



Hume Food and Garden Organics Facility

Waste Management Plan

Transport Canberra and City Services Directorate

25 October 2023



→ The Power of Commitment

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Terminology

Terminology	Definition
Impact	The effect of a project, which can be adverse or beneficial, when measured against an existing condition
Proposal	The construction and operation of the proposed materials recovery facility in Hume, Australian Capital Territory
Proposal site	The area within which all the Project construction and operational elements will be contained within
Study area	Consists of land in the vicinity of, and including, the proposal site. The study area is a wider area surrounding the proposal site as defined in this assessment, including land that has the potential to be indirectly impacted by the proposal
AS 4123.7-2006	Mobile Waste Container

Abbreviations and meaning

Abbreviations	Meaning
ACT	Australian Capital Territory
CEMP	Construction Environmental Management Plan
DCP	Development Control Plan
EIS	Environmental Impact Statement
EPSDD	Environment, Planning and Sustainable Development Directorate
FOGO	Food Organics and Garden Organics
GHD	GHD Pty Ltd
ha	Hectare
HRRE	Hume Resource Recovery Estate
IZ1	General Industry Land Zoning
L	Litre
m	Metre
MRF	Materials Recovery Facility
NSW	New South Wales
PSI	Preliminary Site Investigation
RORO Compactor	Roll-On, Roll-Off Compactor
RMC	Resource Management Centre
t	Tonne
TCCS	Transport Canberra and City Services
WMP	Waste Management Plan
WM Strategy	<i>ACT Waste Management Strategy 2011-2025</i>

1. Introduction

1.1 Overview

The Australian Capital Territory (ACT) Government has identified diversion of municipal food organics and garden organics (FOGO) waste from landfill as a key action to achieve resource recovery and emissions reduction targets.

In-vessel composting, processing only FOGO wastes collected from households in the ACT, has been selected as the preferred option for the process. In this process, composting is contained within a vessel or building and aeration and temperature is controlled to optimise the composting process.

ACT NoWaste has proposed to develop an in-vessel FOGO waste facility in Hume, ACT (the proposal) to strengthen Canberra's circular economy and meet Territory and Federal targets. The facility will be designed to have an annual processing capacity of 70,000 tonnes per annum (tpa) to meet future demand. The proposed development is to occur in Block 5, Section 26 Hume, off John Corey Road.

1.1.1 Approval and assessment requirements

This report has been prepared by GHD Pty Ltd (GHD) as part of the environmental impact assessment (EIS) for the proposal. The EIS supports the application for approval of the proposal and to address the requirements provided by the ACT Department of Environment, Planning and Sustainable Development Directorate (EPSDD) dated 21 July 2022.

The proposal is subject to approval by the planning and land authority within the EPSDD.

1.2 The proposal location

The proposal is situated on Block 5, Section 26 Hume, off John Corey Road on Territory Land in the ACT. The proposal site is located in proximity to a number of industrial facilities. ACT Skip Hire is on the adjacent block to the south. Further south on John Cory Road the Soft Landing Mattress Recycling facility is located. The Mugga Lane Landfill is located approximately 200 m northwest of the site.

Figure 1.2 shows the site proposed for the FOGO facility, including a preliminary site boundary configuration to accommodate these operations (subject to detailed design and final vendor process selection). In total, this area comprises approximately 4.3 hectares (ha) of land.

The Hume Industrial Estate is located to the southeast of the Monaro Highway and is accessed via Tralee Street and Sheppard Street.

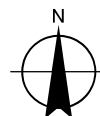
The location of the proposal site in the context of the adjoining suburbs is displayed in Figure 1.2.



