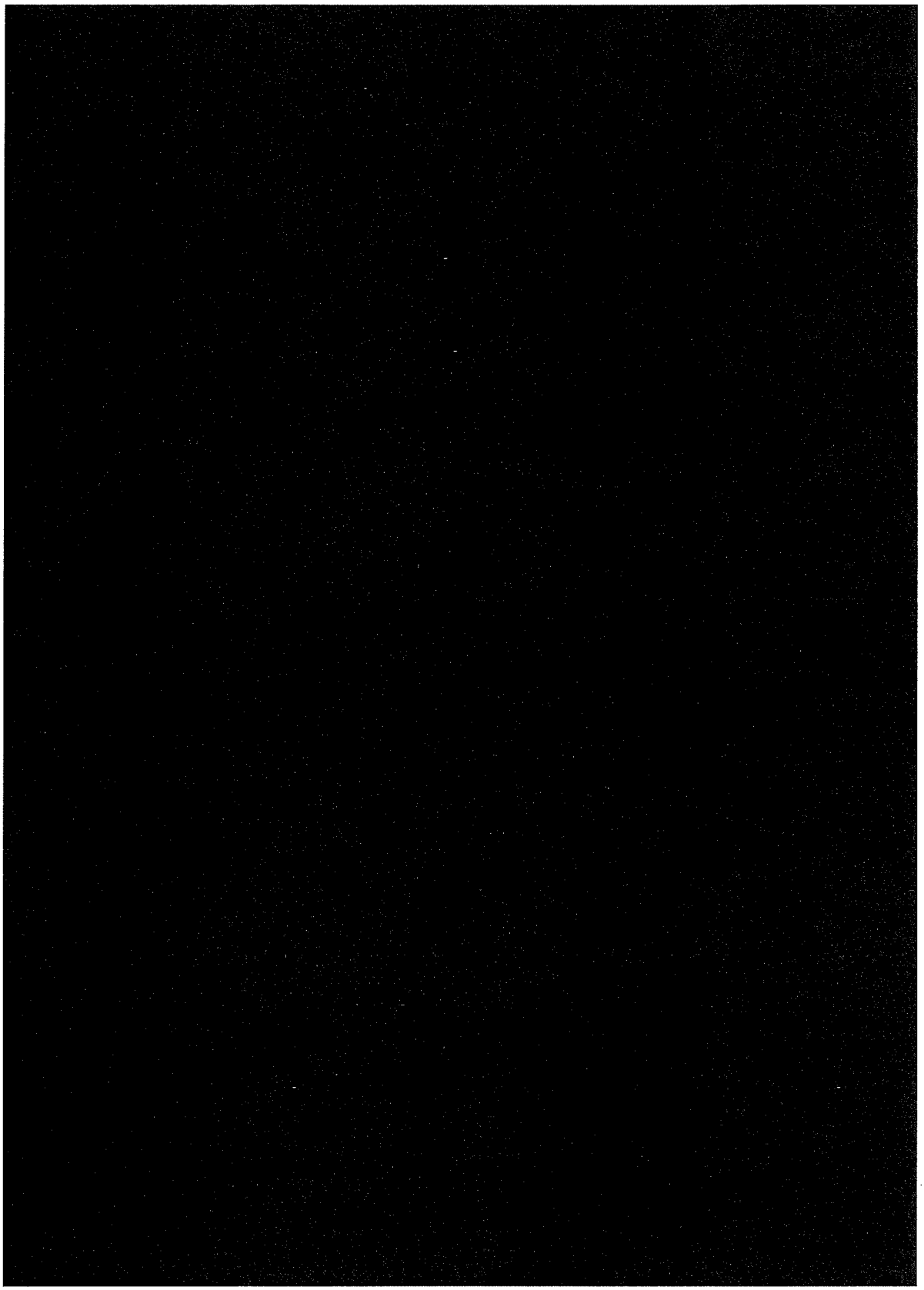


6.4 Recommended Delivery Model

From the outcomes of the MCA process, a **DCMO** and a **User Charge PPP** are the preferred Delivery Models for the FOGO facility. A qualitative assessment of both models has been undertaken, taking into consideration the benefits of each model, the outcomes of the soft market sounding and preliminary consultation with stakeholders. This included stakeholders within ACT NoWaste, ACT Treasury and Major Projects Canberra, and Arup/Sphere's knowledge of the organics and waste infrastructure market.

Delivery Model	Benefits	Disadvantages
DCMO	• Significant level of risk can be transferred to contractor. • Attracts a larger number of bidders who do not need to bring their own financing (maximises competitive tension). • There are significant potential interface risks between design and operation for FOGO processing and the ACT government is not well placed to manage these risks. The DCMO delivery model places responsibility with the contractor for managing this interface to achieve good long-term operational performance. Good operational performance substantially controls potential environmental and amenity risks, which are of high importance to the ACT. • Allows realisation of efficiency and reduced interface risks by dealing with a single contractor; incentivises for whole-of-life cost savings for maintenance and operations • There are significant commercial risks involved in establishing market outlets for the recovered compost product and the ACT government has limited ability	• ACT has limited input into design, build and long-term operations once contractual arrangements are finalised with contractor. • ACT funds the project (may be a benefit or a risk depending on competing capital commitments) • Can take longer to structure, document (i.e. contracts, RFP documents, etc.), negotiate and procure than traditional models, but generally less time than a PPP given private debt and equity finance would not need to be raised and associated diligence and contracting activities would not need to be undertaken.

From this, both models were identified as suitable for this project. Given the similarity in the MCA analysis outcomes between both models, we included an analysis of both in the Business Case

A further market sounding was conducted in November – December 2021 in partnership with ACT Treasury (Infrastructure Finance & Reform unit) to help with the selection of an appropriate delivery model. The outcomes of this are contained in Appendix K – Delivery Model Market Sounding Report.

Following the conclusion of the further market sounding, a DCMO delivery model was recommended and confirmed by the Infrastructure Finance & Reform unit as being appropriate for the subject project.

Service and quality standards for the operations of the facility will be agreed as part of the procurement process.

6.4.1. Food Waste for Healthy Soils Fund

As part of the 2021-22 federal budget, the Australian Government has committed $67 million to a new Food Waste for Healthy Soils Fund. Out of this $67 million, $57 million will be allocated for infrastructure to support new and improved organic waste recycling infrastructure to divert FOGO waste from landfill over the next four years. The application for funding closes in March 2022.

Considering the opportunity to secure Commonwealth fund, this business case proposes a DCMO delivery model. This involves a portion of funding from the Commonwealth (up to 1/3), with matched funding by the ACT Government and the remaining balance either funded by the DCMO contractor or by the ACT Government. There should be an assurance of the balance of funding from the ACT Government before an application is lodged for the fund by March 2022. Failing to secure a contribution from the Fund , or via the DCMO contractor, will require the ACT Government to finance the entire delivery of the FOGO facility through a DCMO model. As such, the mid-year business case requests funding for the entire facility with a confirmation of final funding required following the Fund application process and DCMO tender.

6.5 Review 3 (IFCW): Delivery Model Selection

IFCW directorate to sign off that the delivery model selected is appropriate for the project risk profile and value. Review 3 (IFCW) Officer Name: _____ Signature: _____ Date: _____

- *This is the second review point for IFCW and is an assessment of the delivery model analysis.*

7. Financial Analysis

This section outlines the financial analysis undertaken on delivering the project through a DCMO model, as well as via traditional procurement.

While PPP and DCMO have both been identified as suitable delivery models, at this stage of analysis it is not possible to comment in more granular detail on the relative impact to risk quantification under each model, and therefore a quantitative analysis that compares the two options is likely to be misleading. To demonstrate the potential cost of a private sector delivery model vs. traditional government procurement, the analysis in this chapter focuses on how the outcomes under DCMO procurement contrast with those under traditional government procurement only.

The following chapter outlines:

- General model assumptions
- Proposed risk allocation under DCMO
- DCMO payments to contractor and project revenues received from the sale of compost, in present value terms
- Net present costs to government if delivered through a traditional procurement method (the Public Sector Comparator, or PSC), and
- Cost to Government.

The aim of the financial analysis is to (1) determine the relative cost to ACT of different delivery models and (2) for each model determine the impact on government budgets by analysing the net cashflow of the project.

7.1 Delivery Model Structure

It is expected that the most likely structure of a DCMO would involve Government paying a Contractor to construct and operate the site, and the [redacted] that is calculated to cover costs to achieve the required return of the Contractor. [redacted]

This model is outlined in the diagram below.

seeking to reduce costs in other areas (without impacting service quality or breaching contractual obligations) or by accepting a lower profit margin.

Discount rate

Two separate discounts rates have been applied in this business case:

- Financial discount rate – In accordance with the *National PPP Guidelines Volume 5 Discount Rate Methodology,* separate discount rates have been determined for (a) the DCMO model, and (b) traditional government procurement. The traditional government procurement model uses the 10-year ACT Government bond rate (the Territory's risk free rate, with duration aligned as close as possible to the average life of the project), whilst the DCMO model uses a discount rate equivalent to the risk free rate plus the portion of the systematic risk premium transferred to the private sector.
- Economic discount rate – This discount rate is applied in the cost benefit analysis and is often referred to as the 'social discount rate'. This rate seeks to adjust for social time preference, defined as the value that society attaches to the present rather than future consumption. In the ACT, this rate is set at [redacted] This discount rate is applied to real cashflows.

In the financial analysis, analysis of the DCMO model and traditional procurement sees the application of different discount rates to project cashflows to determine the project's net present value. Under the traditional government procurement model, the risk-free rate, the 10-year ACT Government bond rate (currently 1.97%), is used as the discount rate given that predominately all the systematic risks are borne by the public sector. Under the DCMO model, where systematic risks are shared between the public and private sectors, the systematic risk premium transferred to private sector needs to be determined to calculate the discount rate.

To enable the identification of the proportion of systematic risk borne by the parties under a DCMO model, and allocate the systematic risk premium, a two-stage process was undertaken:

- Assessment of the relative importance of each of the systematic risks which included demand, inflation, asset residual value and downturn in broader market; and
- Assessment of how the risk would be allocated between the parties.

In line with the *National PPP Guidelines*, Table 39 shows the weightings and allocation of risk applied to each systematic risk in order to determine the premium transferred to the private sector. In relation to the weighting scale, a '1' represents low importance based on impact upon project cash flow and '5' being of high importance. For the allocation of risk, '0' means the risk is with public sector, '1' is with private sector and '0.5' means it is shared between the two parties.

premium is derived by multiplying the market risk premium with asset beta. The market risk premium is assumed at [redacted] per the National PPP guidelines. In terms of the asset beta, research was undertaken on observable betas for listed waste management corporations on the Australian Stock Exchange with comparable expertise and services. Unlevered beta values for the identified comparable companies are shown in Table 42 and the average beta of [redacted] was used in forming the total systematic risk premium. Therefore, the systematic risk premium as applied was [redacted]

Table 43: Comparable betas

[redacted]

As shown in Table 43, to determine the systematic risk premium transferred to the private sector, the allocation of risk is multiplied to the estimated portion of systematic risk premium. Ultimately, the discount rate for DCMO is the sum of the systematic risk premium transferred to private sector [redacted] and the 10yr ACT Government bond rate [redacted] resulting in a discount rate to be applied to Government cash flows under the DCMO model of [redacted]

The following table outlines general model assumptions such as timeline, inflation, discount rate and revenue assumptions. Detailed assumptions for preliminary costs and contingencies are outlined in Section 4.

