Kwinana Waste to Energy Project

Waste Acceptance Systems Plan (WASP)



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TERMS AND DEFINITIONS

TERM/ABBREVIATION	DEFINITION
CEO	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.
DWER	Department of Water and Environmental Protection
EPA	Environment Protection Authority
KWtE	Kwinana Waste to Energy
MS	Ministerial Statement
O&M Contract	Operation & Maintenance Contract
O&M Contractor	Operation & Maintenance Contractor
WAMMP	Waste Acceptance Monitoring and Management Plan
WARR Act	Waste Acceptance and Resource Recovery Act 2007
WDMMS	Waste Delivery Monitoring and management System
WASP	Waste Acceptance Systems Plan
CEO	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.
DWER	Department of Water and Environmental Protection
EPA	Environment Protection Authority
KWtE	Kwinana Waste to Energy

1. INTRODUCTION

The Kwinana Waste to Energy (KWtE) facility is located in the Kwinana Industrial Area, approximately 40km south of Perth, Western Australia. The facility is owned by Kwinana Waste to Energy Project Co and uses world-class technologies to process up to 460,000 tonnes per year of residual (post recycling) waste, significantly reducing CO₂ emissions, diverting waste from landfill and can deliver 36MW of baseload electricity to the grid. Veolia ANZ is the Operation and Maintenance (O&M) contractor to operate and maintain the facility under a performance and maintenance contract.

1.1 Background

The Kwinana WtE facility has received approvals under the Environmental Protection Act, 1986 which include conditions that limit the type of waste that can be accepted at the facility. The waste acceptance criteria for the facility were initially established through Ministerial Statement 1016 in September 2015 to ensure that all waste received at the facility is recorded, categorised and processed appropriately to demonstrate compliance with waste types that are permitted to be processed at the facility. The waste types that could be accepted were restricted to ensure protection of the environment to ensure that the recovery of energy from waste was targeting residual wastes and not wastes that could be recycling or re-used. However, the initial approval conditions did not clearly define residual wastes as it may relate to the waste types that could be accepted at the KWtE facility.

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In November 2017 the Minister for Environment requested the EPA to inquire into the adequacy of operating conditions placed on approved WTE facilities in Western Australia with the purpose of ensuring that waste received at WtE facilities was restricted to 'residual wastes' in accordance with the Waste Avoidance and Resource Recovery Act 2007 (WARR Act). As an outcome of the enquiry, and as recommended by the EPA in its report 1623, the approval conditions were amended through Ministerial Statement 1093 to include a condition for 'residual waste' that requires the facility to develop and submit a Waste Acceptance Systems Plan (WASP), which:

- shows that the technology has the ability to operate on residual waste only;
- describes the waste types accepted and the source separation process; and
- details the procedures and measures to be implemented.

The revised Ministerial Statement included a definition for residual waste as:

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.

EPA Report 1623 makes some clarifications of its findings and recommendations that are relevant to the development of this WASP, including:

- the timing targets in the, then, draft Waste Strategy adds a level of detail that goes beyond the intention of the condition for residual waste;
- the residual waste condition is designed to be flexible for WtE facility operators but encourages continuous improvement towards accepting only residual waste over time;
- the WtE facility proponents/operators do not have control over the waste separation practices for all the waste generators and that the amended approval conditions allows proponents to be able to accept only residual waste as waste generators improve source separation practices.

In addition to the above-mentioned Ministerial approvals the waste acceptance to the KWtE considers the following regulatory requirements, policies, and guidelines.

- Waste Acceptance and Resource Recovery Act 2007
- Environmental Protection Act 1986
- Western Australia's Waste Avoidance and Resource Recovery Strategy 2030
- Dangerous Goods Safety Act 2004
- Environmental Protection (Controlled Waste) Regulations 2004
- Works Approval W5911/2015/1
- ANZECC National Strategy for the Management of Scheduled Waste, 1992.

1.2 Objective

This WASP has been developed to ensure the following objective is achieved by the KWtE facility:

Ensure that the Kwinana Waste to Energy Project facility has the ability to accept residual waste only as defined in Ministerial Statement 1093.

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2. ROLES AND RESPONSIBILITIES

The Main roles and their corresponding responsibilities at KWtE facility relevant to this Plan are presented below (Table 2-1).