- Legend**
- Proposal site
 - Cadastre
 - Watercourses

Paper Size ISO A4
0 25 50
Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

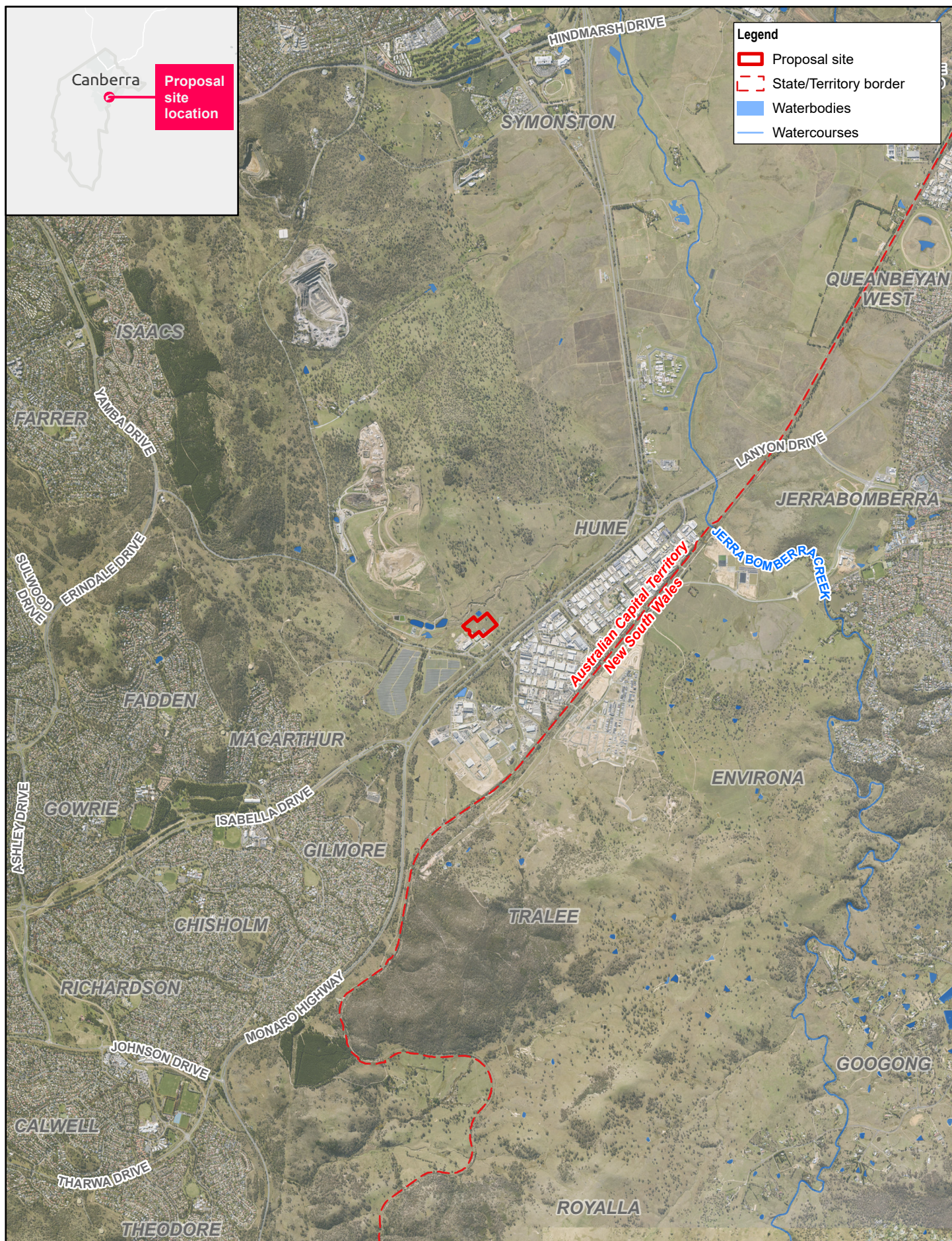


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Hume Food Organics and Garden Organics Facility
Operational Waste Management Plan

Project No. 12540460
Revision No. 0
Date 30/08/2023

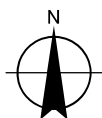
Proposal location

FIGURE 1.1



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Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55



Transport Canberra and City Services
Hume Food Organics and Garden Organics Facility
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FOGO regional context

FIGURE 1.2

1.3 Purpose of this report

This waste management plan (WMP) has been prepared to support the Environmental Impact Statement (EIS) for the proposal. The plan addresses waste handling during demolition, construction and operation phases of the proposed FOGO processing facility and aims to provide best practice in waste management and satisfies the requirements in the *Development Control Code for Best Practice Waste Management in the ACT (TCCS Waste Code 2019)* (ACT Government, 2019).

1.4 Scope and limitations

This report: has been prepared by GHD for Transport Canberra and City Services Directorate and may only be used and relied on by Transport Canberra and City Services Directorate for the purpose agreed between GHD and Transport Canberra and City Services Directorate (TCCS) as set out in Section 1.3 of this report.

GHD otherwise disclaims responsibility to any person other than TCCS 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 Section 1.5 and throughout this report. GHD disclaims liability arising from any of the assumptions being incorrect.

Accessibility of documents

If this report is required to be accessible in any other format, this can be provided by GHD upon request and at an additional cost if necessary.

GHD has prepared this report on the basis of information provided by TCCS 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.

1.5 Assumptions

The project data and assumptions used for waste management include:

- The construction period would be up to 24 months.
- Construction staff would be working up to:
 - 7 am to 6 pm Monday to Friday
 - 8 am to 6 pm Saturdays
 - 8 am to 6 pm on Sundays or Public Holidays
- There would be an average of 20 staff during construction and 60 staff during operation.
- The allowable contamination rate of the incoming feedstock would be three percent.

2. Proposal description

2.1 Proposal details

The proposal is situated on Territory Land within the suburb of Hume and surrounded by industrial facilities. ACT Skip Hire is on the adjacent block to the south. Further south, across John Cory Road is Soft Landing Mattress Recycling. South and east across Monaro Highway is the Hume Industrial Estate. The existing Hume Materials Recovery Facility is west of the proposal site across Recycling Road. The Mugga Lane Landfill is located approximately 200 metres north-west of the proposal.

The nearest residential receiver is approximately two kilometres to the west of the proposal.

Table 2.1 Proposal locality and description

Item	Details
Location	Block 5, Section 26 Hume, off John Corey Road
Existing land use	Vacant block
Zone	IZ1: General Industry
Area	42,957 m ²
Proponent	ACT NOWaste

2.2 Processing capacity and input materials

The facility would be designed to receive up to 70,000 tonnes per year of FOGO waste. It is expected that the facility would have an initial processing capacity of at least 50,000 tonnes at commencement of operations.

The design of the facility would incorporate modular elements to enable the capacity and operating parameters of the tunnel composting system to be cost-effectively expanded in future to achieve the design processing capacity of 70,000 tonnes per year.

The primary feedstock stream would be municipal kerbside collected FOGO, however the facility may also receive:

- Commercial organic waste including food organics.
- Pre-shredded 'self-haul' bulk municipal garden organic material from waste transfer stations.

2.3 Process description

In-vessel composting processing has been selected as the preferred option for the process as it provides odour control and management of contaminated run-off into the nearby Dog Trap Creek. In this process, composting is contained within a vessel or building, and aeration and temperature would be controlled to optimise the composting process.

It incorporates a tunnel composting process with air quality management via extraction and biofiltration, and a high level of process monitoring and control of critical process parameters. This minimises the environmental impact of the operation and enables production of consistently high-quality recycled organic products.

The process comprises the following main elements:

