015 (subject of refusal by IPC)	WRERRC EIS Volume 1 2020 (EIS pages referenced)
		- 200 kt waste directly eligible for EfW through FOGO collection and waste from businesses with source separation. - 300 kt residual waste after Erskine park waste sorting.
Earthworks excavation and fill	Soil and rock excavation 323,000 m3 Fill volume: 429,600 m3 Import of fill material: 147,000 m3 (Pg 158, Urbis 2015)	Reuse of in-situ materials: 50,000 m^3 Imported fill material: 11,000 m^3 Unsuitable material removed from site: 4,000 m^3 (Pg 70)
Stack height	100 m (Pg 54, Urbis 2015)	75 m (+/- 5m) (199 m)
Building height	Max 52m (Pg 24)	Not shown
Waste delivery	Conveyor from Bingo, truck using internal road service (Pg iii, Urbis 2015)	Truck deliveries – 161 residual waste delivery trucks per day (TR K pg 22)
Incinerator	High efficiency boiler	Waste boiler system (pg 104)
Operating temperatures	Main chamber temperature of more than 850 degrees Celsius for greater than 2 secs Secondary combustion chamber maintained at temperature of more than 850 degrees Celsius	Main chamber temperature of more than 850 degrees Celsius for greater than 2 secs (pg 104) No secondary combustion chamber
Operating times	24 hrs @ 7 days for everything	8,000 hours per year (pg 196)
Flue gas cleaning	Absorption by activated carbon Addition of hydrated lime Semi dry reactor Fabric filter with recirculation	Selective non-catalytic reduction NOx removal system Adsorption by activated carbon and hydrated lime Bag house filter Wet scrubber

Subject	Next Gen Development Application 2015 (subject of refusal by IPC)	WRERRC EIS Volume 1 2020 (EIS pages referenced)
	NOX removal system (p53 – 2020 EIS)	(TR A Section 8)
Transport movement	Construction phase: 614 Vehicles per day (110 cars, 504 trucks) Operational phase Waste delivery trucks: 138 per day Ash removal trucks: 28 per day Miscellaneous trucks: 8/day (Pg 163, Urbis 2015) (Pg x, Urbis 2020)	Construction phase: 450 construction vehicles per day Operation phase: 188 waste vehicles per day 48 vehicles for employee and visitor traffic (pg 23 of TR K)
Waste handling	Stage 1: 2 bunkers serving 2 incineration lines Stage 2: 4 bunkers serving 4 incineration lines (Pg 11, Urbis 2017)	1 Bunker with a storage capacity of 12,600 t and a theoretical maximum of 17,000 t (pg 83)
Net calorific value	Operation efficiency between 10 MJ/kg to 16 MJ/kg Nominal NCV of 12.34 MJ/kg for waste volume of 552,500 tpa (Pg 113, Urbis 2015)	Operation efficiency between 7.7 MJ/kg to 14.3 MJ/kg Nominal NCV of 11 MJ/kg Pg (93)
Energy Balance	Power generation (stage 1): 79 MW electricity Power required to operate (stage 1): 9 MW Power exported to grid (stage 1): 70 MW Power generation (stage 2): 158 MW Power required to operate (stage 2): 18 MW Power exported to grid (stage 2):	Up to 58 MW 3 MW to be used to power facility Up to 55 MW to be exported Potential to export heat and steam to local industries (pg i) Net electrical efficiency: 27.8%

Subject	Next Gen Development Application 2015 (subject of refusal by IPC)	WRERRC EIS Volume 1 2020 (EIS pages referenced)
	140 MW Net electrical efficiency: ≈30% Thermal input: 469.6 MW Net thermal export: 140 MWe (Pg 30, Urbis 2015)	
Employment	Operational jobs: 55 Construction jobs: Up to 500 (Pg ix, Urbis 2020)	Operational jobs: 50 Construction jobs: Up to 900 direct 700-1200 indirect Pg (ii)
Water demand	Construction: 23,464 m3 EfW Plant operations: Total 160.8 ML/yr Water/steam cycle loss: 11.6 ML/yr FGT: 117.2 ML/yr Bottom ash: 40.6 ML/yr Staff amenities 1.43ML/yr Water reuse 17,570 m2 area of roof equating to 15.54 ML/yr for median rainfall year (Pg 43-44, Urbis 2015)	Construction: 22,500 m3 Operation: Average potable water demand 9.46 ML/yr Process water 284 ML All process water would be reused within the facility, with the only loss as steam or quenching the incinerator bottom ash. Pg(469)
Net positive Greenhouse Gas effect	1.5 million tonnes CO2-e (assumed per year)	390,000 tpa CO2-e removed (pg xxxi)

