



**Environmental
Protection
Authority**

**Kwinana Waste to Energy Project
– inquiry under section 46 of the
Environmental Protection Act 1986
to amend Ministerial Statement 1016**

Kwinana WTE Project Co Pty Ltd

Report 1718
October 2021

Inquiry under section 46 of the *Environmental Protection Act 1986*

The Minister for Environment has requested that the Environmental Protection Authority (EPA) inquire into and report on the matter of changing implementation condition 7 (Ash Characterisation and Reuse) of Ministerial Statement 1016 relating to the Kwinana Waste to Energy Project.

Section 46(6) of the *Environmental Protection Act 1986* requires the EPA to prepare a report that includes:

- (a) a recommendation on whether or not the implementation conditions to which the inquiry relates, or any of them, should be changed
- (b) any other recommendations that it thinks appropriate.

The following is the EPA's report to the Minister pursuant to s. 46(6) of the *Environmental Protection Act 1986*.

The proponent, Kwinana WTE Project Co Pty Ltd, has also submitted a request to the EPA to change the Kwinana Waste to Energy Project proposal described in Ministerial Statement 1016. This report includes the EPA's advice to the Minister following consideration of the request to change the element description of 'waste receival volume' to 'waste processing volume', increase the approved waste processing allowance from 400,000 tonnes per annum (tpa) as per Schedule 1 in Statement 1016 to 460,000 tpa and remove reference to the on-site brick making facility.

The EPA considered the request for a change to the proposal and the request for a change to the condition in a combined report because the requested changes are interlinked.



Prof. Mathew Tonts
Chair
Environmental Protection Authority

21 October 2021

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1 Proposal

The Kwinana Waste to Energy Project (the proposal) is for the construction and operation of a 400,000 tonnes per annum (tpa) waste to energy plant and brick making facility on Lot 9501 Leath Road, Kwinana Beach, Western Australia. The proponent for the proposal is Kwinana WTE Project Co Pty Ltd.

The Environmental Protection Authority (EPA) assessed the proposal at the level of Public Environmental Review and published its report in February 2015 (Report 1538, EPA 2015). In this report, the EPA considered the following key environmental factors were relevant to the proposal:

- Air quality
- Ash reuse.

In applying the *Statement of Environmental Principles, Factors and Objectives* (EPA 2020b) these factors are now represented by:

- Air quality.

The EPA concluded in Report 1538, that the proposal is environmentally acceptable and recommended that the proposal may be implemented subject to the recommended conditions.

The then Minister for Environment approved the proposal for implementation, subject to the implementation conditions of Ministerial Statement (MS) 1016 on 3 September 2015.

Previously approved changes to the proposal or condition

There have been three previous changes to the proposal or to the implementation conditions since MS 1016 was issued as follows:

- A change to the proposal under s. 45C of the *Environmental Protection Act 1986* (EP Act) to amend the waste types permitted to be processed to include commercial and industrial waste, and pre-sorted construction and demolition waste, was approved on 31 January 2017.
- A second change to proposal under s. 45C to remove the reference to the grate technology provider, update the lot number of the proposal, and provide a definition for 'proven grate combustion technology' was approved on 3 August 2017.
- A change to the implementation conditions was approved through Ministerial Statement 1093 on 5 March 2019 relating to waste acceptance monitoring and management, and the ability to accept genuine residual waste only at the facility.

2 Requested changes to the proposal

On 10 September 2019, the proponent requested the following changes to the proposal:

- change the element description of ‘waste receival volume’ to ‘waste processing volume’
- increase the waste processing volume allowance from 400,000 tpa to 460,000 tpa
- remove reference to the on-site brick making facility.

The proponent has requested to clarify the wording of the element of ‘waste receival volume’ to ensure it is clear that it is referring to the volume of waste to be processed at the facility.

The proponent proposes to mainly target lower calorific value (CV) residual waste, meaning larger volumes can be processed for the same outputs (energy and emissions).

The original proposal included a design that incorporated a brick making facility located on the site for recovery of ash produced in combustion to make by-products such as bricks, pavers and/or construction aggregate. However, since the proposal was assessed, there has been significant advancement in the availability and support for ash reuse technology and greater understanding of the ash characteristics that can be expected at the Kwinana waste to energy facility. In addition, advancements in Government of Western Australia policy and waste reuse initiatives are assisting in the development of viable markets for treated incinerator bottom ash in Western Australia. These factors, and changes to the site layout requirements, have resulted in the preference to use an off-site third party operated reuse facility for the production of aggregate from the incinerator bottom ash generated at the waste to energy facility.

Section 45C of the EP Act provides that the Minister may consent to changes to a proposal after a statement has been issued under s. 45(5) of the Act, provided the Minister does not consider that the change might have a significant detrimental effect on the environment in addition to, or different from, the effect of the original proposal.