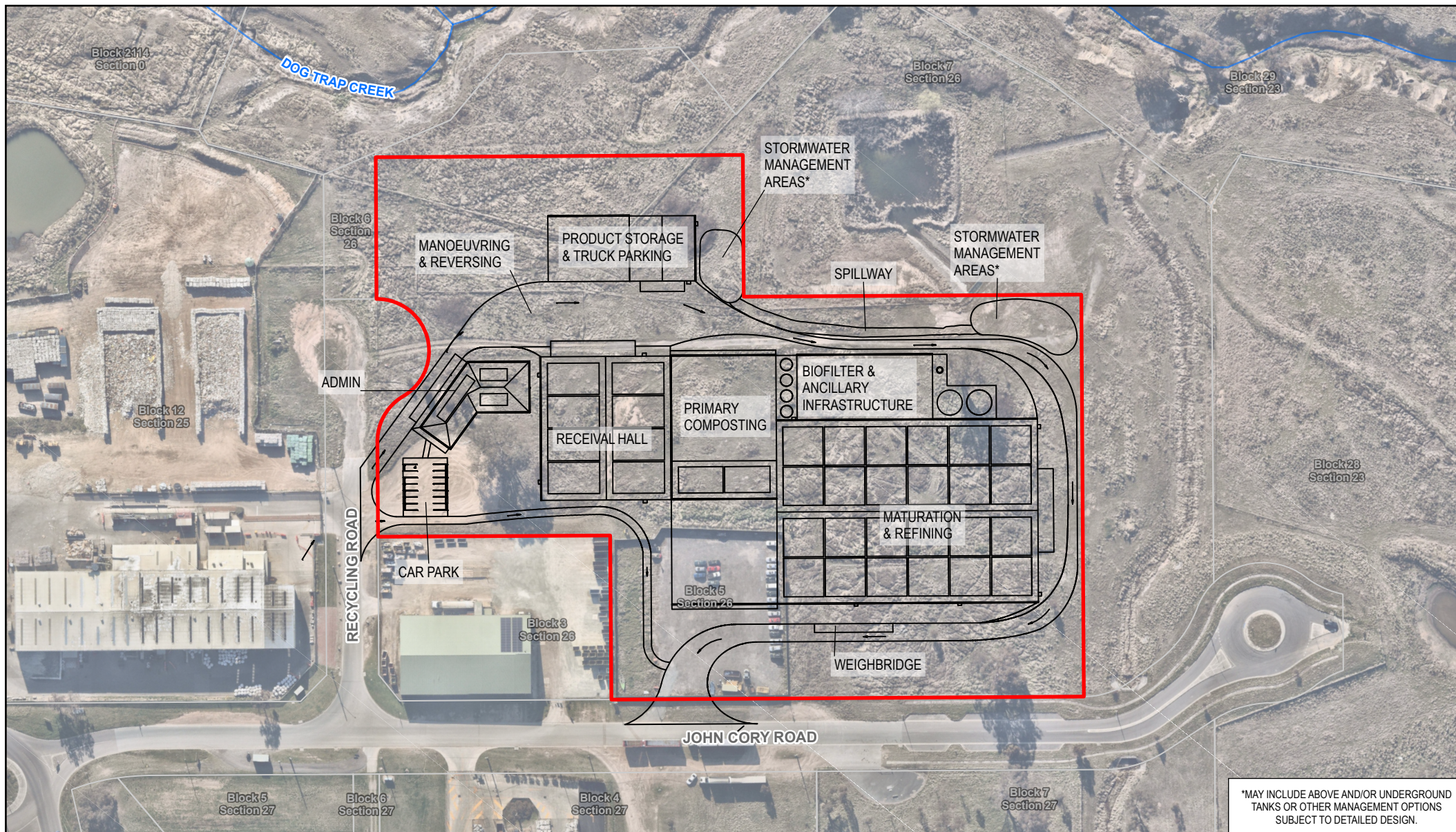
- FOGO waste receipt and decontamination.
- Shredding, mixing and moistening.
- Pasteurisation and composting in enclosed tunnels with forced aeration.
- Enclosed maturation in static piles (on hardstand).
- Product refinement.
- Residual waste management (materials removed during decontamination and product refinement).

It is intended that the facility would operate on a single shift basis with waste acceptance (opening hours) from Monday to Friday to coincide with and accommodate deliveries from municipal kerbside collection trucks, as well as bulk product load-out to wholesale offtake. Weekends would therefore be available for carrying out planned (and unplanned) repairs and maintenance, thereby providing a high level of processing continuity assurance.

Further information is provided in the EIS.

2.4 Proposal site layout

The indicative concept design for the FOGO facility is shown in Figure 2.1.



*MAY INCLUDE ABOVE AND/OR UNDERGROUND TANKS OR OTHER MANAGEMENT OPTIONS SUBJECT TO DETAILED DESIGN.

Legend

- ▬ Proposal site
- ▬ Proposal site layout
- Cadastre
- ▬ Watercourses

Paper Size ISO A4
 0 20 40
 Metres
 Map Projection: Transverse Mercator
 Horizontal Datum: GDA 1994
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Transport Canberra and City Services
 Hume Food Organics and Garden Organics Facility
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Indicative concept layout

FIGURE 2.1

3. Context

This WMP has been developed in accordance with the *TCCS Waste Code 2019* (ACT Government, 2019). Table 3.1 and Table 3.2 list the submission requirements and where these requirements are addressed within this plan.

Table 3.1 *Submission requirements for commercial, public and industrial developments*

Number	Submission Requirement	Response
R1	Each development application must include a completed copy of all relevant Parts of the WRMP.	N/A
R2	Development application submission documents must include plans, elevations, sections and written descriptions or specifications for collection services, as applicable, showing:	-
R2.1	– the specific wastes and recycling likely to be generated by each of the proposed activities accommodated in the development including likely volumes, storage requirements and proposed bins.	Section 5.1
R2.2	– the location and dimensions of all individual waste and recycling storage or holding areas and waste and recycling storage facilities (including refrigerated waste storage if used) for the entire development. These must include tabulated calculations to demonstrate the adequacy of the space.	Section 5.1
R2.3	– documentation that adequately describes the method of transferring waste and recycling within the development from the point of origin to the waste and recycling storage facilities. Dimensions, clearances, gradients and any mitigation of odour and noise impacts must also be provided. A specific collection time is not permitted for the purpose of supporting a design proposal under this requirement.	Section 5.2
R2.4	– the location of the designated collection point for the collection and emptying of waste and recycling MGBs or, if hoppers are to be used, the location of the hopper pads.	Section 5.2.2
R2.5	– the path of travel for moving bins from individual storage facilities to the designated collection point, indicating dimensions, clearances and gradients.	Section 5.2.2
R2.6	– the on-site path of travel for collection vehicles indicating all clearances, travel, turning and manoeuvring paths, ramp access and pavement details.	Section 5.2.2
R2.7	– the location of waste and recycling chutes and the location and dimensions of any waste service compartments on each floor of the building associated with these. These must be accompanied by tabulated calculations to demonstrate the adequacy of the space.	N/A. Buildings in the proposed site are single storey developments.
R2.8	– supporting documentary evidence on the type of compaction and associated waste and recycling plant and equipment proposed, including: manufacturer, model, compaction ratio, dimensions including maximum height at point of lift, volume, and expected weight when fully loaded at the defined compaction ratio.	N/A
R2.9	– details on the waste and recycling facilities to receive waste and recyclables where RORO compactors are to be used, as indicated in R2.8.	Section 5.2.3