Table 44: General model assumptions

Item	Parameter	Source
Timeline	Development period: 01 Jan 2022 to 31 July 2023 Construction period: 01 Aug 2023 to 30 Jul 2024 Operational period: 01 Aug 2024 to 30 Jul 2044 (20-year operational period)	Assumption
CPI	[redacted] p.a.	Average of June 2021, 2022 and 2023 CPI forecast: *Reserve*

7.3 Pre risk adjusted financial outcomes

This section outlines the financial outcomes of the project, where forecast cash flows (excluding risk adjustment, depending on delivery model) is estimated for each project option. The project cash flow consists of the estimated capital and recurrent costs.

Assuming a discount rate of [redacted] (10-year ACT government bond rate), the net present value (NPV) of project cash flow is shown in Table 45. The cash flow in present value terms for the first full year of operations (FY2026) is summarised in Table 46.

Table 45: NPV Project cash flows

NPV Project cash flows	Value ($, Discounted)
Capital Costs	
Development and construction CAPEX	[redacted]
Major maintenance CAPEX	[redacted]
Recurrent Costs	[redacted]
NPV	[redacted]

Table 46: NPV cash flow for first full year of operations

NPV Cash flows for first full year of operations FY 2026	Value ($, Discounted)
NPV	[redacted]

The following graph shows the net cashflow in nominal terms during the development and construction phase, and the operational period of 20 years. The development and construction phase occurs from FY2023 to FY2025. The increase in cash outflows in FY2033 results from major maintenance costs being incurred in that year.

Sensitivity	NPV Project cash flows
Operating costs -20%	[redacted]
Revenue +20%	[redacted]
Revenue -20%	[redacted]

7.3.1. Compost revenue

Compost products encompass a wide variety of applications, with different material blends, quality and price-points being acceptable in different applications. Compost itself can be produced to a variety of particle sizes, biological maturities and chemical and physical contamination levels. It can also be blended with inert materials such as sands and soils to vary the texture, and natural or synthetic fertilisers to change the nutrient content and chemical properties. Compost producers vary the quality and blending of their products to suit market demand. Product selection, finishing and marketing will remain at the discretion of the contractor, and will not be prescribed or controlled through the DCMO contracting arrangements. Market dynamics for compost-based products are characterised by:

- Non-linear elasticity between price and demand: Producers cannot necessarily generate significant additional demand by lowering prices.
- Trust-based supply chains: Given potential for variability between compost products, establishing reputation and trust within the supply chains is important for individual producers, particularly those targeting premium quality outlets. This has been done very successfully by some composters, including incumbent operators in the ACT.
- Immature potential markets in potential agricultural applications: It can be challenging to develop a new customer base in market segments where there is limited understanding of the expected compost benefits and the product characteristics needed to deliver them, or which have past experience with compost products which were not fit for purpose.

This combination of market dynamics and operator discretion means that there is uncertainty in the likely price-point and target markets for the recovered organic products based on household FOGO material. The approach within the business case is to adopt a highly conservative, but non-zero, value of [redacted] for compost revenue.

Table 49 summarises three distinct market segments for compost-based products, and the primary uses for compost products within each one. The volume, price, quality and physical specifications differ between specific uses, and composters typically produce multiple product grades targeting different outlets. Product which are sold in low volumes, such as bagged landscaping products for domestic gardens, command a higher price point per-tonne than bulk sales outlets, but provide a potentially more constrained volume outlet.

Canberra green waste composters and CRJO FOGO composting.	Self-haul retail price $/m³	$/tonne based on an approximate compost density of 0.4 tonnes/m³
Corkhill Bros organic compost/super compost	$ 44	$110
Canberra sand and gravel compost soil	$ 46	$115
Canberra sand and gravel Compost No. 5	$ 48	$120
Weilwun veggie mix	$ 45	$113
Weilwun organic fine compost	$ 35	$88
Weilwun organic coarse compost	$ 25	$ 63

As can be seen from Table 50 , the [redacted]/tonne value adopted for compost revenue is highly conservative when compared to the incumbent operators in the urban amenity market in ACT and CRJO region. The market price achieved has the potential to be considerably more than [redacted]/tonne based on sales figures from other projects, but the ACT FOGO product would need to compete with established suppliers in the existing ACT urban amenity market, and it cannot be guaranteed that the full volume of FOGO compost product will be sold within that market and price range. The potential need to diversify into less urban amenity applications or agricultural markets, when specific local information is unavailable creates some uncertainty, and the revenue estimate has been reduced accordingly.

Tender proposals including an incumbent operator may be able to base their offer on a higher expected revenue due to existing supply chains and relationships which help to mitigate risk in this space. However, this has been discounted at the business case stage to provide a conservative overall assessment of project funding requirements.

Figure 15 shows the risk-adjusted cash flows in nominal terms.

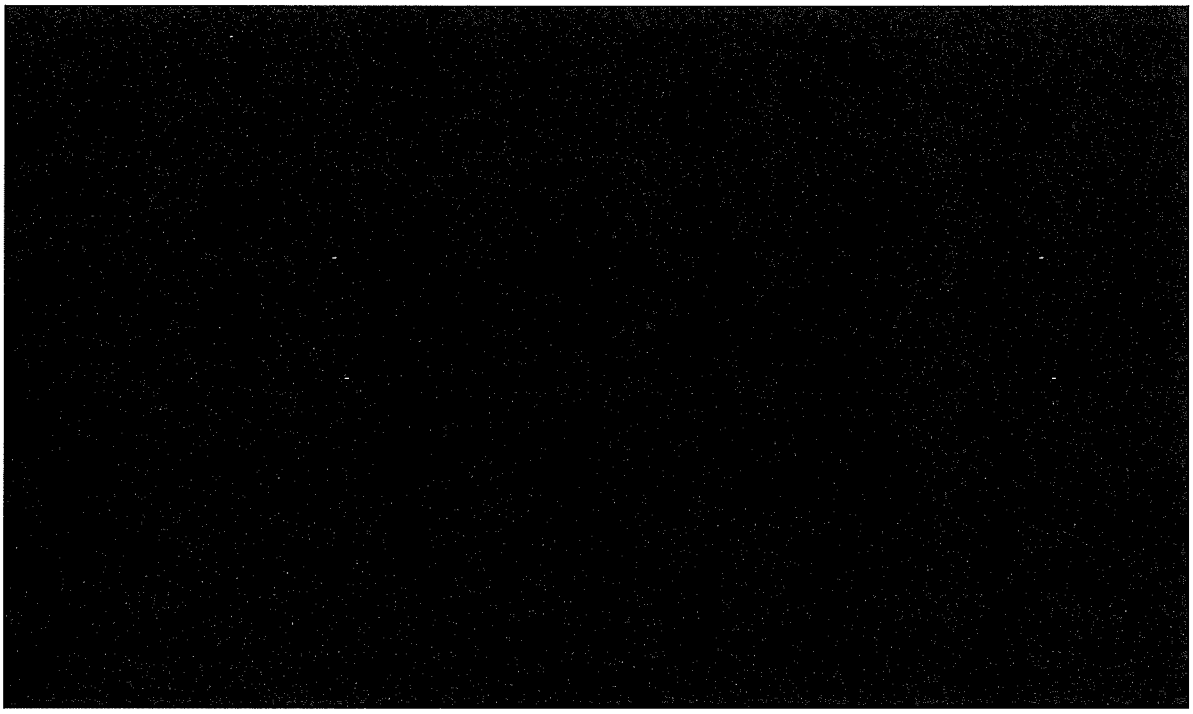


Figure 15: DCMO Nominal risk-adjusted cash flows

The first full year of operations in the financial model is in FY2026. The following table shows the nominal cash inflows and outflows for that year. The nominal cost to government in the first full year of operations is [redacted]

Table 52: Nominal costs in the first full year of operations

Nominal costs in first full year of operations (FY2026)	Value ($, Nominal)
Risk-adjusted recurrent costs to government	[redacted]

7.5 Incremental Procurement/Transaction Costs

The illustrative private sector delivery model for this project, DCMO, requires significant government effort during the procurement period. Given that the terms of the awarded contract will be relatively fixed for the entire operational period under DCMO, it is important that the Government fully understands the risks and potential costs, and associated contract structure. To do so, it is likely that legal, technical, and commercial advisors will be required during procurement. The procurement and transaction costs included in the project costs are detailed in Section 4.2.1.

7.6 Public Sector Comparator vs. DCMO

Figure 16: Financial Analysis

7.7 Review 4 (Treasury): Financial (PPP/DCMO only)

☐ Not applicable

Treasury to sign off that the financial analysis has been prepared by an appropriately skilled advisor (IFCW Panel) and that there are no unacceptable assumptions in the analysis (only applicable for PPP/DCMO delivery models).
Review 4 (Treasury) Officer Name: _____
Signature: _____
Date: _____

- *This is the second review point for Treasury and is an assessment of the financial estimate calculations for PPP and DCMO models.*

Disclaimer: *This review does not represent an endorsement or agreement by the signing officer as to the contents of the section or a certification that the work was correctly performed.*

Stakeholder	Interest and Role	
	Provides input to the Steering Committee where required.	
Advisors	Engaged on an as required basis. Provide specialised/technical input to the Steering Committee where required.	Relevant advisors – ACT NoWaste External consultancy – Arup Australia Pty Ltd Current Green Waste processor for Trial Data WorkSafe, ACT ESA and ACT EPA and EPSDD MPC / TCCS ID Any other External SMEs identified and required to deliver the project.
Project Control Group		
Project team	Made up of officers from both the Requesting Directorate and PCW. Team members will ideally have subject matter, project management and contracts management experience. Responsible for: • Develop positions on a range of policy, commercial and administrative matters to be considered by the steering committee. • Manage the advisors to ensure satisfactory performance, deliverables are achieved. • Manage the competitive bid process. • Manage stakeholder relations and community consultation. • Provide advice and assistance to the evaluation committee on its assessment of expressions of interest and binding bids. • Manage contract administration • Monitor project programme • Progress invoices & maintain budgets	Project Director – ACT NoWaste, TCCS Project Manager,Infrastructure Delivery, TCCS Senior Project Officer, MPC