Role	Responsibilities	
General Manager	Overall accountability for the O&M Contract including the following:	
	Facility operations	
	Ensuring legal compliance	
	Working to controlling procedures and quality	
	Health and safety and environmental systems	
	Operating the Service Contract as a business unit	
	Establishing the continuous improvement agenda in conjunction	
	with facility owner	
QHSE Manager	Ensures that the QHSE management system is properly	
	established, implemented and maintained	
	 Reports on the system's performance and highlighting any 	
	improvements needed	
	Liaises with external parties on matters pertaining to the	
	management system	
Operations Manager	Overall responsibility for the implementation of the Plan and adherence	
	to reporting requirements.	
Operations Supervisor	Ensures site compliance and carries out reporting to EPA, Councils.	
Shift Leader	Responsibility for assessing the level of Unacceptable Waste and	
	for determining whether a load should be Rejected or Accepted.	
	• Ensures compliance with all aspects of the Environmental Permit.	
	Represents Company management outside normal office hours.	
Control room operators	Operate the plant to ensure that all statutory/licensing	
	requirements are maintained.	
Plant Operators	Supervise the incoming wastes.	
	Supervise the out-loading of transfer of wastes and residues	
	(bottom ash & FGT residues).	
	 Undertake period inspections of incoming waste loads. 	
All	Responsibility to report suspected contamination and to safely	
	segregate a suspected contaminated load for assessment by the	
	Shift Leader.	
Authorised delivery vehicle	Provide information on waste type of load at point of entry	
drivers		

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3. IMPLEMENTATION

3.1 Description of Residual Waste Types

The following waste types constitute the waste that would be accepted by the facility if it were to only accept residual wastes as defined in the background section above.

- 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 20% is residual waste and therefore 'available' for energy recovery.
- Pre-sorted construction and demolition wastes that are subject to waste recovery where up to 20% is residual waste and therefore 'available' for energy recovery.

3.2 Verification of Technology

The KWtE facility has been designed and constructed to process a range of waste types with a calorific value that may range from 7.0 MJ/kg to 14 MJ/kg as demonstrated by the combustion diagram in Figure 1 The expected change in the energy content in the residual waste stream as a result of the increased focus on source separation of recyclable wastes, including plastics, paper, food waste and garden organics can be accommodated by the design and proposed operational regime has been accounted for in the design of the Facility. Waste processed will be mixed in the bunker to ensure a homogenous feedstock. This means that the Facility can accept waste with a calorific value outside the combustion diagrams range (7-14 MJ/kg). The calorific value of the feedstock for the process will be between 7-14MJ/kg post mixing in the waste bunker.



Figure 1 - KWtE Combustion Diagram

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The KWTE facility will continue to operate with the ability to accept residual waste only as defined in Ministerial Statement 1093, which states:

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.

3.3 Source Separation Process for Accepted Wastes

The description of the source separation process implemented by waste suppliers for the waste types accepted by the facility are provided in Table 3-1 below.

Waste sector (As defined in Australian standard for waste and resource recovery data and reporting, 27 March 2024)1	Waste Type (As defined in KWtE Waste Acceptance Protocol)	Waste Classification – (MS1016/MS1093).	Source separation process
MSW	Household Weekly Collection Waste	Householder Source Separated MSW – no removal of organics.	Waste remaining from two-bin kerbside collection of householder source separated co-mingled recyclable material, but without removal of FOGO materials
MSW		Householder Source Separated Residual MSW – with organics removed (FOGO system) ₂	Source separation by households following the Better Practice FOGO Services ₂ for implementation of a three-bin kerbside collection system, which includes separation of food organics and garden organics (FOGO), co-mingled recyclables and non-recyclable residual wastes.
MSW	Mixed Bulk Verge Collection Waste	Householder Source Separated MSW – no removal of organics.	Waste from household source separated verge collections with no removal of organics that only contain waste material that is not unacceptable waste.
MSW	Contaminated Separated Green Waste	Material Recovery Facility Residuals	Source separated green waste which has a level of other materials that make it unsuitable for use at an organic or green waste processing facility.
MSW	Contaminated Separate Organic Wastes	Material Recovery Facility Residuals	Source separated green waste which has a level of other materials that make it unsuitable for use at an

Table 3-1: Waste Type Definitions and Source Separation Process for Waste Types Permitted to be Processed