Table 3.2 *Submission requirements for demolition, excavation and construction*

Number	Submission Requirement	Response
R1	A development application must include a completed copy of Section 3 of the WRMP	N/A
R2	Development application submission documents must include proposal site plans and written descriptions or specifications, as applicable, and must:	-
R2.1	– specify waste demolition, excavation and construction materials by type and volume.	Section 4.1 and 4.2
R2.2	– nominate reuse and recycling potential or uses of demolition, excavation and construction waste materials for either on-site or off-site use.	Section 4.3.4
R2.3	– nominate on-site areas for the sorting of demolition, excavation and construction waste materials, if applicable.	N/A. Waste would be transferred off-site for recovery or disposal
R2.4	– describe the work method practices and specific procedures that will be adopted to maximise the reuse and recycling of waste materials.	Section 4.3.1
R2.5	– identify access details for all vehicles involved in moving excavation, demolition and construction waste.	Section 4.3.2 Section 4.3.3
R2.6	– provide a draft site plan indicating the nominated on-site storage areas for demolition, excavation and construction waste materials and waste transport vehicle access locations; the site plan must also show existing regulated trees on the proposal site.	Section 4.3.2
R2.7	– supply details of waste or recycling storage containers that will be stored outside leased boundaries (i.e. on public land). Separate approval is required from Public Land Use, City Services (phone 132 281).	N/A. Waste would be stored on-site prior to removal
R2.8	– specify locations and identify the operator of approved licensed sites for the recycling or reprocessing or landfill disposal of demolition, excavation and construction materials.	Section 4.3.4

4. Demolition and construction phase

4.1 Demolition waste quantities

A demolition plan for the facility is not currently available and therefore estimation factors have been used to assess demolition waste quantities.

Asphalt waste has been estimated based on the proposed facility layout, the existing asphalt area that would be required for construction of the access road and the facility footprint which is assumed to be 1,100 square metres. Assuming that the asphalt thickness is 50 millimetres, the volume of asphalt waste would be approximately 55 cubic metres.

Three stockpiles were identified by the Preliminary site investigation (PSI) (GHD, 2022) which include:

- 260 cubic metres stockpile on north-eastern boundary (not wholly on the proposal site).
- 40 cubic metres stockpile adjacent to the south-west boundary.
- 140 cubic metres stockpile on northern boundary.

The contents of the stockpiles are not able to be confirmed until the detailed site investigation is completed. For the purposes of this assessment, it is assumed that the stockpiles contain contaminated material which would be removed from the proposal.

The PSI also identified some unknown fill material. For the purposes of this assessment, it is assumed that this material would not be removed from the proposal, however this would be confirmed during the detailed site investigation.

Quantity of spoil would be subject to detailed design and at this stage it is assumed cut and fill would be balanced and insignificant amount of spoil would be generated. The classification of waste would be re-assessed based on the DSI and any hazardous material identified such as contaminated soil would require off-site disposal.

The biodiversity assessment report identified a total vegetation clearance area of up to 2.3 hectare, which would mainly be exotic grassland with up to six immature Eucalyptus (GHD, 2022b). A decommissioned sewer main pipe that is approximately 130 metres in length is assumed to be entirely removed. This would be confirmed during the detailed design.

A summary of the expected waste generated during demolition is provided in Table 4.1.

Table 4.1 Demolition waste quantities, classifications and potential destinations

Waste stream	Likely waste classification	Unit	Estimated quantity	Storage	Potential destination	Potential end use
Asphalt	General solid waste (non-putrescible)	m ³	55	Stockpiled	Canberra Concrete Recyclers	Recycled
Excess spoil	General solid waste (non-putrescible)	m ³	Nominal	Stockpile	Reused on-site for shaping/landscaping / Mugga Lane Resource Management Centre (RMC)	Recycled/ disposed
Green waste / topsoil	General solid waste (non-putrescible)	m ³	45	Stockpile	Mugga Lane RMC	Recycled/ disposed
Stockpile materials	Hazardous waste	m ³	440	Covered stockpiles	Mugga Lane RMC	Disposed
Sewer main	General solid waste (non-putrescible)	m	130	Covered stockpile	Mugga Lane RMC	Recycled/ disposed

4.2 Construction waste quantities

Construction material quantities are not currently available and therefore estimation factors have been used to assess the amount of construction waste that would be produced during the construction phase (Table 4.2).

In the absence of an ACT specific estimation calculator, estimation factors from The Hills Shire Council Development Control Plan (DCP) Appendix A (The Hills Shire Council, 2012) have been adopted. The DCP provides guidance on typical quantities of construction wastes for office buildings, factories and flats, broken down by material types. The estimation factors for factory and office block building types have been applied to the proposal.

Table 4.2 Estimation factors for construction waste

Building type	Timber	Concrete	Bricks	Gyprock	Sand/Soil	Metal	Other
Office Block (m ³ per 1,000 m ²)	5.10	18.8	8.50	8.60	8.80	2.75	5.0
Factory (m ³ per 1,000 m ²)	0.25	2.10	1.65	0.45	4.80	0.60	0.50

The relevant building type for each portion of the proposal is shown below in Table 4.3 with the estimated quantities and proposed destinations shown in Table 4.4 and Table 4.5 respectively.

Table 4.5 demonstrates that over 90% of construction waste is expected to be recycled which exceeds the target in the *ACT Waste Management Strategy 2011-2025 (WM Strategy)* (ACT Government, 2011).