Section 5.3 of the *Environmental Impact Assessment (Part IV Divisions 1 and 2) Procedures Manual* (EPA 2020a) identifies the EPA’s process for undertaking an assessment of a change to proposal; in particular, the ‘six aspects’ to be considered when determining whether a change to a proposal can be approved under s. 45C of the EP Act.

2.1 The six aspects to be considered

1) Identification of the content of the original proposal

The proposal is located within the Kwinana Industrial Area approximately 40 kilometres (km) south of Perth, Western Australia. The original proposal was for the

construction and operation of a waste to energy facility, with the capacity to process up to 400,000 tpa of municipal solid waste to produce electricity. The proposal included a waste receival area, a waste to energy processing facility, a brick making facility, control room, laboratory, administration offices, roads and a carpark.

As part of the waste to energy process, the incinerator bottom ash and Air Pollution Control residue (APCr) were proposed to be segregated and characterised to maximise recovery opportunities, which would include conversion into bricks and pavers and/or use of the bottom ash as a construction aggregate. In the event of a market failure for some or all of the by-products available for sale, the residual process waste would be characterised, subjected to leach testing and then disposed of to an appropriately licensed landfill.

2) Identification of the content of the relevant change(s) and determine whether the change(s) involves a revision of the original proposal

The proponent is proposing the following amendments:

- Change the element of ‘waste receival volume’ to ‘waste processing volume’.
- Increase the waste processing volume from 400,000 tpa to 460,000 tpa (60,000 tpa increase). The waste processing volume is described in Table 2, Attachment 2 of MS 1016.
- Remove reference to the on-site brick making facility (Tables 1, 2 and 3 Attachment 2 of MS 1016).

The proponent has proposed the changes as the plant is expected to process lower calorific value (CV) residual waste due to the requirement to meet condition 8 of MS 1093 which requires the plant to have the ability to accept genuine residual waste only. As a result, larger volumes of waste can be processed to achieve the same outputs (energy and emissions) as the original proposal.

The proponent has also requested to change the wording of the element of ‘waste receival volume’ to clarify that it is referring to the volume of waste to be processed at the facility.

The proponent no longer plans to have an on-site brick making facility for treatment and processing of the residues as originally proposed and approved under MS 1016; instead, residues are proposed to be managed off-site via a third-party facility.

The proponent has not requested changes to the development envelope and disturbance footprint.

The changes are sufficiently connected to or related to the original proposal and as such, is a revision of the original proposal and capable of being approved under s. 45C of the EP Act.

3) Determination as to whether the original proposal has had or will have any detrimental effect on the environment and, if so, what

In its original assessment (Report 1538, EPA 2015), the EPA considered potential impacts from the proposal activities on air quality and ash reuse. The EPA’s

assessment concluded that the EPA's objectives would be met provided there is satisfactory implementation by the proponent of the recommended conditions.

Air quality

Air quality was considered a key environmental factor in the EPA's original assessment. The combustion of waste has the potential to emit contaminants into the atmosphere via the flue gas stack and impact on air quality, which may affect human health. Emissions of contaminants that may be generated into the atmosphere during the waste to energy process include oxides of nitrogen and sulfur, carbon monoxide, metals and air toxicants, particulate matter and dioxins.

Air quality modelling predicted that the ground level concentrations (GLCs) of emissions would meet the appropriate criteria at sensitive receptors (the closest is the Naval Base Hotel, 2 km from the site), as well as the European Union Waste Incineration Directive 2000/76/EC (WID) consistent with the principles and recommendations in the section 16(e) strategic advice for the *Environmental and health performance of waste to energy technologies* (EPA and Waste Authority 2013). The proponent would also use Best Available Air Pollution Control Technologies including an Air Pollution Control system to minimise the discharge of pollutants to the atmosphere.

The EPA concluded in Report 1538 that the EPA's objective for air quality can be met provided that the facility meets or performs better than the WID or its updates at commissioning and throughout its operational life.

Ash reuse

The solid residues produced by the waste to energy facility that require management include incinerator bottom ash, boiler ash and flue gas treatment residues. The combined boiler ash and flue gas treatment residues are referred to collectively as air pollution control residue (APCr).

The proposal incorporated a brick making facility for the treatment and processing of incinerator bottom ash and APCr to produce brick products. The by-products are collected from the ash dischargers, boiler and air pollution control system.

Inappropriate handling and reuse of ash could potentially impact on inland waters through leachate or impact on human health through air exposure.

As the proponent had not demonstrated that the reuse of ash for brick products could reliably meet health, environmental safety and integrity requirements during the assessment of the original proposal, condition 7 of MS 1016 was imposed which required that the proponent demonstrate the suitability of ash for reuse, or otherwise reprocess the by-products or dispose of the by-products to an appropriate class landfill.

MS 1016 was published on 3 September 2015 and MS 1093 was published on 5 March 2019.

While construction activities at the proposal site have begun, the facility has not yet

commenced operations. The EPA therefore considers that the detrimental effects on the environment of the original proposal remain the same as those that were identified through the assessment process.