Figure 17: FOGO Governance Structure

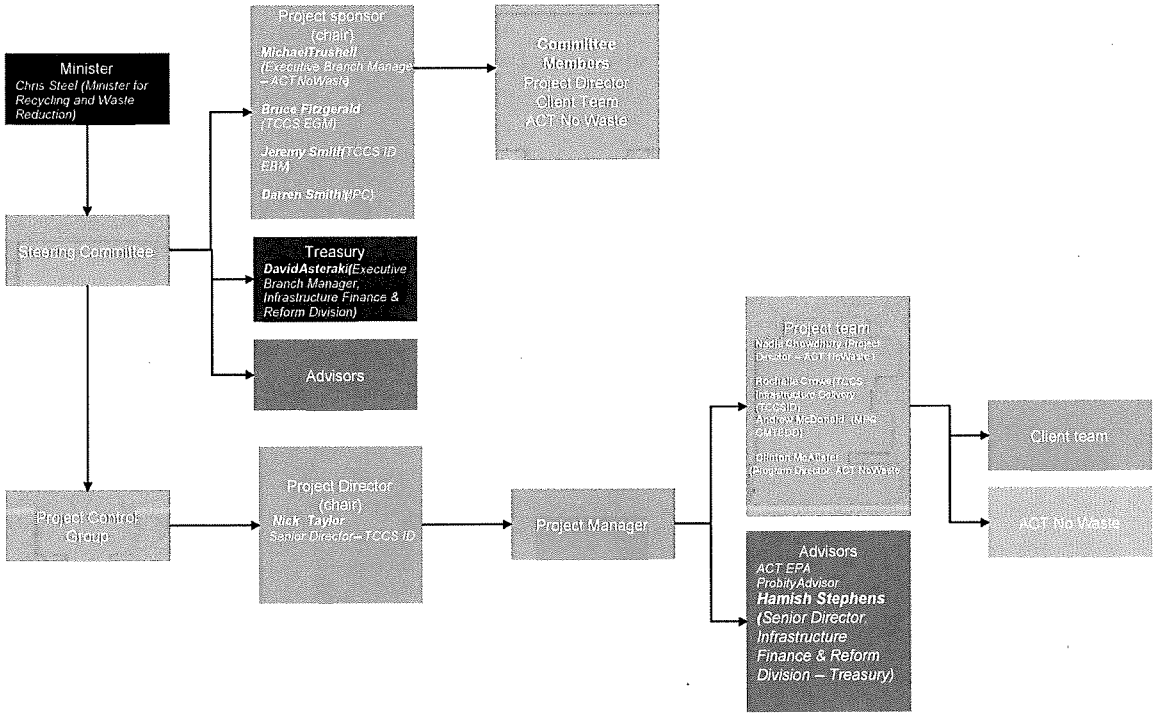


Table 55: Stakeholder identification and consultation

Stakeholder	Impact and interest on the project	Consultation to date	Planned consultation
ACT NoWaste	Project Sponsor	-	-
ACT Treasury	Manages the process through which of capital works funding proposals in the ACT are assessed.	Engagement in each of the Directions Paper, Feasibility Study and Business Case stages of the project, particularly in respect of delivery model selection. Treasury has had a key role in the development of the funding and delivery model selection, attending the risk and delivery model workshop.	Ongoing engagement and consultation throughout the business case process, and final approval of the budget for project delivery. Treasury will also review and approve the business case for the consolidated waste collection services contract, including FOGO collection. This is a separate contract and business case, but both the collection and processing of FOGO material are interdependent and essential to the overall resource recovery objective.
Major Projects Canberra (MPC)	Leads the procurement and delivery of the Territory's infrastructure program in partnership with	Participation in various workshops during the Directions Paper, Feasibility Study and Business Case stages of the project.	MPC will lead the procurement and delivery of the FOGO infrastructure project, including development of tender and contract document, tender evaluation and project oversight during the design and construction phases.

Stakeholder	Impact and interest on the project	Consultation to date	Planned consultation
Potential bidders	Potential delivery partners to the Territory	Informal / soft market sounding to ascertain market appetite; available technology; risks; preferred delivery models. Findings were anonymised and incorporated into the FOGO Feasibility Study.	Invitation to bid in accordance with the procurement guidelines.
Local community	Key stakeholders in the success of the FOGO facility. Community education and engagement is essential to ensure volumes and quality of feedstock.	Market surveys and engagement to understand broader level of food waste and interest in composting.	Education and engagement prior to rolling out the FOGO facility. Education and engagement are included in the waste collection business case and will be delivered using a combination of in-house ACT resource and contractor resources under the waste collection contract. Education engagement will take place at the end of 2021 prior the FOGO trial and will be refined and expanded prior to full rollout of the service across the ACT, including incorporation of specific advice or requirements from the selected FOGO processing provider.
Special interest groups	These are the community groups that will be included in the community reference group. They are likely to be	None.	Community consultation workshops to understand community views towards the delivery of the facility.

Stakeholder	Impact and interest on the project	Consultation to date	Planned consultation
	have a directed working relationship. However, these services will be provided under separate contracts with the ACT Government, and the ACT Government remains responsible for managing the interface between waste collections and waste processing.		FOGO service provision will be explored and the interface between collections and processing will be established.
Indigenous communities	Recognition that the currently proposed site may have cultural significance.	None. The EIS scoping process did not identify any aboriginal cultural heritage values associated with the preferred site.	General community consultation and education materials and distribution will be developed to ensure they are inclusive and accessible across demographics and cultural groups in the ACT, including indigenous communities.
Procurement ACT	Procurement ACT supports the delivery of many capital works projects in the ACT.	Not engaged. ACT NoWaste has engaged with Major Projects Canberra (MPC), as MPC will be the agency supporting delivery of the FOGO infrastructure project.	None. MPC will be the agency supporting delivery of the FOGO infrastructure project.

10. Advisor Engagement Plan

10.1 Proposed Advisors Roles

10.1.1. Legal

Given the complexity of a DCMO, it will be critical that the ACT receives robust legal representation.

Subject to the final selected delivery and procurement model, the ACT will require a legal adviser to review, draft and advise the Territory in relation to the following documentation and process:

1. commercial DCMO term sheet to accompany Request for Proposal ("**RFP**") documents;
2. Project-specific DCMO Contract, including the functional specification requirements for the Project to accompany Request for Tender ("RFT") documents. Note the functional specification will be created by the technical advisors;
3. Any related side deeds relating to the Project and/or DCMO Contract;
4. summary sheets for all contracts.
5. invitation letter and instructions to Bidders, to be prepared in conjunction with the ACT and its advisors.
6. discussion with the ACT and its financial/commercial and technical advisers to incorporate comments on the documents prior to release to the Bidders.

It is beneficial if advisors with experience in both complex infrastructure delivery **and** the waste market are utilised.

The legal adviser will need to ensure it is familiar with, complies with and incorporates into its advice all Territory probity requirements, as well as Treasury and budgetary cycle requirements and processes.

10.1.2. Commercial Procurement

As the recommended Delivery Model is a DCMO, a Commercial Procurement Advisor will be required. Arup will be the Commercial Procurement Advisor alongside Sphere Infrastructure Partners. Additionally, Major Projects Canberra will be a key advisor to ACT NoWaste.

10.1.3. Commercial Financial

As the recommended Delivery Model is a DCMO, a Commercial Financial Advisor will be required. Arup will be the Commercial Procurement Advisor alongside Sphere Infrastructure Partners.

10.1.4. Technical Design & Engineering

A Technical Design and Engineering Advisor will be required for the detailed design stage of this project. Arup are the confirmed and appointed specialist technical advisors.

11. Timeline

11.1 Project Timetable

11.1.1. Outline

The project timeline is broken down into seven key steps, summarised in the table below for the delivery of the FOGO facility through a DCMO Delivery Model. A detailed Project Programme is included in Appendix F.

The proposed timeline is tight and requires the timely completion of key activities and careful and efficient management of various interfacing work streams, such as internal ACT Government approvals of the business case and budget. The timeline proposes the shortest possible timeline for delivery of the facility, with little to no float for resolving any issues around design and construction.

Table 56: Project Timeline (DCMO)

Stage	Key Activities	Timeframe	Notes
Business Case Finalisation	Business Case Finalisation Internal Review of Business Case (ACT NoWaste and Treasury) Cabinet Review Process Approvals - Budget estimates, including allocation for FOGO procurement Further assessment and approvals on delivery model decision based on market sounding outcomes	Q2 2021 – Q3 2023 (9 months)	
Procurement Process	Engage Legal Advisors Preparing RFP request and evaluation criteria RFP application preparation time for bidders(s) RFP Response Period	Q1 2022 – Q1 2023 (13 months)	

	EIS Preparation and submission to EPSDD Public Consultation Response to submission & Update EIS Approval from EPSDD		
Development Application	Approved EIS to be submitted with DA	Q2 2023 – Q3 2023 (2 months)	As above.
Design (by selected bidder)	Detailed Design Approvals (Planning, Environmental etc.)	Q1 2023 – Q3 2023 (6 months)	6 months has been allocated to detailed design, which must be reviewed at tender assessment stage.
Community Education	Community Education prior to operations	Q3 2023 – Q3 2024 (11 months)	
Construction and Commissioning (by selected bidder)	Construction Testing, commissioning, and handover	Q3 2023 – Q3 2024 (11 months)	11 months is allowed for construction, which may require early procurement of key plant and equipment to realise. No allowance has been made for delays to delivery or international supply constraints.

11.1.2. Proposed float

There has been no float allowed for in the development of the timeline to achieve operations by end of 2024. As such, the following issues will need to be addressed:

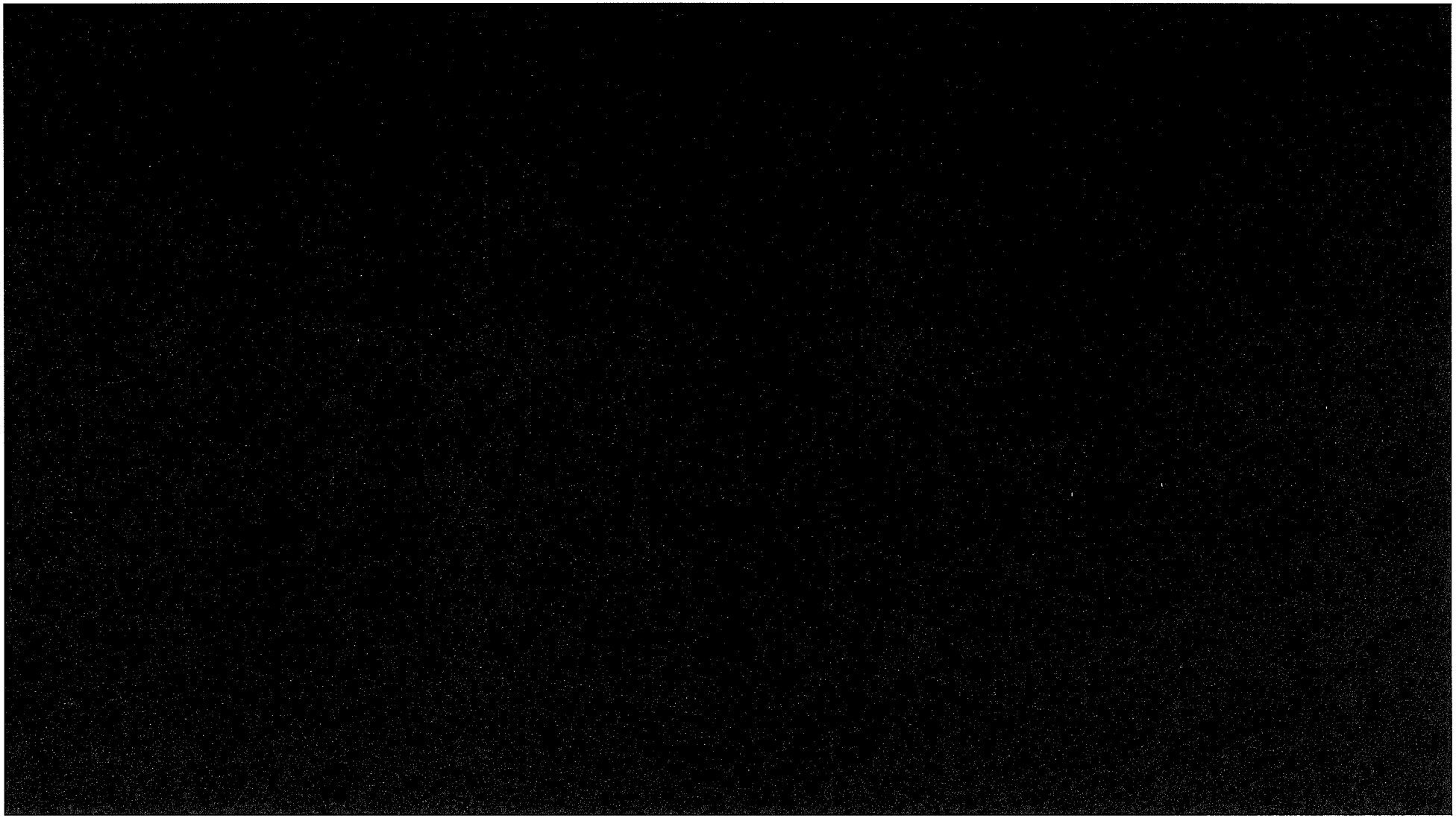
- Timely review of contracts for preferred bidder. No allowance has been made for extended legal negotiations that may occur.
- The EIS process relies upon the overlap of permitting and of development of detailed design. This itself may precipitate late design changes and late stage permit modification. It is assumed that these changes will be minor and can be processed by EPSDD in a timely manner.