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			organic or green waste processing facility
MSW	Litter/Public place/ event waste	Commercial and Industrial Wastes	Wastes collected by or on behalf of a waste supplier from litter bins, public places, or from events and only contains waste material that is not
MSW and/or C&I	Materials recovery facility residuals that would otherwise be destined for landfill disposal.	Material Recovery Facility Residuals, or Residuals from Processing of MSW.	Waste from material recovery processes that do not contain unacceptable wastes and would otherwise be disposed of to landfill.
C&I	Post recycled e- waste	Material Recovery Facility Residuals	Electronic wastes which has been pre-processed to recover recycles materials and to remove materials which would otherwise be considered unacceptable or incompatible with a waste to energy resource recovery process.
C&I	Alternative waste treatment plant residuals which would otherwise be destined for landfill disposal	Alternative material Recovery facility Residuals.	Waste from alternative material recovery processes that do not contain unacceptable wastes and would otherwise be disposed of
C&I	Commercial and industrial Wastes	Commercial and Industrial Waste, Defined as Wastes Generated by Businesses And Industries	Solid waste generated from commercial and industrial activities and enterprises which has been collected or received on behalf of a waste supplier, or missed waste received at a drop off facility operated by or on behalf of a waste supplier and only contains waste materials that is not Unacceptable Wastes but includes wastes generated by businesses and industries (such as shopping centres, restaurants and offices) and institutions (such as schools, hospitals and government offices).
C&D	Construction and Demolition Derived Waste	Pre-Sorted Construction and Demolition Waste	Construction and demolition waste that only contains waste material that is not unacceptable waste, and is pre-sorted construction and demolition waste resulting from demolition, erection, construction, refurbishment or alteration of buildings or from the construction, repair or alteration of infrastructure-

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Notes:

1. Definitions of waste sector as defined in Australian standard for waste and resource recovery data and reporting, v3.4, 2024

- Commercial and industrial (C&I) waste = Waste that is produced by institutions and businesses, including offices, schools, restaurants, retail and wholesale businesses, and industries such as manufacturing. Also includes waste from primary and secondary production, such as mining and minerals processing. Encompasses waste from all Australia and New Zealand Standard Industrial Classification (ANZSIC) codes except Division E and Group 753.
- Construction and demolition (C&D) waste = Waste produced by demolition and building activities, including road and rail construction and maintenance and excavation of land associated with construction activities. Consistent with ANSIC Division E.
- Municipal solid waste (MSW) = Waste produced by households or collected by, or on behalf of, a municipal council. Includes waste from: street bins, street sweeping, litter and dumping clean ups, aquatic litter traps, municipal parks and gardens, street tree prunings, council facility operations (consistent with ANZSIC Group 753), transfer stations (other than waste readily identifiable as arising from commercial operations). Excludes waste: collected by, or on behalf of, a municipal council from businesses; from road works undertaken by, or on behalf of, a municipal council.
- Municipalities that have implemented the Better Practice FOGO Services for implementation of a three-bin kerbside collection system include: Cities: Albany, Bayswater, Belmont, Bunbury, Fremantle, Kalamunda, Melville, Nedlands, Perth, Subiaco, Swan and Vincent

Shires: Augusta-Margaret River, Collie, Dardanup, Esperance, Harvey, Mundaring and Serpentine-Jarrahdale

Towns: Bassendean, Claremont, Cottesloe, East Fremantle and Mosman Park. (WA Waste Authority, 2023)

 To date the only Better Practice Guideline issued by the Waste Authority is the Better Practice FOGO Services for implementation of a three-bin kerbside collection system, which includes separation of food organics and garden organics (FOGO) from other waste categories (WA Waste Authority, 2023).

All suppliers of waste to the KWtE facility implement a waste collection system that incorporates waste recovery through source separation. Waste supplier specific source separation processes are presented below (Table 3 2). Listed waste suppliers are current at the time of publication of this WASP. Any new contracts entered into with waste suppliers not listed in Table 3-2 will be subjected to the same waste acceptance conditions and restrictions as those which are listed so as to ensure compliance with this Plan.

 Table 3-2: Waste Supplier Source Separation Processes. Presented waste suppliers are current at the time of publication.All additional future waste suppliers will be reflected in the annual audit and review of this document

Waste Suppliers	Source of waste	3 bin system in place	Better bins plus: Go FOGO participant*	Source separation process
Rivers Regional Council	Residents and businesses of:	No	No	waste and recycling services for properties. Each property has: - a recycling bin with a yellow lid (collected fortnightly) -general waste bin with a

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		dark green or red lid (collected weekly)
No	No	brovides waste and recycling services for properties. Each property has: - a recycling bin with a yellow lid (collected fortnightly) -a 240-litre general waste bin with a grey lid (collected weekly)
No	No	brovides waste and recycling services for properties. Each property has: - a 240-litre recycling bin with a yellow lid (collected fortnightly) - a 240-litre general waste bin with a dark green lid (collected weekly)
No	No	provides waste and recycling services for properties and provides general waste and recycling bins.
No	Yes	provides waste and recycling services for properties. Each property has: - a recycling bin with a yellow lid (collected fortnightly) - a general waste bin with a dark green or red lid (collected weekly)
No	No	provides waste and recycling services for properties. Each property has: - a recycling bin with a yellow lid (collected fortnightly) -general waste bin with a