4) Determination as to whether the change(s) to the original proposal might have any detrimental effect on the environment and, if so, what

In considering whether the changes to the proposal may have a detrimental effect on the environment, the EPA has had regard for the factor objectives and principles of the EP Act, to the extent relevant to the matters being considered. The following assessment has been conducted in accordance with the current *Statement of Environmental Principles, Factors and Objectives* (EPA 2020b).

Waste receipt volume

EPA Report 1538 provided the outcome and recommendations of the EPA's assessment of the original referred proposal, based on a plant capacity of processing up to 400,000 tpa of waste to produce electricity.

Table 2 of Attachment 1 in MS 1016 describes that the proposal would include a 'waste receipt volume' of up to 400,000 tpa. The proponent has requested to change the element description from 'waste receipt volume' to 'waste processing volume'.

The original referral form stated that the proposal is for a waste to energy facility to process up to 400,000 tpa of municipal solid waste to produce electricity. The Environmental Review Document (Phoenix Energy 2014) described that up to 400,000 tpa of waste would be received for combustion. The EPA considers that the intent of the description 'waste receipt volume', was intended to mean the 'waste processed'.

The EPA considers that the proposed change to the description would not change the nature of the proposal, rather it would clarify that it is waste received for processing at the plant. Therefore, there would not be any detrimental effect on the environment as there is no change to the physical or operational elements of the proposal.

Air quality

The proponent commissioned an Air Dispersion Modelling Assessment (Ramboll Australia Pty Ltd 2019) to predict any change in impacts from the 60,000 tpa increase to waste to be processed at the facility. The assessment included a comparison of the compounds predicted in the original assessment and the proposed change, using both emissions derived data from a reference plant and emission limit values from the European Union Industrial Emissions Directive 2010/75/EU (IED) (which supersedes the WID) to predict the worst-case emissions. Both emissions sets utilised predicted that emissions from the facility would meet the relevant criteria at sensitive receptors.

Nitrogen dioxide (NO₂) is one of the key emissions produced during processing, and predictions showed that the highest 1-hour average NO₂ ground level concentrations

(GLC) for the proposed increase would be 25% of the criteria. This is a minor increase from the original assessment, which predicted 21% of the criteria.

The maximum heavy metal GLC predicted for the proposed increase is for the annual average of chromium VI, which represent 57% of the relevant criteria. However, the original assessment conservatively assumed total chromium to be 100% of chromium VI and predicted it would meet 91% of the relevant criteria. Stack testing data for comparable facilities has indicated that 48% of total chromium is present in chromium VI, which has resulted in more accurate predictions.

The DWER has advised that the air quality impact assessment is fit for purpose, and that the emission rates used are conservative.

Ash reuse

The proposed change results in ash residues being treated for reuse or disposal at approved off-site facilities operated by a third-party as opposed to an on-site brick making facility as per the original proposal. The change is due to a change in site layout resulting in a lack of space at the proposal site. The proponent would still be required to manage ash residues and ensure that representative samples from the residue streams would be tested before determining its suitability for reuse or disposal to an appropriately licenced landfill.

As part of the s. 45C application, the proponent has developed an *Ash Management Plan* which includes the *Ash Characterisation Survey Plan*. The plan was developed in line with the *State's Waste Avoidance Recovery and Reuse Strategy*, and details how the proponent proposes to manage residues produced at the waste to energy facility including the on-site storage, conditioning, handling and characterisation of ash residues for off-site treatment, reuse and/or disposal at suitably licensed facilities.

The increase in throughput will result in an additional 3,000 tpa of APCr and 12,000 tpa incinerator bottom ash. The management of ash residues in accordance with the proposed change will see 80% of residues (incinerator bottom ash) being recovered at a licensed offsite recovery premises (Blue Phoenix, Works Approval No W6510/2/21/1) and 20% of the ash residue (APCr) being transported to licensed landfill facilities for treatment via cement stabilisation and disposal to approved landfills in Western Australia. The treatment and disposal of the APCr to landfill is an interim measure pending the development of suitable markets for re-use products and the demonstration of the carbonation treatment process in Western Australia.

The proposed change will require the transport of ash residues from the Avertas facility to licensed waste management facilities. Raw APCr is likely to be classified as a hazardous substance and/or dangerous goods due to its high pH or alkalinity, presence of heavy metals and presence of dioxins and furans. The transport of dangerous goods is regulated by the Chief Dangerous Goods Officer under the *Dangerous Goods Safety Act 2004*, therefore will not require assessment by the EPA.

The EPA considers that the detrimental effect on the environment may increase from the original proposal on ash reuse due to the increase in ash.

General residual waste

Part of the original assessment also determined the materials considered acceptable for processing, as well as materials excluded from processing. The EPA concluded that its environmental objective could be met for the proposal subject to conditions requiring:

- waste acceptance criteria, to ensure that all waste received is recorded, categorised and processed appropriately to demonstrate compliance with waste types that are permitted to be processed at the facility.