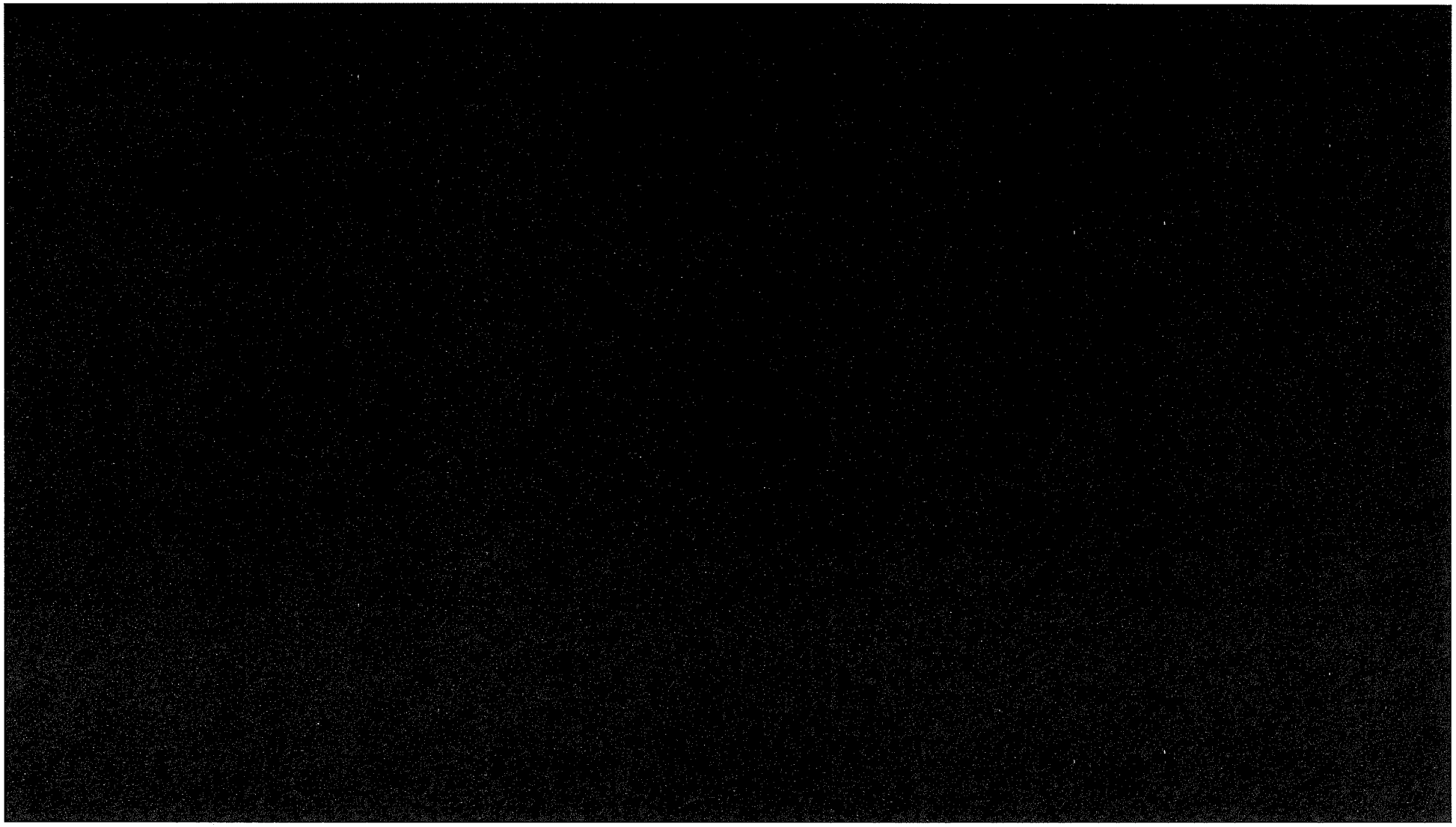
12. Appendices

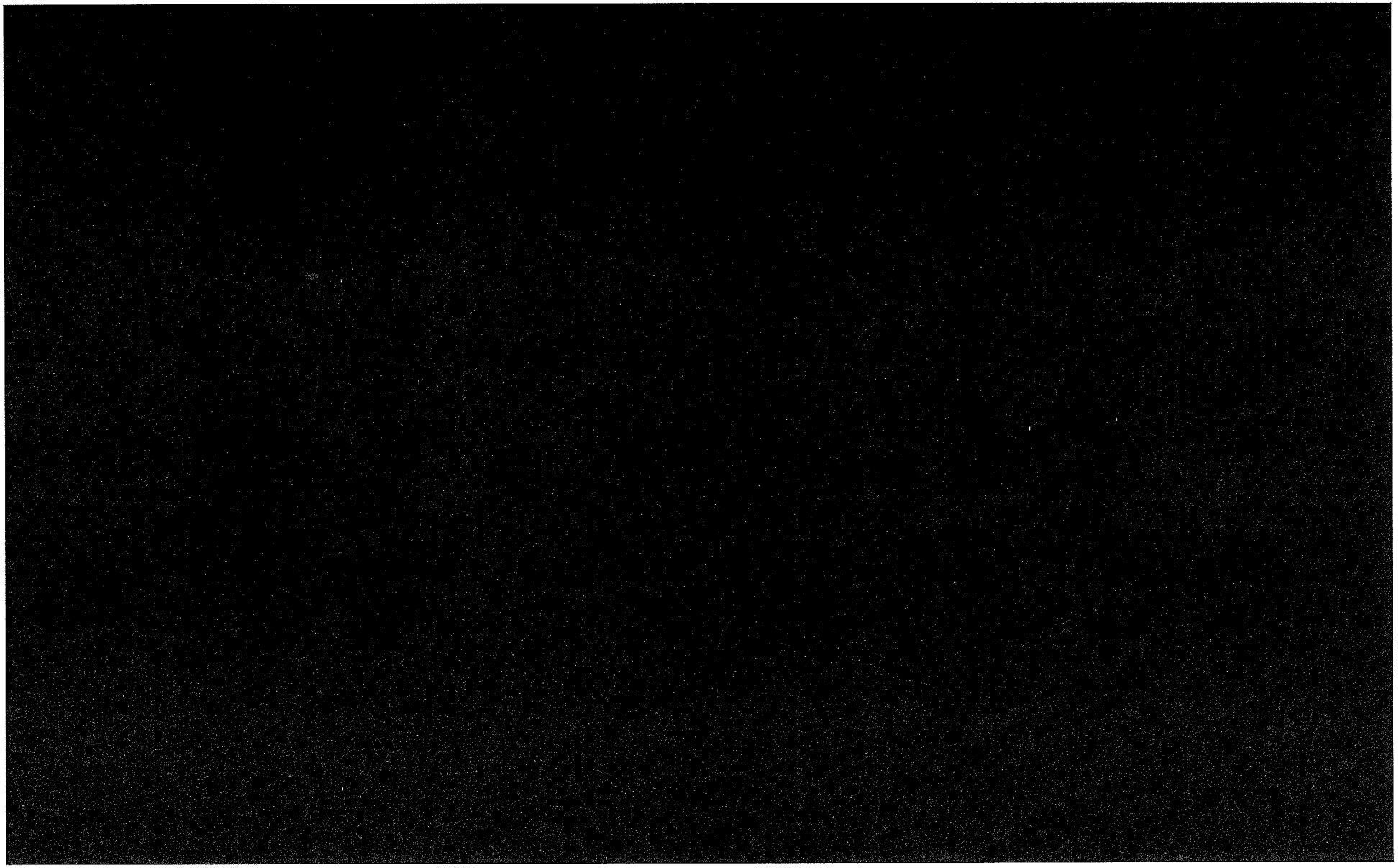
12.1 Appendix A – Functional Brief / Output Specification

The Functional Brief/Output Specification is to be provided by Major Projects Canberra as part of the Procurement Strategy. This will summarise the needs and outcomes that ACT NoWaste is seeking to achieve from the project to assist in the achieving successful outcomes.