Table 4.3 Building classifications

Building	Area (m ²)	Building classification
Admin	517	Office block
Receival hall	2,684	Factory
Primary composting	3,714	Factory
Maturation and refining	6,898	Factory
Biofilter and ancillary infrastructure	2,050	Factory
Machinery shed/workshop	595	Factory
Product storage and truck parking	1,960	Factory

Table 4.4 Construction waste estimate

Building	Area (m ²)	Waste quantities (m ³)						
		Timber	Concrete	Bricks	Gyprock	Sand/Soil	Metal	Other
Admin	517	2.6	9.7	4.4	4.4	4.5	1.4	2.6
Receival hall	2,684	0.7	5.6	4.4	1.2	12.9	1.6	1.3
Primary composting	3,714	0.9	7.8	6.1	1.7	17.8	2.2	1.9
Maturation and refining	6,898	1.7	14.5	11.4	3.1	33.1	4.1	3.4
Biofilter and ancillary infrastructure	2,050	0.5	4.3	3.4	0.9	9.8	1.2	1.0
Machinery shed/workshop	595	0.1	1.2	1.0	0.3	2.9	0.4	0.3
Product storage and truck parking	1,960	0.5	4.1	3.2	0.9	9.4	1.2	1.0
Total	-	7.1	47.3	33.9	12.5	90.5	12.2	11.5

The construction workers would also generate wastes such as food wrappings, gloves, waste food, packaging, and so on. It is assumed that there are an average of 20 workers employed on-site, and each worker generates one kilogram of waste and one kilogram of recyclables per day (typical generation rate in the absence of generation rates), this results in an estimated waste and recyclables quantity of 20 kilograms or 0.02 tonnes each per day, respectively. With a 7-day working week and a 12-month construction timeframe this amounts to 7.3 tonnes of waste and 7.3 tonnes of recyclables.

It is assumed that the waste and recyclables would fall under 'other waste' and 'general recyclables' in Table 4.5 respectively. Construction waste would be managed by the contractor who would engage a private waste contractor to collect and transport the waste off-site for disposal or reuse.

Table 4.5 Waste classifications and potential destinations

Waste stream	Waste classification	Estimated waste quantity (m ³)	Storage	Potential destination	End use
Timber	General solid waste (non-putrescible)	7.1	Stockpile	The Green Shed, ACT Recycling	Recycled
Concrete	General solid waste (non-putrescible)	47.3	Stockpile	ACT Recycling, Canberra Concrete Recyclers	Recycled
Bricks	General solid waste (non-putrescible)	33.9	Stockpile	ACT Recycling, Canberra Concrete Recyclers	Recycled
Gyprock	General solid waste (non-putrescible)	12.5	Stockpile	REGYP Canberra	Recycled
Sand/soil	VENM/General solid waste (non-putrescible)	90.5	Stockpile	Reused on-site for shaping/landscaping	Recycled
Metal	General solid waste (non-putrescible)	12.2	Stockpile	Mugga Lane RMC	Recycled
Other waste	General solid waste (putrescible / non-putrescible)	31	Skip bin	Mugga Lane RMC	Disposed
General recyclables	General solid waste (non-putrescible)	36.5	Skip bin	Mugga Lane RMC	Recycled
Batteries	Hazardous waste	Nominal	Bunded and covered	Mugga Lane RMC	Recycled/disposed
Sewerage	Liquid waste	Nominal	-	Discharge to sewer	Disposed

The area for placement and transport of construction waste would be determined by the contractor prior to construction.

4.3 Waste handling and management

4.3.1 Approach to waste minimisation and re-use

All waste generated during demolition and construction would be managed using the waste hierarchy approach of avoidance and re-use before consideration is given to disposal. Procurement of excess materials would be avoided in accordance with relevant guidelines and policies, including use of precast building materials.

All wastes would be managed in accordance with the waste provisions contained within relevant legislative and policy requirements.

Should waste be found to be unsuitable for re-use or recycling, disposal methods would be selected based on the classification of the waste material in accordance with the 'Environmental Standards: Assessment and Classification of Liquid and Non-Liquid Wastes' (ACT Government, 2021).

The proposed approach to managing the different waste types in accordance with the waste management hierarchy, including measures to facilitate segregation and prevent cross contamination, is provided in Table 4.6.

The contractor would prepare a detailed demolition and construction environmental management plan that addresses key regulatory requirements and environmental management measures and procedures.

Table 4.6 Demolition and construction waste management measures

Waste	Hierarchy	Management measures
Excess spoil/existing stockpile material	Reduce	Detailed design would include measures to minimise excess spoil generation. This would include a focus on optimising the design to minimise spoil volumes and the re-use of material on-site.
	Re-use	Excess spoil from existing stockpiles and earthworks for the proposal would be stockpiled on-site for use as construction fill and landscaping purposed on-site if suitable.
	Recycle	Any existing stockpiles and excess spoil material would be stockpiled on-site and options to recycle the material would be investigation, where practicable.
	Dispose	Any existing stockpiles and excess spoil that is not suitable for re-use would be disposed of at a suitably licensed facility in accordance with the waste classification.
Green waste and topsoil	Avoid	The access road and FOGO facility would be sited to minimise disturbance to existing vegetation and utilise already cleared land as far as practicable.
	Reduce	The construction footprint would be set out during site establishment to manage the risk of incidental clearing.
	Re-use	Cleared vegetation and topsoil material for construction would be segregated and stockpiled for re-use on-site for landscaping and finishing works.
	Dispose	Weeds would be disposed of in accordance with relevant guidelines and requirements.
General waste	Recycle	Labelled and colour coded receptacles would be provided at the proposed construction-site office for general waste from construction personnel to ensure source separation of recyclable materials and residual landfill waste. These wastes would be collected on a regular basis by authorised and appropriately licensed waste collection contractors for off-site recycling or disposal.
	Dispose	Residual general solid waste would be transferred off-site for disposal at a suitably licensed facility.
Food waste	Dispose	Putrescible waste would be stored in designated bins and collected by an authorised contractor for disposal to a suitably licensed facility.
Sewage	Dispose	Sewage generated by the staff from the site office would be discharged to sewer.
Excess construction materials	Avoid	Procurement of surplus materials would be avoided, and precast building components utilised, where practicable.
	Recycle	Any excess materials generated on-site would be segregated using separate bins for different waste and recyclable materials. The recyclable material would be removed from the proposal site for further processing or re-use at appropriately licensed facilities.
	Dispose	Residual waste that cannot be recycled would be collected and removed off-site for disposal at a suitably licensed facility.
Hazardous waste	Dispose	Stockpile materials are assumed to be hazardous waste until they are confirmed otherwise. If it is hazardous waste, then the material shall be appropriately disposed of by a licensed contractor.
Asphalt waste	Recycle	Any asphalt waste would be stockpiled on-site prior to being taken off-site for reuse.
Pipe demolition waste	Dispose	Excavated sewer mains would be stored in a covered stockpile and taken off-site for disposal.