These conditions were published in MS 1016 on 3 September 2015.

On 14 November 2017, the Minister for Environment asked the EPA to inquire into, and report on, the adequacy of operating conditions placed on approved Waste to Energy (WTE) facilities. The inquiry's purpose was to investigate the types of waste to be used by approved WTE proposals, ensuring that waste feedstocks at these facilities were restricted to 'residual waste' in accordance with the *Waste Avoidance and Resource Recovery Act 2007* (WARR Act). At the time of the request, a clear and consistent definition of 'residual waste' did not exist. A key aspect of the inquiry was to define 'residual waste' in accordance with the waste hierarchy under section 5 of the WARR Act, for the purposes of WTE proposals.

The outcome of the inquiry was a change to the implementation conditions of MS 1016, through a new Ministerial Statement (MS 1093) on 5 March 2019 relating to waste acceptance monitoring and management, and the ability to accept genuine residual waste only at the facility. During the assessment of this change to the proposal, DWER raised several items for consideration:

- the rationale for increasing facility throughput has not been made on calorific value grounds
- the additional 60,000 tonnes of genuine 'residual waste' further reduces the opportunity to replace existing 'non-residual' tonnages as the supply of residual waste in the metropolitan area is limited.

The EPA did consider these items and has addressed them in later sections.

While construction activities at the proposal site have begun, the facility has not yet commenced operations. The EPA therefore considers that the detrimental effects on the environment of the original proposal remain the same as those that were identified through the assessment process.

5) Determination as to whether the detrimental effect (if any) which the change(s) might have on the environment is additional to, or different from, the detrimental effect (if any) which the original proposal has had or will have

In considering the detrimental effect which the changes might have on the environment is additional to or different from, the detrimental effect of the original proposal, the EPA has had regard to the nature and extent of the proposed changes relative to the detrimental effect of the original proposal on the key environmental factors.

Air quality

The EPA notes in its original assessment that the proposal is for a 400,000 tpa waste to energy facility and predicted emissions met the relevant air quality standards and guidelines. The EPA concluded that its environmental objectives for air quality could be met.

The second proposed change to increase the volume of waste processed (increase of 60,000 tpa) is for a change in magnitude, however the emissions are not expected to change in magnitude, or to change significantly from the original proposal and assessment. The EPA notes that the increase to waste volume for processing would change outputs in terms of energy generation and emissions are similar to the original.

The EPA considers that any detrimental effect the change will have on the environment will be a minor additional detrimental effect.

Ash reuse

The increase in throughput represents an additional 3,000 tpa of APCr and 12,000 tpa incinerator bottom ash. The proponent is proposing to use a third-party off-site facility for appropriate treatment, reuse and disposal of the ash instead of constructing and utilising an on-site brick making facility. This is based on the change in site layout resulting in lack of space at the facility.

There would be no change to the way that ash would be managed at the site. Ash would still require further testing before determining its suitability for reuse or disposal to an appropriate class landfill. The proponent has developed an Ash Management Plan which details the management procedure for residue characterisation that includes sampling and analysis plans for the characterisation of residues prior to offsite treatment, re-use or disposal.

The EPA considers that any detrimental effect the change will have on the environment will be additional to the original proposal as there will be a small increase in the amount of ash produced due to increase in throughput.

General residual waste

The proponent has committed to the sourcing of the additional 60,000 tpa from residual waste as defined in MS 1093 and the Waste Strategy, specifically:

- Waste that remains after the application of a better practice source separation process and recycling systems, consistent with the waste hierarchy as described in section 5 of the *Waste Avoidance and Resource Recovery Act 2007* (WARR Act), and the Waste Strategy approved or revised from time to time under the WARR Act.
- Municipal Solid Wastes from local government areas that have implemented three bin FOGO systems that comply with the WA Waste Authority's Better Practice FOGO Kerbside Collection Guidelines.
- Commercial and industrial wastes that are subject to waste recovery where up to 30% is residual waste and therefore 'available' for energy recovery.

- Pre-sorted construction and demolition wastes that are subject to waste recovery where up to 25% is residual waste and therefore 'available' for energy recovery.

The proponent must still meet the requirements on condition 6 (Waste Acceptance Monitoring and Management) and condition 8 (Residual Waste) of MS 1093. A summary of these requirements is described below:

- Development of a Waste Acceptance Monitoring and Management Plan prior to commissioning, demonstrating the monitoring methodology to identify the supplier of each waste load, record all loads and quantities, describe the types of residual waste accepted on-site, record waste types disposed off-site. Demonstrate compliance by reporting every six months.
- Development of a Waste Acceptance System Plan prior to commissioning and annually thereafter that includes:
 - a description of the waste types that the facility could accept, if it only operated on residual waste
 - a description of the source separation processes, as provided by the generator of the waste, for the waste streams that are accepted at the facility
 - details of, and justification for, the procedures and measures that the proponent has implemented to achieve the objectives specified in condition 8-1 of MS 1093
 - a detailed description of the learnings from the previous year(s) on how the objective specified in condition 8-1 of MS 1093 and the Waste Acceptance System Plan can be better achieved and/or improved
 - demonstrate compliance with condition 8-1 of MS 1093 by annually undertaking an independent review of the Waste Acceptance System Plan and reporting it to the CEO in the Compliance Assessment Plan required by condition 4-1.