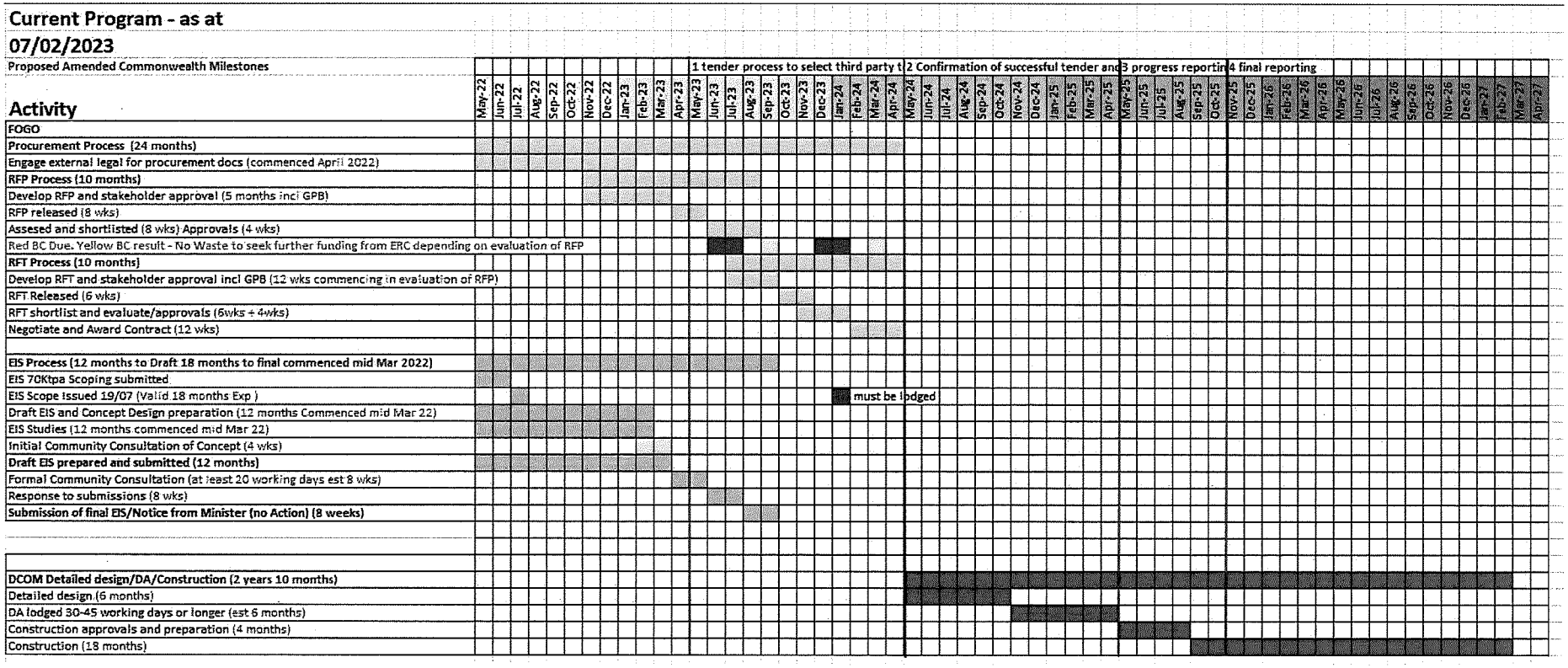
12.3 Appendix C – Risk Register

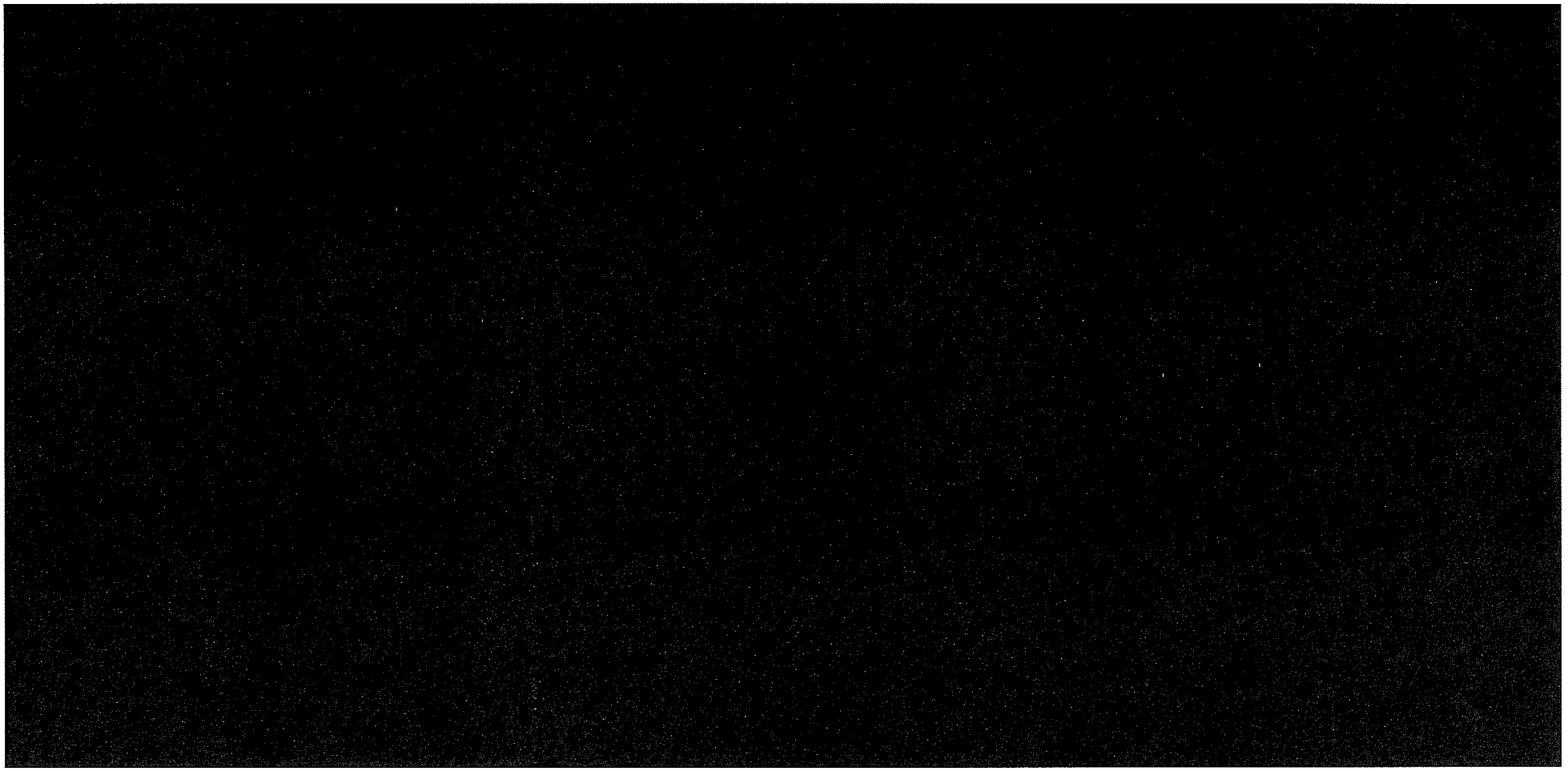


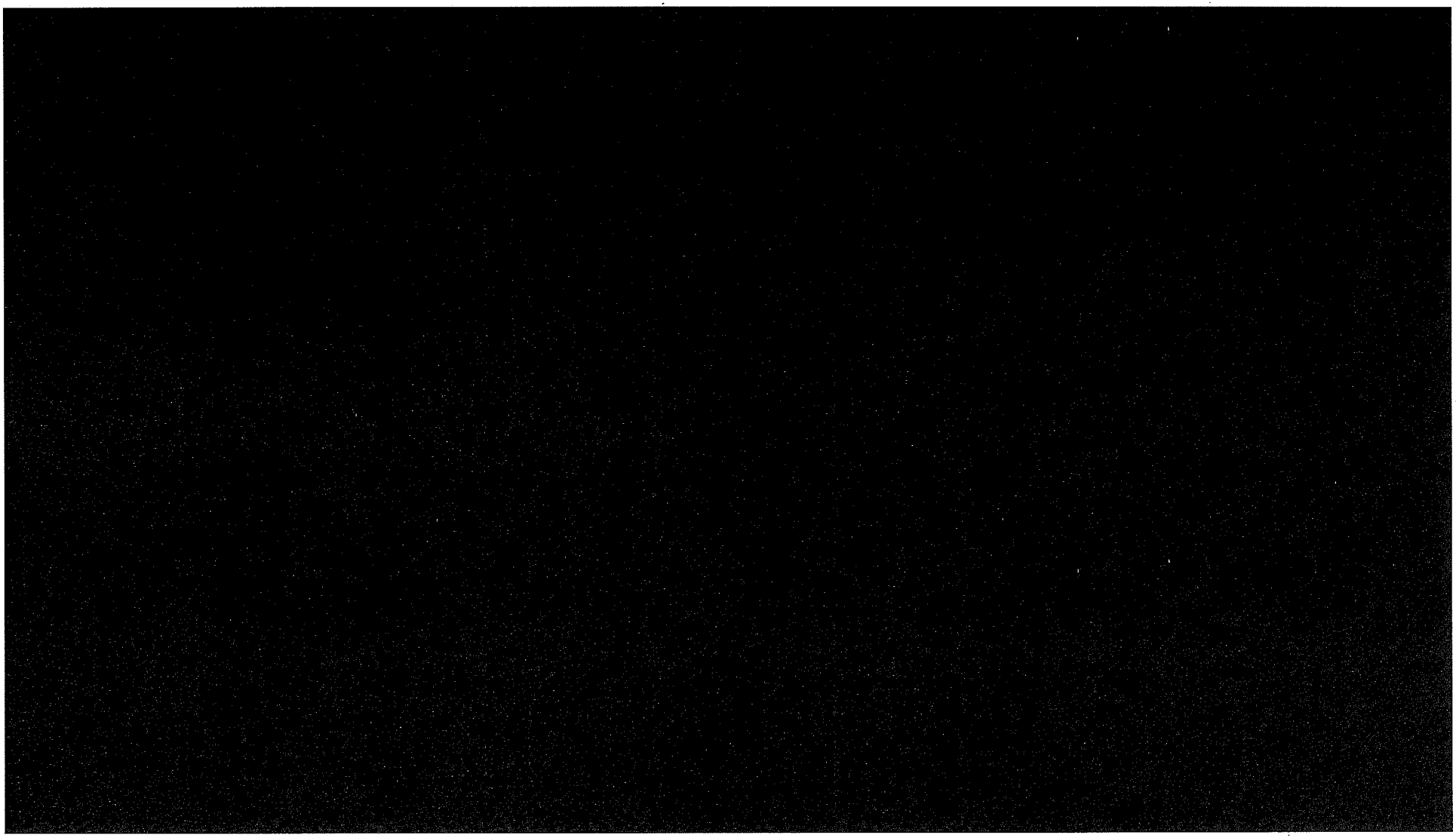


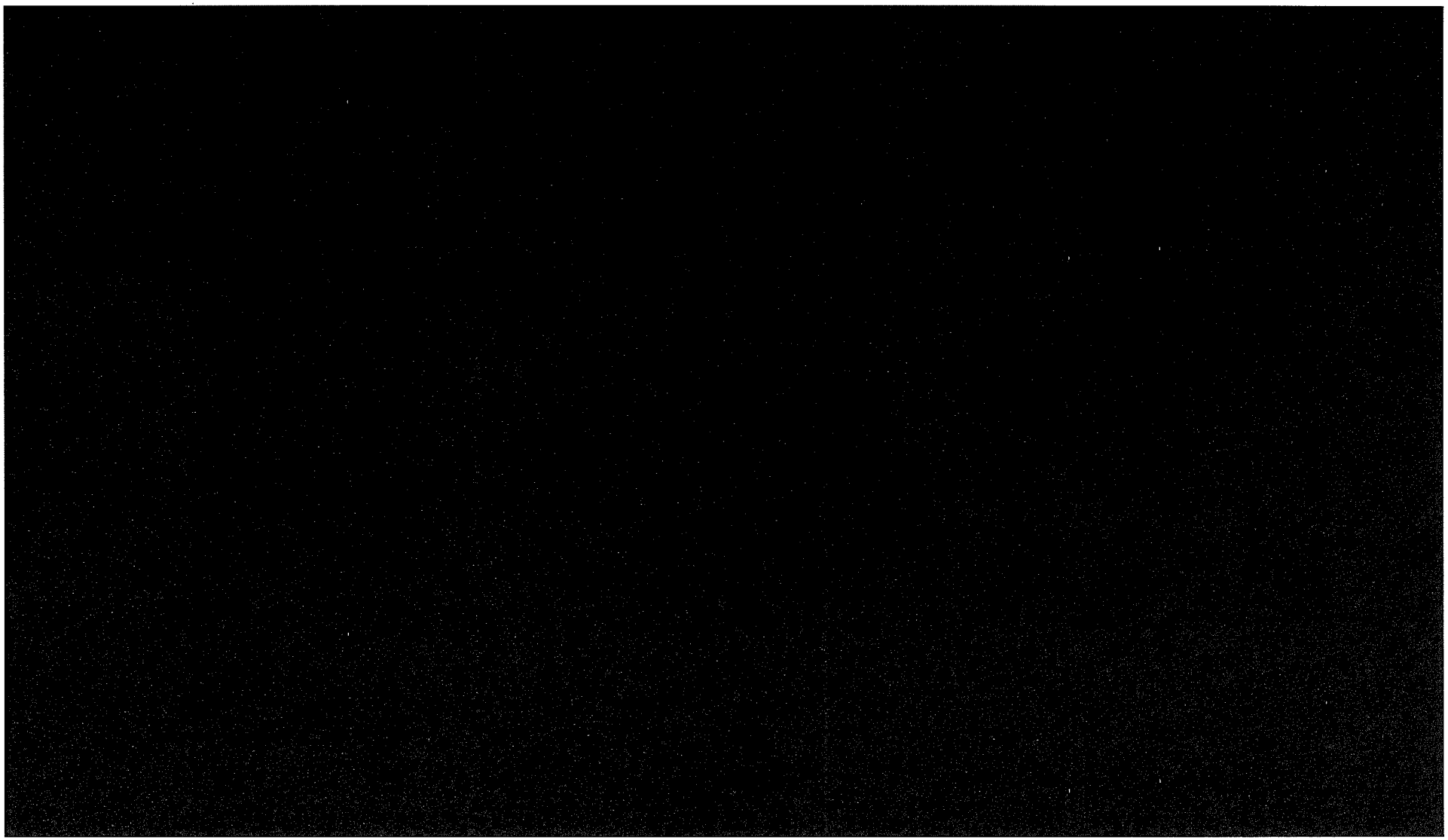


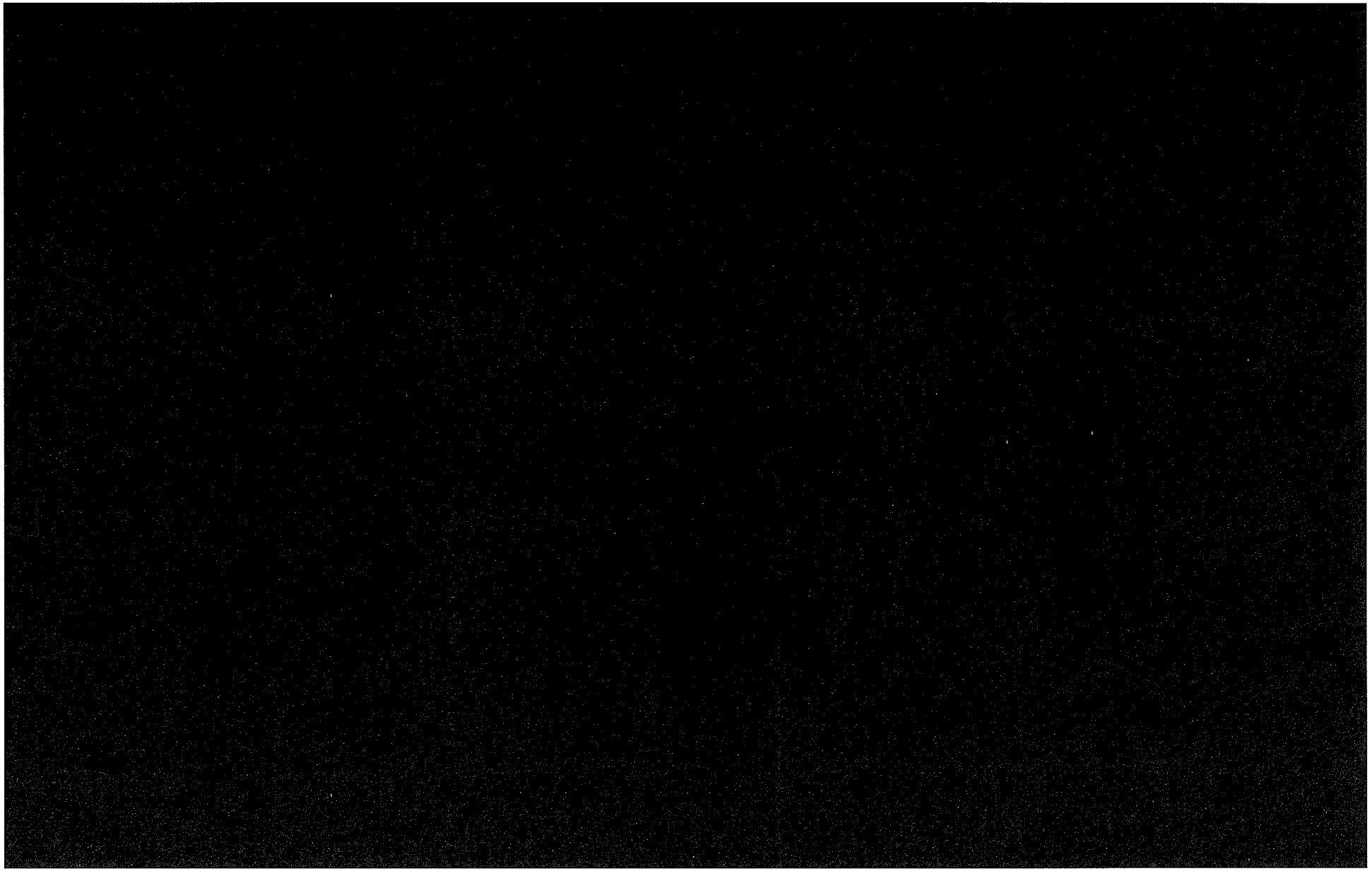
12.4 Appendix D – Project Programme

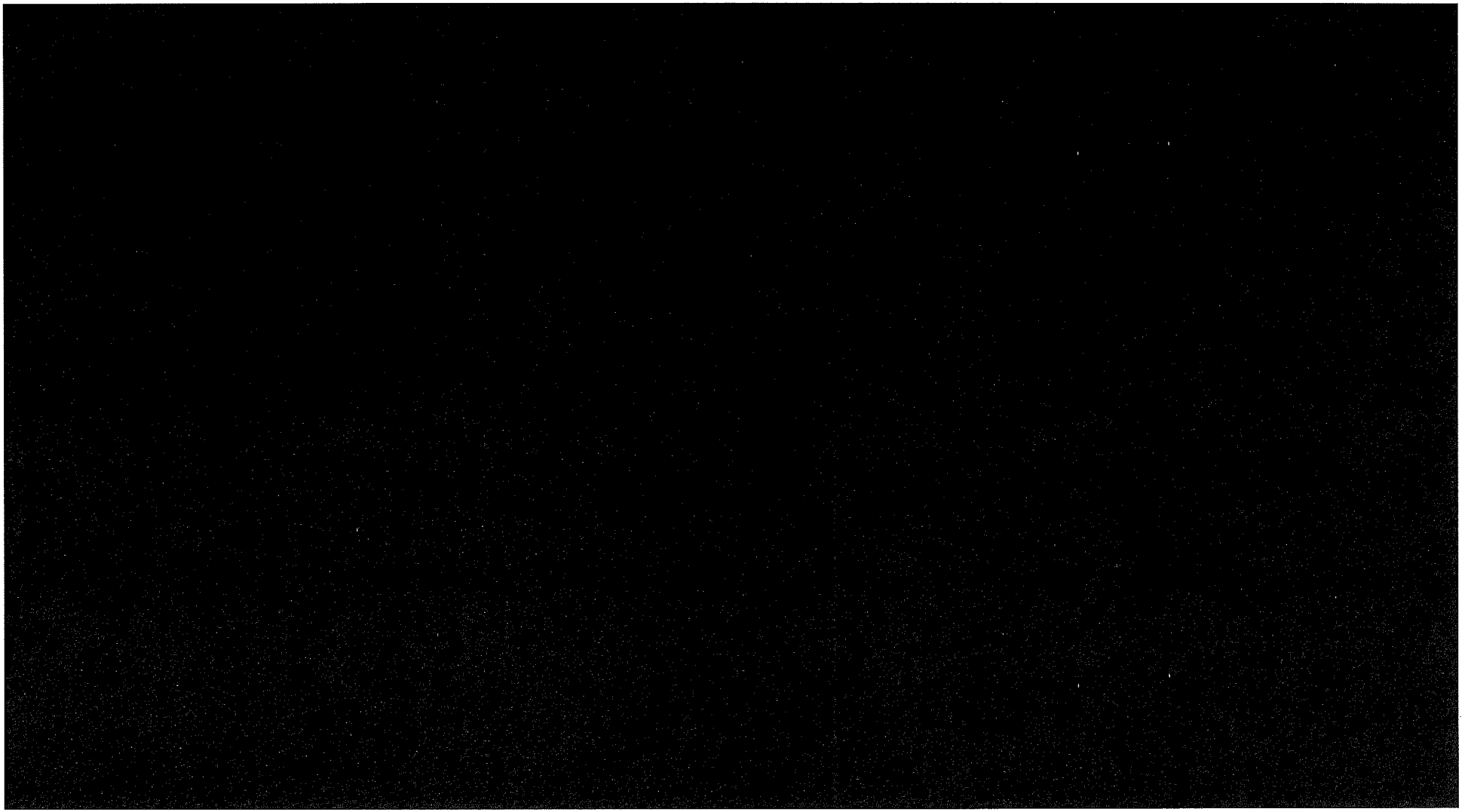












Stakeholder	Impact and interest on the project	Consultation to date	Method of Consultation	Planned consultation	Method of Consultation
Major Projects Canberra (MPC)	Leads the procurement and delivery of the Territory's infrastructure program in partnership with other directorates. They typically are designated projects that have significant complexity and scale.	Participation in various workshops during the Directions Paper, Feasibility Study and Business Case stages of the project. They were involved with several workshops such as the Risk Workshop and the entire process of developing the Business Case. They have also been engaged about the upcoming procurement of the project.	Consultation and Workshops	MPC will lead the procurement and delivery of the FOGO infrastructure project, including development of tender and contract document, tender evaluation and project oversight during the design and construction phases.	Consultation and Workshops