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				dark green or red lid (collected weekly)
		No	No	provides waste and recycling services for properties. Each property has: - a recycling bin with a yellow lid (collected fortnightly) -general waste bin with a dark green lid (collected weekly)
Resource Recovery Group	Residents and businesses of:	Yes	Yes	households and most units and apartments receive:
				 a FOGO bin with a lime green lid (collected weekly) a recycling bin with a yellow lid (collected fortnightly) a general waste bin with a red lid (collected fortnightly)
				At this stage, the 3 bin FOGO system is only available for residential properties.
		Yes	Yes	provides waste and recycling services for properties. Each property has: - a 240-litre FOGO bin with a lime green lid (collected weekly) - a 240-litre recycling bin with a yellow lid (collected fortnightly) - a 140-litre general waste bin with a red lid (collected fortnightly)
		Yes	Yes	provides waste and recycling services for properties. Each property has:
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			green lid (collected weekly) - a recycling bin with a yellow lid (collected fortnightly) - a general waste bin with a red lid (collected fortnightly)
City of Kwinana	No	No	brovides waste and recycling services for properties. Each property has: a recycling bin with a yellow lid (collected fortnightly) a general waste bin with a drak green lid (collected weekly) The City will be rolling out the GO bin in the 2024/25 financial year. Then: a 240-litre GO bin with a lime green lid (collected fortnightly) will automatically be given to all residential properties over 350 m2. A smaller property or a commercial business can opt in at any time to the three bin GO system. a 240 or 360-litre recycling bin with a yellow lid (collected fortnightly) a 140-litre general waste bin with a red lid (collected

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4. IMPLEMENTATION OF MEASURES AND PROCEDURES

4.1 Waste Acceptance

The operation will implement the Waste Acceptance Monitoring and Management Plan (WAMMP) to demonstrate that waste types not permitted for processing are not accepted or processed at the KWTE facility.

4.1.1 Residual Waste

All waste accepted at the KWtE facility is considered to be residual waste, as defined in MS1016/ MS 1093, except for the Householder Source Separated Residual MSW – no removal of organics, being that waste from municipalities with a 2-bin kerbside collection system.

At the time of Commissioning of the KWtE facility, the volume of waste that is not considered residual, as defined in MS 1016/ MS1093, will be reported as a proportion of the total waste accepted during commissioning.

The waste types available for acceptance at the kWtE facility is largely driven by commercial factors, including existing contract with waste suppliers. The facility will seek to increase the proportion of residual waste that is aligned with the WA Waste Strategy through the following strategic actions:

- a) Prioritise acceptance of residual waste aligned with the State's Waste Strategy where commercial contracts and availability of suitable wastes allow.
- b) Work with waste suppliers to seek to improve waste separation processes undertaken by generators.
- c) Continue to engage and work with waste industry, regulators and policy makers to transition towards energy recovery from residual wastes only.
- d) Provide reports annually on the measured performance of the facility against its transition to acceptance of residual waste only.

4.2 Continuous Improvement

The KWtE facility will continuously improve its performance in acceptance of residual waste through:

- a) Annually reviewing the WAMMP and WASP in consideration of performance with the aim of refining implementation actions to achieve Plan objectives.
- b) Documenting and investigation incidents of non-conformance with the WAMMP and WASP and applying the findings in improving the plans.
- c) Applying the findings of from audits of this Plan to seek to improve implementation measures and procedures.

5. REPORTING AND REVIEW

5.1 WASP Review and Reporting

This Plan will be revised annually for submission to the CEO prior to 31 October each year and will include:

- A description of the residual waste types that the facility could accept, if it only operated on residual waste, in consideration of 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.
- A description of the source separation processes, as provided by the generator of the waste, for the waste types and volumes reported in accordance with the WAMMP.
- A comparison of the relative proportion of residual waste types accepted by the facility from previous years.
- A summary of the continuous improvement outcomes from the review of the WASP as described in Section 3.5 which will provide details on how the objectives of this WASP can be better achieved and /or improved.

All updates in the WASP are recorded in the document change log – Appendix 1..

5.2 Independent Review

KWtE will engage a suitable qualified and experienced consultant to undertake an annual independent review of the implementation of the WASP's and compliance with the Plan's objectives. Specifically, the audit will assess the facility's compliance against Condition 8-1 of MS1016 and document the findings in an annual independent review report.

The findings of the independent review will be reported to the CEO in the annual Compliance Assessment Plan (as required by Condition 4-1 of MS1016).

6. **REFERENCES**

Australian and New Zealand Environment and Conservation Council (ANZECC). National Regulation for the Management of Scheduled Waste. (1992). <u>https://www.dcceew.gov.au/environment/protection/chemicals-management/scheduled-waste</u>

Government of Western Australia Department of Justice. Environmental Protection (Controlled Waste) Regulations (2004).

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