The proponent has provided a supplementary calorific analysis undertaken for the relevant six catchment councils over a year. The analysis demonstrated that estimated calorific value varied throughout the year and on average was lower than 10.1 megajoules per kilogram estimated in the original assessment. It should also be noted that the energy production would not increase and is calorific value dependent.

The EPA notes that DWER is currently undertaking a number of programs to improve waste separation with local government authorities and the proponent is unable to regulate the waste providers separation techniques. The EPA considers the increase in throughput reflects an additional 60,000 tpa of waste that is diverted from landfill, therefore given the waste to energy facility sits higher in the mitigation hierarchy for waste reduction and ash would be reused, it is an improvement on landfilling. The EPA notes that the proponent will need to show continuous improvement in accordance with its current Ministerial Statement and this can be regulated by DWER.

The EPA considers that any detrimental effect the change will have on the environment will be a minor additional detrimental effect.

6) Determination as to whether any detrimental effect which the change(s) to the original proposal might have on the environment, which is additional to, or different from, any detrimental effect which the original proposal has had or will have is, in the circumstances, significant

In considering whether the detrimental effect which the change to the original proposal might have on the environment, which is additional to, or different from, any detrimental effect which the original proposal has had or will have is, in the circumstances, significant, the EPA has had regard to the following:

Air quality

The EPA considers that although the increased volumes of waste to be processed will increase the air emissions, there is no reasonable possibility that the detrimental effects on the environment of the change to the proposal identified in Aspect 4 above will be significant as:

- The EPA and Waste Authority's strategic advice states that 'Proposals must demonstrate best practice that, at a minimum, meets the European Union's WID standards (now replaced by the IED) for emissions at all times'. The modelling predicts that although there is a slight increase in pollutant emissions, all emissions are well within the relevant criteria and would meet the IED standards.
- Works Approval W5911/2016/1 includes the requirement to verify emissions through monitoring during the commissioning period, which addresses comments from the Department of Health.
- Air emissions, including monitoring and reporting requirements during both construction and operations, can be regulated by the DWER under Part V of the EP Act.
- Advice from DWER that the originally assessed risk based on maximum possible emissions would not alter as a result of the minor change to emissions.

Ash reuse

While the increased volumes of waste processed may cause an increase to the volume of waste generated, there is no proposed change to how the ash will be dealt with. The proponent will need to comply with condition 7 of MS 1016 to demonstrate that ash produced from the plant is suitable for reuse, or alternatively disposal to a suitably classed landfill. The EPA considers that there would not be any significant change to the detrimental effect from the original proposal.

General residual waste

The proponent has committed to the sourcing of the additional 60,000 tpa from residual waste as defined in MS 1093 and the Waste Strategy. The proponent has also committed to the transition from non-residual to residual waste and the obligations for continuous improvement to support the State's Waste Avoidance and Resource Recovery Strategy 2030.

For these reasons, the EPA considers that there is no reasonable possibility that the proposed changes to the proposal will have a significant detrimental effect on the environment in addition to, or different from, the effect of the original proposal.

2.2 Recommendations

Having assessed the proposed change to the proposal, the EPA submits the following recommendations to the Minister for Environment:

1. the EPA considers there is no reasonable possibility that the proposed changes will have a significant detrimental effect on the environment that is additional to, or different from, the effect of the original proposal.
2. The Minister may approve the changes to the proposal under s.45C of the EP Act by signing Attachment 3 to MS 1016 in Appendix A.

3 Requested changes to the conditions

The proponent has requested the following change to the implementation conditions of MS 1016:

- amend condition 7 (Ash Characterisation and Reuse) to reflect the removal of the brick making facility from the proposal.

In May 2021, the Minister for Environment requested that the EPA inquire into and report on the matter of changing the implementation condition 7 (Ash Characterisation and Reuse) of MS 1016 for the Kwinana Waste to Energy Project. This report satisfies the requirements of the EPA's inquiry.

3.1 Inquiry into changing the conditions

The EPA has discretion as to how it conducts this inquiry. In determining the extent and nature of this inquiry, the EPA had regard to information such as:

- the currency of its original assessment (Report 1538, EPA 2015)
- MS 1016 and MS 1093
- information provided by the proponent (Kwinana WTE Project Co Pty Ltd 2020)
- advice from relevant decision-making authorities
- any new information regarding the potential impacts of the proposal on the environment.