4.3.2 Waste storage locations

Demolition and construction waste would be temporarily stored on-site in an area of compacted hardstand material that would be graded to facilitate drainage (see Figure 4.1). The storage area would be bunded to contain

sediment laden run off in accordance with the sediment and erosion control plan that would be developed for construction. Stockpiles would be segregated according to classification and clearly signposted to maximise the stockpile fitness for use and reduce the risk of cross contamination. Bins would also be in the storage area to temporarily store segregated recyclable materials.

Waste generated by demolition and construction staff would be stored in mobile garbage bins in the construction compound designated storage areas. Signage identifying the waste storage area at the proposed construction-site office would be prominently displayed. All waste receptacles would be clearly and correctly labelled to identify which materials are to be placed in which bin and colour-coded in accordance with the AS 4123.7-2006: Mobile Garbage Containers (Standards Australia, 2006).

An indicative area for storage of demolition and construction waste (shown in red, approximately 750 square metres) and vehicle route is provided below in Figure 4.1. The exact area and travel path of collection vehicles would be confirmed by the demolition and construction contractor prior to works commencing.



Figure 4.1 Potential demolition waste storage area and vehicle route

4.3.3 Waste collection and transport

Demolition and construction waste would be managed by the contractor who would engage appropriately licensed private waste collection contractors to collect and transport the waste off-site for disposal or recycling following source segregation on-site.

All transport vehicles would be covered, and tailgates secured prior to trucks leaving the proposal site. All vehicles would be appropriate for transport of the waste as classified.

Documents and records of the transport and fate of all materials removed from the proposal site would be kept as proof of correct disposal and for environmental auditing purposes.

Collection vehicles shall access the waste storage area off Recycling Road and proceed through the proposal site to exit at John Cory Road.

4.3.4 Waste recycling and disposal

The waste storage area would have stockpiles that are a maximum height of four metres and a maximum width of four metres (for loose materials) in accordance with the 'Guideline for Stockpile Management' (ACT Government, 2019). Separation distances from structures in this document would be followed.

Table 4.1 and Table 4.5 identify potential options for off-site disposal and recycling for the key demolition and construction waste streams. The destinations would be confirmed by the construction contractor and included in the construction waste management plan for the proposal prior to construction commencing.

4.3.5 Waste records

A waste management register would be maintained which identifies all waste generated on-site and subsequent management. The register would document the following:

- The type and quantity of waste (including its classification).
- Whether the waste is to be reused, recycled (on or off-site) or sent for disposal.
- Tracking information (where applicable).
- Upon removal from site: date of removal, transport contractor information and final destination.

All relevant documentation such as dockets, receipts and waste classification records would be retained with the waste management register for at least 12 months from 'certificate for building work involving demolition' by the contractor.

4.4 On-site management and responsibilities

4.4.1 Signage

Waste and recycling storage areas would include signage that clearly describes the types of materials that can be deposited into recycling bins and general garbage bins.

4.4.2 On-site management

On-site management and controls would include:

- Implementation of the WMP by the contractor.
- Segregating wastes generated on-site, using different bins for recycling (individual bins for each recycling stream) and general waste.
- Discussion about the proposal site's waste management and recycling policies and practices with employees and subcontractors during site inductions and toolbox talks.
- Discussion with waste collection contractors to seek optimal waste recovery measures.
- Ensuring all waste disposal bins are clearly marked with appropriate signage and instructions.
- Keeping records of quantities of waste and recycled materials disposed of, and the destinations of these materials.
- Ensuring that wastes are only disposed to licensed facilities.

4.4.3 Roles and responsibilities

While all personnel working on the proposed facility are responsible for waste separation and correct disposal, the Contractor Project Manager would have overall responsibility for on-site waste management. The responsibilities of key roles involved in the proposal are outlined in Table 4.7.

Table 4.7 Roles and responsibilities

Roles	Responsibilities
ACT NOWaste Project Manager	Ensure the instruction of ACT NOWaste staff and contractor(s), implementation and overseeing of the WMP during induction processes.
Contractor Project Manager	Engage qualified waste service contractors(s) according to the ACT NOWaste requirements. Ensure the instruction of contractor staff, subcontractor(s) and visitors, implementation and overseeing of the WMP during induction processes.

Roles	Responsibilities
Contractor Site Manager	Operation and general maintenance of waste equipment (bins) and storage areas. Keep records of quantities of waste and recycled materials disposed of, and the destinations of these materials as discussed in Section 4.3.5. Provide training and induction to all its personnel including subcontractors or delegate the responsibility to a qualified staff, e.g. HSE Advisor.
Contractor HSE Advisor	Ensure waste are collected and transferred to the central collection points on a regular basis. Litter management.
All Contractor Staff and Subcontractors	Waste separation and correct disposal. Ensure rubbish is not littered outside bins or left unattended.
Waste service contractor(s)	The collection of waste from the collection point(s). Transport of the waste streams off-site for licensed disposal or further processing/recycling. Waste monitoring, reporting and audits (if required).

5. Operational phase

5.1 Waste and product quantities

5.1.1 Feedstock contaminants

At the allowable contamination rate of 3%, it is expected that up to 2,100 tonnes of feedstock contaminants would need to be managed per year.

Common FOGO feedstock contaminants (Rawtec, 2020) include:

- Plastic
- All other organics (leather, rubber and oils)
- Containerised food
- Metals
- Other miscellaneous

5.1.2 Operational workers waste

Estimation factors for operational workers waste has been estimated using the factors from Table A5.1 of the ACT Government *Development Control Code – For Best Practice Waste Management in the ACT 2019* which are shown below in Table 5.1.