Stakeholder	Impact and interest on the project	Consultation to date	Method of Consultation	Planned consultation	Method of Consultation
Local community	Key stakeholders in the success of the FOGO facility. Community education and engagement is essential to ensure volumes and quality of feedstock. The local community is likely to benefit most from the project, particularly as this proposal is in response to community concerns.	Market surveys and engagement to understand broader level of food waste and interest in composting.		Education and engagement prior to rolling out the FOGO facility. Education and engagement are included in the waste collection business case and will be delivered using a combination of in-house ACT resource and contractor resources under the waste collection contract. Education engagement will take place at the end of 2021 prior the FOGO trial and will be refined and expanded prior to full rollout of the service across the ACT, including incorporation of specific advice or requirements from the selected FOGO processing provider.	Media Campaigns and Information Sessions

Collections contractor(s)	Waste collection is a key point of control for identifying sources of contamination and rejecting unacceptably contaminated loads to protect the overall quality of the recovered FOGO product. Once operational, the FOGO processing facility and FOGO collection service will have a directed working relationship. However, these services will be provided under separate contracts with the ACT Government, and the ACT Government remains responsible for managing the interface between waste collections and waste processing.	The Territory has commenced services for a FOGO pilot in November 2021. A proportion of the households in the pilot area have shared waste onsite collection arrangements. Information and data gathered from FOGO pilot will inform the city-wide roll out of FOGO collections to households. Consultation with local government councils, authorities and related government agencies has focused on the service model for the future FOGO collections, which is currently being tested in the pilot.		The current waste collection services contract is expiring in October 2023. A service provider for all household waste collection, including FOGO, will be confirmed through a tender process and collection services under the new contract will commence in October 2023. The Territory will be engaging the market through a first stage, Request for Information, process to understand the market's capacity to deliver FOGO collections within the Territory's context. The second stage procurement process will include requirements for FOGO collection, and the tender assessment and negotiation stage may include direct discussion with tenderers on FOGO-related topics. Tenderers may be required to propose contractual relationships and frameworks to effectively interface with processors. Once a preferred tenderer has been	Request for Information issued in late 2021.

12.7 Appendix G – Case Studies

Case study: Bunbury-Harvey Regional Council WA[29]

Population

Approximately 46,000 people across 7 local government areas.

The Bunbury-Harvey Regional Council (BHRC) owns and operates two waste processing sites serving seven local councils. These sites are the Stanley Road Waste Management Facility, which has a transfer station and a landfill, and the Wellington Regional Organics Processing Facility at Banksia Road, which is 20km away in the Shire of Dardanup. The seven local councils remain responsible for collection services, including deciding when and how to introduce FOGO.

FOGO program introduced

First adopted in 2013 by the City of Bunbury and the Shire of Capel. Other local councils have moved to FOGO over time, with 7 councils participating in 2019.

Tonnes of FOGO

18,000 in 2019. Facility is experiencing some operational pressures as it approaches its 20,000tpa licence limit.

FOGO processing technology

Open windrow processing with a mobile aerated floor system, and periodic turning of the piles to achieve uniform composting.

BHRC are constructing a new in-vessel composting system at their Stanley Road Waste Management Facility which will allow them to process higher tonnages and have secure land tenure for their organics processing. The IVC has been approved for 35,000tpa initial operating capacity, and designed to support future expansion up to 50,000tpa.

Contamination rates and decontamination

The average contamination rate is 2.4%. Contamination rates vary between councils, with three of the participating councils achieving contamination rates below 2%. Under the feedstock supply agreement, councils are obliged to pay a penalty if they exceed 5% contamination. This has not yet happened, and BHRC lets councils know when their contaminations rates are rising towards 5% so that they can reinforce education messages.

The site recently trialled manual decontamination of FOGO prior to composting. This is done by manual picking from loads tipped and spread on hardstand, before moving the decontaminated FOGO to the composting piles. BHRC are happy with the improvement in compost quality as a result of introducing this manual decontamination stage, but it is not a long-term sustainable approach. The design for the new IVC facility includes a conveyer system with manual picking.

BHRC emphasised that this is an unpleasant job, and they rotate it between different operational teams. BHRC have also gathered photos and footage of the decontamination process for councils to

[29] https://www.wasteauthority.wa.gov.au/programs/view/online-fogo-sessions

the organic certification as important to their brand and marketing. The also see organic farming as a growth area, particularly in viticulture, and they intend to continue with the organic certification.

Case study: Tweed Shire Council, NSW

Population

FOGO service provided to approximately 60,000 people in the region. Total population approximately 100,000 people.[30]

FOGO bins are provided to all single-unit dwellings in the Tweed urban area. Multi-unit dwelling and businesses can opt into the FOGO service for an additional fee.

FOGO program introduced

1 July 2017

Tonnes of FOGO

12,258 tonnes in 2018/19.

FOGO processing technology

FOGO collections are currently bulked at the council transfer station and transported 80km to Phoenix Power Recyclers in Queensland. Phoenix Power Recyclers is a commercial composting operation using predominantly open windrow composting. An in-vessel composting facility was constructed at the site and commissioned in 2019, to increase the quantities of commercial liquid waste and food waste that the site can accept.

In 2019, Tweed Shire Council conducted a competitive tender process and selected SoilCo to construct and in-vessel composting facility at the council's Stott's Creek Waste and Resource Recovery precinct, adjacent to the council-owned landfill. The facility will be delivered under a design-build-own-operate-transfer model and expected to be operational by 2022.[31]

The new FOGO in-vessel composting facility will have capacity to process up to 21,000tpa of FOGO material, and will also have flexibility to accept commercial food and organic wastes.

Contamination rates

Tweed Shire Council recorded a 4% contamination rate in 2018. This is somewhat higher than typical contamination rates for FOG in NSW but was acceptable to their processor. The Council is continuing to work on education and engagement to reduce the contamination rate over time.

Bin auditing and tagging found that 82% of green bins were being used correctly. Tweed is conducting ongoing bin inspections 3 days per week. A video of a waste collection truck using an onboard camera to view the contents of a bin and spot contamination was the most-viewed post on the council's social media channels, with around 9,000 views. Waste collection drivers reported 2,944 contaminated bins, helping the council to identify contamination hotspots. A targeted

[30] https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/wastestrategy/20p2373-appendix-waste-resource-recovery-report-2108-19.xlsx?la=en&hash=FDCE65DFA69AA7BD854471429BB39E09F9FCFA72

[31] https://wastemanagementreview.com.au/compost-by-the-river-soilco/

The Bega Valley Shire Council achieves one of the lowest contamination rates in Australia, averaging just 0.4% over their first year. This does not mean that contamination issues never arise. However, their operations still include feedstock decontamination. Feedstock is spread using a wheeled loader, and two staff carry out manual picking before the material is transferred to the composting windrows.[35] The council would also like to purchase a wind-sifter for their site, to help remove small pieces of plastic from the compost, as plastic contamination sometimes makes a batch unsaleable.[36] Another example of contamination challenge was a complaint received in 2020 about glass shards in a load used on a family garden.[37]

However, the service is generally operating well because residents have a strong understanding of the connection between their waste separation at home and the compost used in their parks and gardens, and this clear link helps to keep issues to a manageable level.

Compost outlets and experience

Composting is sold back to residents through each of the council's transfer stations. This has been well received, with compost supplies running out at sometimes of year. The council also uses the compost directly on its parks and gardens. The council is continuously building up the experience of its operational staff, with technical support from the technology provider of the aerated floor system. For example, in 2019 the site experienced some issues with balancing maturation time and compost supply. Some "young" batches of compost were released for sale when mature supplies ran out. However, these proved too immature and some gardeners reported issues with fluctuating pH and plant growth. As a result, Bega Valley increased their maturation time, meaning that compost was not available for a period of a couple of months. This is a typical example of the trade-off between processing time and product quality which all composting operations need to balance. [38]

Spotlight on education and engagement

Bega Valley Shire Council focused on community education and engagement in the lead-up to the FOGO rollout, supported by two grants from the NSW EPA, totalling $671,000 to cover the costs of caddies, community engagement and food waste avoidance activities. The council contributed its own funding to cover the cost of compostable liners and three temporary jobs in the FOGO education and rollout team.[39]

The council explained the incoming FOGO system to residents using a range of media platforms and physical mailouts. The council also produced a "FOGOmentary" video starring school children and ABC Gardening TV personality Costa Georgiadis which was launched at a gala event shortly before the FOGO service commenced and shared on various local media and social media platforms. The area has a high tourist population during summer holidays, so the council also worked with holiday accommodation providers to limit contamination during the tourist season. Education for this

[35] https://begavalley.nsw.gov.au/page.asp?f=RES-VFF-86-71-52
[36] https://begavalley.nsw.gov.au/page.asp?f=RES-VFF-86-71-52
[37] https://www.begadistrictnews.com.au/story/6858511/glass-shards-found-in-fogo-compost-after-spreading-on-family-lawn/
[38] https://begavalley.nsw.gov.au/cp_themes/default/page.asp?p=DOC-CML-68-53-24
[39] https://begavalley.nsw.gov.au/page.asp?f=RES-VFF-86-71-52

Compost is sold back to residents and is available for collection from the Cooma landfill site.[47]

Compost from the Snowy-Monaro FOGO service has also been used in an NSW EPA-funded trial demonstrating the benefits of compost in improving pasture for grazing. Controlled trials were conducted at two grazing properties with granite and basalt soils in the Cooma-Canberra corridor. The trials found that applying compost helped desirable cattle fodder plants to grow better, and reduced the pasture weed African Lovegrass by around 50% compare to the control areas. Compost supported the growth of feed crops by increases soils carbon and nutrient levels in forms which are readily available to plants. The trial results predict that within 5 years, improved pasture productivity could eliminate the need to purchase stock feed in winter.

Case study: City of Sydney food waste collection trial in MUDs

Population

Trial currently involved 88 actively participating MUDs buildings, with a further 11 approved but not yet commenced collections. The largest participating complex includes 810 dwellings across 17 buildings, within a single development. The total CoS LGA has around 2000 MUD buildings. Extension of the service to all MUDs is envisioned under the CoS 2030 plan. [48]

Food waste trial introduced

2019

Food waste processing technology and contamination

Food waste is sent for anaerobic digestion at the Earthpower facility in Camellia. The food organics from CoS are a very small component of overall feedstock for that existing facility. Arup also consulted with the Earthpower operator, who was very satisfied with the quality and composition of the waste from the CoS trial. No contamination issues have been experienced to date.

Rollout and engagement

Arup consulted directly with the City of Sydney, which is currently trailing an opt-in food organics collection service for both detached houses and multi-unit dwellings. This service achieves excellent performance with respect to contamination, as confirmed by the food waste processor, Earthpower. The City of Sydney acknowledged that the opt-in format means that all households participating in the scheme must demonstrate some active interest, which supports good engagement and low contamination. The City of Sydney trial experience also noted:

- Engagement with each participating MUD building to gain support from the strata committee and the building manager and ensure that FOGO bins can be installed and managed effectively within the existing building systems.
- On-line and in-person sign-up campaigns for each building, achieving an opt-in rate of about 40% among residents in participating buildings.