EPA procedures

The EPA followed the procedures in the *Environmental Impact Assessment (Part IV Divisions 1 and 2) Administrative Procedures 2016* (State of Western Australia 2016) and the *Environmental Impact Assessment (Part IV Divisions 1 and 2) Procedures Manual* (EPA 2020a).

3.2 Inquiry findings

The EPA considered that air quality is the key environmental factor relevant to the change to the conditions.

Air quality

The EPA's environmental objective for air quality is *to maintain air quality and minimise emissions so that environmental values are protected*.

Conclusions from EPA Report 1538

The EPA noted that the proposal may impact on air quality via the combustion of waste and has the potential to emit contaminants into the atmosphere through the flue gas stack. Emission of contaminants that may be generated into the atmosphere during the waste to energy process include oxides of nitrogen and sulfur, carbon monoxide, metals and air toxicants, particulate matter and dioxins.

The EPA concluded that the environmental objective could be met for the proposal subject to the following conditions:

- Schedule 1 specifying that emissions shall not exceed the emissions limits specified in Annex V of the WID or its updates.
- Schedule 1 specifying the waste types permitted to be processed and waste types not permitted to be processed.
- Condition 6 'Waste Acceptance Monitoring and Management Plan', to ensure that all waste received is recorded, categorised and processed appropriately to demonstrate compliance with waste types that are permitted to be processed at the facility.
- Condition 7 'Ash Characterisation and Reuse', to ensure that the reuse of ash for brick products can reliably meet health, environmental safety and integrity requirements.

Assessment of the requested change to conditions

The EPA considers that the following current environmental policy and guidance is relevant to its assessment of the proposal for this factor:

- *Environmental Factor Guideline – Air Quality* (EPA 2020c).

The proponent is seeking a change to condition 7 (Ash Characterisation and Reuse) of MS 1016. The change is due to the proposed removal of the brick making facility from the proposal. The intent of condition 7 is to demonstrate that the ash produced by the plant was suitable for recovery to make by-products, bricks and pavers, and/or construction aggregate, and that the by-products were fit for use. The condition requires that prior to commissioning of the brick making facility, an Ash Characterisation Survey Plan and Ash Reuse Management Plan would be prepared and submitted to the CEO.

The proponent has submitted a revised *Avertas Energy Waste to Energy Plant Kwinana - Ash Management Plan* (Ramboll Australia Pty Ltd 2020a) and *Avertas Energy Waste to Energy Project Kwinana - Ash Characterisation Survey Plan* (Ramboll Australia Pty Ltd 2020b) to the EPA to align with the proposed changes to conditions.

Due to the requested change to the proposal to remove the on-site brick making facility described in section 2 of this report, the EPA considers it appropriate to review and amend condition 7 (Ash Characterisation and Reuse) of Ministerial Statement 1016 to align with this.

Having regard to the proposed change to the proposal and other relevant information, the EPA has recommended that condition 7 (Ash Characterisation and Reuse) is amended as set out in Appendix B.

3.3 Conclusions and recommendations

Change to condition 7

The proponent has requested changes to condition 7 (Ash Characterisation and Reuse) of MS 1016 for the following reasons:

- the proposed amendment is due to the removal of the on-site brick making and aggregate facility to using off-site third party operated re-use, treatment and disposal facilities approved for such purposes.

The original intent of condition 7 was to demonstrate that the ash produced by the plant was suitable for recovery to make by-products, bricks and pavers, and/or construction aggregate on-site. The condition required that prior to commissioning of the brick making facility, an *Ash Characterisation Survey Plan* and *Ash Reuse Management Plan* would be prepared and submitted to the CEO.

As the proponent no longer plans to construct or utilise an on-site brick making facility, the EPA considers it appropriate to change condition 7.

Conclusions

In relation to the environmental factors, and considering the information provided by the proponent and relevant EPA policies and guidelines, the EPA concludes that:

- In light of the changes to the proposal recommended for approval under s. 45C of the EP Act to remove the brick making facility, condition 7 of MS 1016 would need to be amended so that it is relevant and appropriate (Appendix B).
- No new significant environmental factors have arisen since the EPA's original assessment of the proposal.
- Impacts to the key environmental factors are considered manageable, based on the requirements of the original conditions retained in MS 1016, and the imposition of the attached recommended condition (Appendix B).

Recommendations

Having inquired into this matter, the EPA submits the following recommendations to the Minister for Environment under s. 46 of the EP Act:

1. While retaining the environmental requirements of the original conditions of MS 1016, it is appropriate to update implementation condition 7.
2. After complying with s. 46(8) of the EP Act, the Minister may issue a statement of decision to change condition 7 of MS 1016 in the manner provided for in the attached recommended statement (Appendix B).

4 Other advice

Since the commencement of this inquiry, the EPA has released a guideline on greenhouse gas emissions (EPA 2020d). The proposal estimated scope 1 emissions of 110,574 tonnes CO₂-e per year.