Subject	Next Gen Development Application 2015 (subject of refusal by IPC)	WRERRC EIS Volume 1 2020 (EIS pages referenced)
	30 year operation = 45 million tonnes CO2-e/year 2.99 million CO2 (assumed per year) (Pg iv & vii, Urbis 2015) (Pg x, Urbis 2020)	
Subdivision	Re- Subdivision of Lots 1, 2, 3 into 11 lots (Pg 19, Urbis 2020)	Two sub divisions: 2.04 ha northern section 6.19 ha southern section Infrastructure only on southern portion (pg vi)
Waste and ash	APC residue ash will be collected, stored then transported via sealed tanker off-site for further treatment and disposal. (Pg v, Urbis 2015)	Building demolition waste and contaminated soil will generate the largest amount of waste from the construction phase. IBA to be transported offsite to processing facility (separate DA process). This is only one option and does not reflect all the options proposed in Technical Report C. The other ash will be managed offsite using existing infrastructure, however, see comments in Section 10 of this report for more clarification on this. (pg xxv, 375)
Biodiversity	Removal of 0.27 ha of Cumberland Plain Woodland 2.89 ha of River Flat Eucalypt Forest 22.5 ha of couch grass 8 habitat trees lost Replant 0.54 ha of Cumberland Plain Woodland Replant 4.98 ha of River Flat Eucalypt Forest (Pg vi, Urbis 2015)	Removal of 0.45 ha of Cumberland Plain Woodland. Site landscaping and restoration of cleared native vegetation is proposed following construction Proposed realignment of the overland
Reference Plants	TREDI, France	Dublin Waste to Energy

Subject	Next Gen Development Application 2015 (subject of refusal by IPC)	WRERRC EIS Volume 1 2020 (EIS pages referenced)
	KEBAG, Switzerland VFA, Switzerland STADTWERKE ERFURT, Germany EEW, Germany	Filborna Waste to Energy, Sweden

Appendix B – Emission comparison table for energy from waste facilities

Emission comparison table for energy from waste facilities

Pollutant (all values stated in micro grams per cubic metre)	Cleanaway Western Sydney Energy & Resource Recovery Centre Modelled expected stack emission concentrations (24-hour average)	The Next Generation Eastern Creek RTS Updated report	The Next Generation Eastern Creek Amended EIS	The Next Generation Eastern Creek Initial EIS	Dublin Reference plant Technical Report A (Emissions Limit / maximum recorded value)	Swedish reference plant WSERRC EIS (2018 annual mean emissions)	Industrial Emissions Directive (IED) (2010/75/EU) (Daily Average)	POEO Clean Air Regulation Schedule 3 (Group 6) (One hour averaging period)
Solid particles /Dust/ Particulate Matter (mg/m^3)	<5 (dust) < 4.8 ($PM_{2.5}$) < 4.9 (PM_{10})	1	1	22	30 /1.25	0.2	10	50
Nitrogen dioxide NO_2 (mg/m^3)	< 120 (NOx calculated as NO_2)	120	188	286	400 /208.5	72	200	500
TOC (mg/m^3)	< 10 (VOC)	0.015	0.015	14	20 / 1.35	0.6	10	40 (as VOC)
Dioxins and furans (ng/m^3)	< 0.06 (dioxins)	0.01	0.01	0.01	0.1 / 0.03	0.0018	No applicable standard	0.1

Pollutant (all values stated in micro grams per cubic metre)	Cleanaway Western Sydney Energy & Resource Recovery Centre Modelled expected stack emission concentrations (24-hour average)	The Next Generation Eastern Creek RTS Updated report	The Next Generation Eastern Creek Amended EIS	The Next Generation Eastern Creek Initial EIS	Dublin Reference plant Technical Report A (Emissions Limit / maximum recorded value)	Swedish reference plant WSERRC EIS (2018 annual mean emissions)	Industrial Emissions Directive (IED) (2010/75/EU) (Daily Average)	POEO Clean Air Regulation Schedule 3 (Group 6) (One hour averaging period)
Hydrogen Chloride HCL (mg/m^3)	< 6	9	9	43	60 / 0.04	0.0	10	No applicable standard
Cadmium Cd (mg/m^3)	-	0.009	0.009	0.04	0.05 /0.001	Not available	No applicable standard	0.2
Mercury Hg (mg/m^3)	< 0.02	0.004	0.004	0.04	0.05 / 0.007	0.0002	No applicable standard	0.2
Sulphur Dioxide SO_2 (mg/m^3)	< 30 (SO^2 + SO^3)	27	27	143	200 /24.6	4.1	50	No applicable standard
Hydrogen Fluoride HF (mg/m^3)	< 1	0.5	4	3	4 / 0.5	0.005	1	No applicable standard
Carbon Monoxide CO (mg/m^3)	< 10 TOC (VOC)	23	23	71	100 / 15.0	2.7	50	125

Pollutant (all values stated in micro grams per cubic metre)	Cleanaway Western Sydney Energy & Resource Recovery Centre Modelled expected stack emission concentrations (24-hour average)	The Next Generation Eastern Creek RTS Updated report	The Next Generation Eastern Creek Amended EIS	The Next Generation Eastern Creek Initial EIS	Dublin Reference plant Technical Report A (Emissions Limit / maximum recorded value)	Swedish reference plant WSERRC EIS (2018 annual mean emissions)	Industrial Emissions Directive (IED) (2010/75/EU) (Daily Average)	POEO Clean Air Regulation Schedule 3 (Group 6) (One hour averaging period)
	(CO is a surrogate for VOC, and is thus not modelled)							

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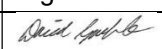
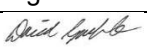
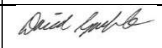
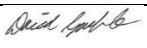
Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
0	S Mason Jones, B Cook, E Friebel, A Dixon, E Milton	D Gamble		David Gamble		12/11/20
1	S Mason Jones, B Cook, E Friebel, A Dixon, E Milton	D Gamble		David Gamble		13/11/20

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