Table 5.1 Operational waste and recycling generation rates

Premises type	Waste (L/100 m ² /day)	Recycling (L/100 m ² /day)
Office	20	25

It is assumed that the majority of operational workers waste would be produced at the admin area and this footprint has been used to calculate waste and recycling rates as shown below in Table 5.2.

Table 5.2 Annual waste generation

Building	Premises type	Area (m ²) ¹	Waste per year (m ³)	Recycling per year (m ³)
Admin	Office	517	30	37

Waste would be managed by the operator who would engage a private waste contractor to collect and transport the waste off-site for disposal or reuse.

5.1.3 FOGO-derived products

At full scale operation, the facility would produce approximately 28,000 tonnes per year of FOGO-derived products to AS 4454-2012 Composts, soil conditioners and mulches (Standards Australia, 2012) (and possibly other standards). The products would include mulch, compost and soil conditioners and the product mix would depend on market requirements.

Sampling and testing of the product material to confirm compliance with AS 4454-2012 (and possibly other standards) would be undertaken prior to export off-site.

5.1.4 Summary

A summary of the expected operational facility inputs, outputs and wastes is shown below in Table 5.3.

¹ Areas are from Drawing A101 – designed area

Table 5.3 Material summary

Material stream	Waste classification if applicable	Annual waste quantity	Storage	Potential destination	End use
Inputs					
FOGO feedstock	General solid waste (non-putrescible/putrescible)	70,000 t	Enclosed concrete bay (within receival hall)	-	-
Feedstock contaminants	General solid waste (non-putrescible/putrescible)	2,100 t	Enclosed skip bin (within receival hall)	Mugga Lane RMC	Landfilled/Recycled
Outputs					
FOGO-derived products (mulch, compost, soil conditioner)	-	28,000 t	Enclosed concrete bay (within maturation building); semi-enclosed hardstand area (within product storage shed)	Various	Landscaping/soil conditioning
Residual waste					
Operational workers waste	General solid waste (putrescible / non-putrescible)	30 m ³	Skip bins (within/adjacent to administration building)	Mugga Lane RMC	Landfilled/Recycled
Operational workers recyclables	General solid waste (non-putrescible)	37 m ³	Skip bins (within/adjacent to administration building)	Mugga Lane RMC	Recycled
Batteries	Hazardous waste	Nominal	Segregated area on-site (within administration building)	Mugga Lane RMC	Landfilled/recycled
Cleaning products (e.g. lubricants, oils)	Liquid waste	Nominal	Bunded area (within machinery shed)	Cleanaway	Disposed/recycled
Process water/leachate	Liquid waste	Nominal	Temporarily stored in a tank (within maturation building)	Reused on-site	Recycled on-site
Sewerage	Liquid waste	Nominal	-	Sewer	Disposed

5.2 Waste handling and management

5.2.1 Approach to waste minimisation and re-use

All waste generated during operation would be managed using the waste hierarchy approach of avoidance and re-use before consideration is given to disposal. Operational waste generated by staff would be source separated to recover recyclable materials and divert wastes from landfill. Process waste including wastewater would be reduced as far as practicable through on-site treatment and re-use in processing activities.

All wastes would be managed in accordance with the waste provisions contained within relevant legislative and policy requirements.

Should waste be found to be unsuitable for re-use or recycling, disposal methods would be selected based on the classification of the waste material in accordance with the 'Environmental Standards: Assessment and Classification of Liquid and Non-Liquid Wastes 2021' (ACT Government, 2021).

5.2.2 Waste storage locations

Waste generated by operational staff would be stored in interim waste receptacles strategically located throughout the office area and workshop and in communal areas for source separation of garbage (general waste) and comingled recyclables. Recycling stations throughout the offices would promote further source separation of plastics and paper and cardboard. The cleaning contractor would empty the receptacles at the end of the day and transfer the waste to a waste bin storage area to await collection. The source separated waste streams would be segregated and placed into appropriate bins.

Incoming FOGO feedstock would be stored at the receivals hall with the maximum capacity for three days storage (550 tonnes).

Contaminated material from processing would be stored at the receival hall and the maximum storage volumes would nominally be 50 cubic metres. Where possible the material would be separated to allow recovery of recyclable materials. Figure 5.1 provides the indicative storage bay area for feedstock contamination within the receival hall. The receival hall would have a minimum height of nine metres and be mostly flat with gradient less than one degree.

Adequate signage identifying the waste storage area would be prominently displayed. All waste receptacles would be clearly and correctly labelled to identify which materials are to be placed in which bin and colour-coded in accordance with the AS 4123: Mobile Garbage Containers (Standards Australia, 2006).