Greenhouse gas emissions were not included in the original assessment of the proposal (Report 1538, EPA 2015), and the initiation letter for this inquiry from the Minister did not include reference to greenhouse gas emissions.

As such, greenhouse gas emissions were not considered in this inquiry. However, the Minister may choose to request an additional s. 46 inquiry into whether implementation conditions for MS 1016 should be changed as a result of greenhouse gas emissions.

Appendix A: Recommended Attachment 3 to Ministerial Statement 1016

Attachment 3 to Ministerial Statement 1016

Change to proposal approved under section 45C of the *Environmental Protection Act 1986*

This Attachment replaces Attachment 2 of Ministerial Statement 1016

Proposal: Kwinana Waste to Energy Project

Proponent: Kwinana WTE Project Co Pty Ltd

Changes:

- Change the element description of ‘waste receival volume’ to ‘waste processing volume’.
- Increase the waste processing volume allowance from 400,000 tpa to 460,000 tpa.
- Remove reference to the on-site brick making facility.

Table 1: Summary of the proposal

Proposal title	Kwinana Waste to Energy Project
Short description	<p>This proposal is for a waste to energy plant using Proven Grate Combustion Technology and brick making plant and associated infrastructure, on Lot 9501 Leath Road, Kwinana, which includes the following:</p> <ul style="list-style-type: none"> • waste receiving area • two fully automated furnaces or lines • steam system with electricity generation • flue gas cleaning air pollution control system (one per line) • two lines, two flues (one per line) and one gas stack • a brick making facility • a control room • laboratory • associated infrastructure.

Table 2: Location and authorised extent of physical and operational elements

Element	Location	Previously Authorised Extent	Authorised Extent
Waste to energy plant and brick making facility	Figure 2 and co-ordinates in this schedule	Clearing of no more than 1 hectare within the development envelope	Clearing of no more than 1 hectare within the development envelope
Waste receipt processing volume		Up to 400,000 tonnes per annum	Up to 460,000 tonnes per annum
Emissions output		Shall not exceed the emissions limits specified in Annex V of the European Union Waste Incineration Directive 2000/76 or its updates	Shall not exceed the emissions limits specified in Annex V of the European Union Waste Incineration Directive 2000/76 or its updates.
Waste types permitted to be processed		<ul style="list-style-type: none"> • householder source separated residual MSW; • material recovery facility residuals; • alternative waste treatment residuals; • residuals from processing of MSW; • commercial and industrial waste, defined as wastes generated by businesses and industries (such as shopping centres, restaurants and offices) and institutions (such as schools, hospitals and government offices); and • pre-sorted construction and demolition waste resulting from demolition, erection, construction, refurbishment or 	<ul style="list-style-type: none"> • householder source separated residual MSW; • material recovery facility residuals; • alternative waste treatment residuals; • residuals from processing of MSW; • commercial and industrial waste, defined as wastes generated by businesses and industries (such as shopping centres, restaurants and offices) and institutions (such as schools, hospitals and government offices); and • pre-sorted construction and demolition waste resulting from demolition, erection, construction, refurbishment or

Element	Location	Previously Authorised Extent	Authorised Extent
		alteration of buildings or from the construction, repair or alteration of infrastructure-type development (such as roads, bridges, dams, tunnels, railways and airports).	alteration of buildings or from the construction, repair or alteration of infrastructure-type development (such as roads, bridges, dams, tunnels, railways and airports).
Waste types not permitted to be processed		<ul style="list-style-type: none"> • scheduled wastes, as defined by ANZECC for the National Strategy for the Management of Scheduled Waste (1992); • medical waste; • radioactive waste; • asbestos; • liquid and oily wastes; • contaminated soils; • tyres; • animal carcasses; • waste with a halogen content greater than 1% • highly corrosive or toxic liquids or gases such as strong acids or chlorine or fluorine; and • dewatered biosolids/ sewage sludge and biomass. 	<ul style="list-style-type: none"> • scheduled wastes, as defined by ANZECC for the National Strategy for the Management of Scheduled Waste (1992); • medical waste; • radioactive waste; • asbestos; • liquid and oily wastes; • contaminated soils; • tyres; • animal carcasses; • waste with a halogen content greater than 1% • highly corrosive or toxic liquids or gases such as strong acids or chlorine or fluorine; and • dewatered biosolids/ sewage sludge and biomass.

Note: Text in **bold** in Table 1 and Table 2 indicates a change to the proposal.

Table 3: Abbreviations

Abbreviation	Term
CEO	The Chief Executive Officer of the Department of the Public Service of the State responsible for the administration of section 48 of the Environmental Protection Act 1986, or his delegate.
Commencement of stable operations	Commencing operation of the plant infrastructure for the proposal post commissioning and start-up of the plant infrastructure.
Proven Grate Combustion Technology	Technology provided by a supplier with a track record in providing grate combustion systems to waste to energy resource recovery facilities, which recover energy from municipal solid waste at a similar scale to the proposal, and which is consistent with the Environmental and Health Performance of Waste to Energy Technologies under section 16(e) of the <i>Environmental Protection Act 1986</i> , April 2013.
MSW	municipal solid waste

Figures (attached) – all previous Figures in Schedule 1 are replaced by the following:



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Unique Record ID:

Figure 1: Regional context



Figure 2: Development envelope

All coordinates are in metres, listed in Map Grid of Australia Zone 50 (MGA Zone 50), datum of Geocentric Datum of Australia 1994 (GDA94).