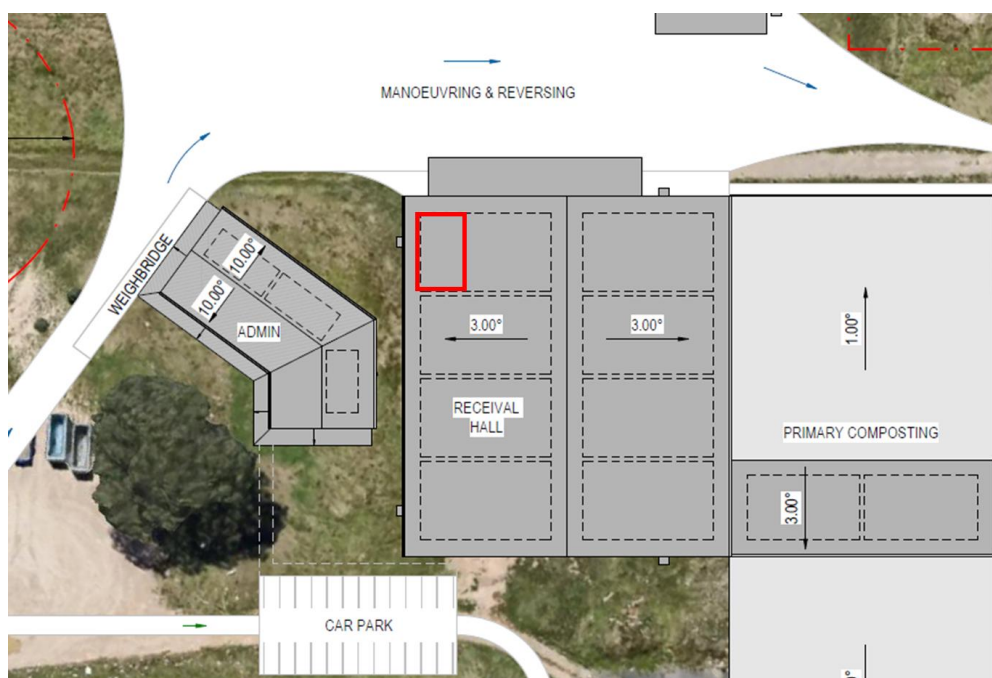


Figure 5.1 Contaminated material storage area (indicative only)

5.2.3 Waste recycling and disposal

The proposed recycling and disposal measures for operational waste are listed in Table 5.4. This table also outlines the contingency measures (disposal) for wastes and residues that cannot be avoided, re-used, recycled or treated. The final destinations for all off-site recycling and disposal would be confirmed prior to operations commencing and updated throughout the life of the facility based on the availability of suitably licensed facilities.

Table 5.4 Potential off-site recycling and disposal options – operation

Waste	Hierarchy	Management measures	Recycling/disposal options
Food waste	Dispose	General waste materials would be collected and transferred off-site to a licenced waste management facility	Licenced sites such as Mugga Lane RMC

Waste	Hierarchy	Management measures	Recycling/disposal options
General waste	Dispose	General waste materials would be collected and transferred off-site to a licenced waste management facility	Licensed landfill sites such as Mugga Lane RMC
Recyclable materials	Recycle	Recyclable materials generated by the office and administration system would be source separated and transferred off-site to licensed recycling facilities	Recycling facility such as Mugga Lane RMC
Feedstock contaminants	Recycle	Recyclable materials to be separated where possible and transferred off-site to licensed recycling facilities	Licensed landfill and recycling sites such as Mugga Lane RMC
	Dispose	General waste materials would be collected and transferred off-site to a licenced waste management facility	
Batteries	Dispose	A licenced waste contractor would be engaged for collection and disposal of batteries	Licensed landfill and recycling sites such as Mugga Lane RMC
Sewage	Dispose	Sewage from offices and amenities would be discharged to sewer	Discharged to sewer
Cleaning products (e.g. lubricants, oils)	Dispose	General waste materials would be collected and transferred off-site to a licenced liquid waste management facility	Licensed liquid waste management facility
Process wastewater/leachate	Reduce/reuse	Process wastewater/leachate generated from the FOGO facility would be collected in the tunnels and reused in the process	Reuse on-site

5.2.4 Contingency management

Management measures and procedures would be developed for the facility to provide contingencies for events such as:

- Oversupply of waste received on-site.
- Stockpiling of waste when/if the operation of the facility is ceased or reduced in capacity.
- Other processing disruptions at the facility.

The facility would be designed to accommodate weekly, monthly and seasonal variations in feedstock quantities and characteristics and the current design would allow a minimum of two days' storage capacity. The feedstock deliveries would only occur daily from Monday to Friday, with occasional processing on weekends, which would reduce the chance of backlog of material if there were any processing disruption. Planned and unplanned works including repairs and maintenance would be able to be carried out during weekends to ensure a high level of processing continuity assurance and reduce the risk of stockpiling from oversupply or backlog of material.

If more than three days' worth of deliveries were accumulated, contingency measures may need to be implemented to reduce the potential environmental impacts associated with extended accumulation of material (i.e. odour and leachate). These would include diverting material to an alternative facility, or to landfill. Use of an alternative facility may depend upon a prior contractual agreement being in place. This would be considered in contingency management for the facility.

5.3 Waste tracking, record keeping and quality control

Specifications for feedstock materials would be developed as part of commercial agreements with feedstock suppliers to ensure materials received at the FOGO facility are suitable (conforming). All incoming loads would be visually inspected upon unloading and before being moved immediately into designated storage pens.

Non-conforming wastes would include contaminated loads with greater than 3% of contaminants. Small quantities of impurities such as plastics, other organics, containerized foods and metals etc are expected to be received and

feedstock containing these impurities would not constitute a non-conforming load as they would be able to be handled by the sorting and separation processes.

Where a non-conforming load is identified during the initial visual inspection, the load would not be unloaded. If some of the material has been unloaded when it is identified as non-conforming, it would be reloaded onto the vehicle it was delivered in and the full load would be rejected. Records of the date, time, vehicle and reasons for load rejection would be maintained.

The quality control measures proposed during operation to track incoming waste and outgoing products and ensure the quality of outgoing products are listed in Table 5.5.

Table 5.5 *Quality control, record keeping and waste tracking measures*

Aspect	Measures
Signage at entrance	Signage at the entrance clearly identifying the permitted waste/feedstock types and non-conforming waste types.
Specifications for FOGO material	Agreed specifications for feedstock materials to control the risk of receiving non-conforming materials.
Rejected loads (non-conforming waste) register	Maintenance of a rejected loads register – including records of date, time of load rejected, registration of vehicle(s), type of waste(s) rejected and reason for rejection.
Feedstock and output/product storage	Labelling or signposting of incoming feedstock and outgoing product storage areas in a way which is clearly visible. Separation/segregation of individual separated output/product types.
Inspections	Daily inspections by trained staff of incoming and outgoing waste storage areas to ensure storage is being undertaken in accordance with the operations plan for stockpile management and implementation of any required corrections immediately. Maintenance of inspection records.
Training	Training of staff in roles which require visual inspection of loads. Maintenance of training records.
Specifications, sampling and testing of product material	Where applicable, development of specifications, sampling and testing procedures in conjunction with product/recovery stream customers.
Incoming and outgoing waste/product records	Accurate recording of all incoming and outgoing (waste and product outputs) using weighbridge data in accordance with the record keeping requirements of the Environment authorisation for the facility.

6. References

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