Coordinates defining the development envelope are held by the Department of Water and Environmental Regulation, Document Reference Number 2018-1522986492451.

Hon. Amber-Jade Sanderson MLA
MINISTER FOR ENVIRONMENT

Approval date: _____

Appendix B: Recommended conditions

STATEMENT TO CHANGE THE IMPLEMENTATION CONDITIONS APPLYING TO A PROPOSAL (Section 46 of the *Environmental Protection Act 1986*)

KWINANA WASTE TO ENERGY PROJECT

Proposal: To build and operate a waste to energy plant ~~and brick making facility~~ on Lot 9501 Leath Road, Kwinana in the Kwinana Industrial Area, approximately 40 kilometres south of Perth, Western Australia.

Proponent: Kwinana WTE Project Co Pty Ltd
Australian Company Number 165 661 263

Proponent Address: Lot 9501 Leath Road
Kwinana, WA 6167

Report of the Environmental Protection Authority: 1718

Preceding Statement/s Relating to this Proposal: 1016

Pursuant to section 45 of the *Environmental Protection Act 1986*, as applied by section 46(8), it has been agreed that the implementation conditions set out in Ministerial Statement No. 1016, be changed as specified in this Statement.

Condition 7 of Ministerial Statement 1016 is deleted and replaced with:

7 Ash Characterisation and Reuse

7-1 The proponent shall manage the implementation of the proposal to meet the following environmental objective:

- (1) The proponent shall demonstrate that all practical and reasonable measures have been undertaken to reuse the ash, and if not possible, shall be transferred to an appropriate license landfill facility.

7-2 Prior to the commencement of stable operations, the proponent shall prepare and submit an Ash Characterisation Survey Plan to the requirements of the CEO. The Ash Characterisation Survey Plan shall:

- (1) provide a reliable and accurate hazard characterisation of ash residues produced; and
- (2) detail the proposed methodology to measure compositional consistency with variations in waste inputs to demonstrate the residues produced are

suitable for the recovery, reuse, treatment or disposal option selected in accordance with the Ash Management Plan required by condition 7-5.

- 7-3 After receiving notice in writing from the CEO that the Ash Characterisation Survey Plan satisfies the requirements of condition 7-2, the proponent shall undertake the characterisation of the ash during the first twelve (12) weeks of stable operations in accordance with the Ash Characterisation Survey Plan.
- 7-4 On completion of the Ash Characterisation Survey undertaken during the first twelve (12) weeks of stable operations, the proponent shall report to the CEO on the following:
- (1) completion of the Ash Characterisation Survey; and
 - (2) the results of the Ash Characterisation Survey.
- 7-5 Prior to the commencement of stable operations, the proponent shall prepare and submit, for approval by the CEO, an Ash Management Plan. The approved Ash Management Plan shall be implemented such that:
- (1) plant residues are separated and stored onsite to maximise the recovery of residues;
 - (2) residues are characterised in accordance with condition 7-3 and are directed to the appropriate offsite recovery, treatment or disposal facility based on the outcomes of the characterisation as required by condition 7-4(2); and
 - (3) where a recovery option is not available residues will be managed by disposal to a suitably licensed disposal facility.
- 7-6 The proponent shall continue to implement the management actions and monitor in accordance with the requirements of the Ash Management Plan until the CEO has confirmed by notice in writing that it has been demonstrated that the objective in condition 7-1 is being and will continue to be met and therefore the implementation of the management actions and monitoring is no longer required.
- 7-7 The proponent may review and revise the Ash Management Plan.
- 7-8 The proponent shall review and revise the Ash Management Plan as and when directed by the CEO.
- 7-9 The proponent shall implement the latest revision of the Ash Management Plan, which the CEO has confirmed by notice in writing, satisfies the requirements of condition 7-5.

Appendix C: Identified Decision-Making Authorities

The decision-making authorities (DMAs) in the table below have been identified for the purposes of s. 45 as applied by s. 46(8) of the *Environmental Protection Act 1986*.

Decision-Making Authority	Legislation (and approval)
1. Chief Executive Officer, Department of Water and Environmental Regulation	<i>Environmental Protection Act 1986</i> (Works approval and licence)
2. Economic Regulation Authority	<i>Electricity Industry Act 2004</i> (Licence for electricity generation works)
3. Chief Executive Officer, City of Kwinana	<i>Health Act 1911</i> (Treatment of sewage) <i>Building Act 2011</i> (Building permit)

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