[47] https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/wastegrants/18p0747_snowymonaro-cooma-fogo-case-study.pdf

[48] https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/wastegrants/18p0694-monaro-lovegrass-case-study.pdf

Infrastructure and service format preferences

England has steadily reduced household waste to landfill since 2001. Between 2001 and 2010, greater recycling and composting drove this improvement, and the UK now has significant depth of experience in organics recovery infrastructure. [49]

The waste infrastructure mixes initially included MBT facilities to extract organics from mixed residual waste. However, over the last decade there has been a strong shift away from MBT facilities and towards source segregation of food and garden organics from composting and anaerobic digestion. This has included repurposing of buildings and mechanical components of MBT facilities to transition to source separated organics.

It is common in the UK for garden waste to be collected separately from food waste. This is motivated in part by the fact that local authorities are not allowed to impose a direct charge on households for collection of residual waste, including food waste. However, garden waste can be charged separately, which drove the early introduction of separate garden waste collections. A fourth collection stream for food waste was introduced later in many areas, as MBT treatment of mixed residual waste became unacceptable.

Garden waste is predominantly directed to open windrow composting. Food waste is directed either to wet anaerobic digestion, which is well established in the UK due to renewable energy subsidies, or to in-vessel composting, where it is mixed with other wastes to achieve a suitable bulk density and carbon: nitrogen ratio for composting.

Infrastructure procurement

The Public Financing Initiative (PFI) was set up in the early 1990's to provide private financing for a range of public infrastructure, and later adjusted and renamed to Public-Private Partnerships (PPP). It was used heavily for waste infrastructure between roughly 2000-2010. PFI/PPP financing was a solution to tight restrictions on capital expenditure by local governments. The private sector provided the capital for infrastructure works, and this was translated into recurrent payments from the government reflective of the capital investment, cost of borrowing, and a margin covering profit and risk for the infrastructure provider. These recurrent payments were seen as easier to for local governments to manage. However, over the last decade there has been a shift away from this delivery model, including a general view that it has not necessarily offered value for money for waste infrastructure in the UK. There have been various instances of local governments faced with budgetary pressures acting on financial advice to pay for an early exit from PFI contracts. In some cases, the early exit agreement has also been initiated by the contractor. This comes in the context of a general shift back towards local governments directly delivering a wider range of services, including waste collections and some waste processing.

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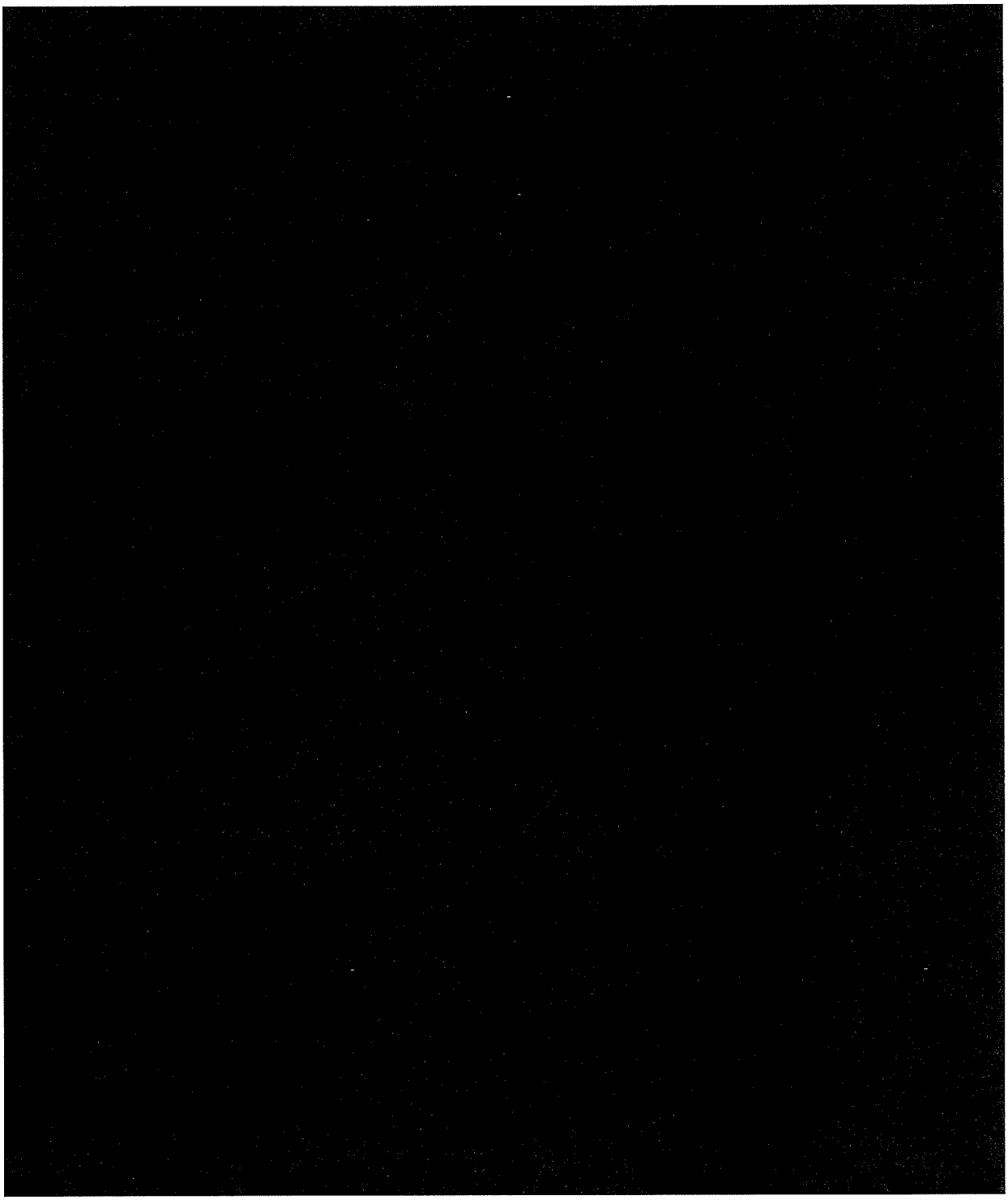
49 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/710124/Digest_of_Waste_and_Resource_Statistics_2018.pdf

Opex

Total opex risk - 'Modelling opex'!AP9

Report: Compact Output Report
Performed By: Miles.Miranda
Date: Tuesday, 18 May 2021



12.9 Appendix J – Delivery Model Shortlisting

- The long list of delivery models considered for delivery of the FOGO facility are shown in the table below. These have been based on the ACT Government Capital Framework, Draft Delivery Model Analysis Guidelines, and grouped into the following four categories. Group 1: User Charge PPP, Availability PPP, DCMO
- Group 2: MC, Alliance, ECI, Delivery Partner
- Group 3: D&C, DCM
- Group 4: PMA, D then C, CM

Table 58: Delivery Model groupings

Delivery model type	Specific Models
1. User Charge PPP, Availability PPP, DCMO	• Design Construct Maintain Operate • Availability PPP • User Charge PPP
2. MC, Alliance, ECI, Delivery Partner	• Managing Contractor • Alliance • Early Contract Involvement • Delivery Partner
3. D&C, DCM	• Design & Construct • Design, Construct, Maintain (Long term)
4. PMA, D then C, CM	• Design then Construction • Document & Construction • Design, Construct, Maintain (Short term) • Project Management Agreement • Construction Management

These four groups have been used to shortlist Delivery Models, based on a range of key criteria. The short-listing process aimed to assess the appropriateness of each model in relation to the project in terms of scale, scope, risk and whole-of-life service opportunities.

The approach used is summarised in Table 59 below.

Table 59: Delivery Model Shortlist Checklist

Issue	Project Details	Group 1	Group 2	Group 3	Group 4
Scale					
Is the project value over $100 million?	**No**	✓	✓	✓	✗
Is the project value under $50 million?	**Yes**	✗	✗	✓	✓
Are there substantial lifecycle costs?	**Yes**	✓	✗	✗	✗

to a minimum amount of organic waste to be processed by the facility, with gate fees to be payable on the basis of the higher of actual throughput or minimum agreed tonnage.

Delivery Model Shortlist

- Design Construct Maintain Operate
- User Charge PPP
- Design & Construct
- Design, Construct, Maintain (Long term)
- Design then Construction
- Document & Construction
- Design, Construct, Maintain (Short term)
- Project Management Agreement
- Construction Management

Validation

To validate the delivery model selection, market sounding and benchmarking to other projects was completed as part of the Feasibility Study. The market sounding is summarised above in Section 6.3.2 above.

Detailed Delivery Model Assessment

The process of selecting the preferred delivery model applied a Multi-Criteria Analysis (MCA) on short-listed options. The MCA consisted of four key steps which are outlined in Figure 18.

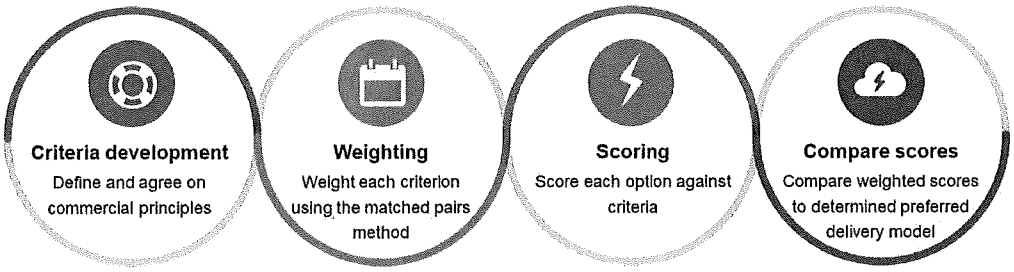


Figure 18: Multi-Criteria Assessment Framework

The results of the scoring process for each of the options, in relation to each of the Commercial Principles (Criterion) in the sections below. A brief justification for the scoring has also been provided.

Time to deliver

Delivery Model	Score: Time to Deliver	Justification
Design then Construct	4	Flexible to meet time requirements with advantage of rapid procurement
Design & Construct	4	Flexible to meet time requirements with advantage of rapid procurement
Design Construct Maintain (Short Term)	3	Can meet delivery time requirement; procurement process may take slightly longer than traditional D&C methods
Design Construct Maintain (Long Term)	3	Can meet delivery time requirement; procurement process may take slightly longer than traditional D&C methods
Design Construct Maintain Operate	3	Can take longer to document than a traditional procurement method which can delay commencement.
User Charge PPP	2	Longer procurement period expected for PPP, as greater time is needed for Government to prepare tender and contractual documents, longer tender evaluation period due to greater levels of due diligence, and fundraising activity and more stakeholders involved (particularly due to financing element), which combined can delay commencement.

Flexibility

Delivery Model	Score: Flexibility	Justification
Design then Construct	4	Contract can be easily amended to address variation arising from uncertainty at initial stages
Design & Construct	3	Ability to accommodate uncertainty and variation ultimately dependent on contract terms and nature of project
Design Construct Maintain (Short Term)	2	Limited ability to innovate or upgrade until initial operating term has concluded. Design may be influenced by initial operational model and expensive or

Delivery Model	Score: Level of Risk Transfer	Justification
Design then Construct	2	Little or no involvement by operator in the D&C phase, resulting in risk of suboptimal operations / functionality, or expensive refit after initial O&M term.
Design & Construct	2	
Design Construct Maintain (Short Term)	4	
Design Construct Maintain (Long Term)	4	Compost market risk remains with ACT to resolve. Considerable interface risk between construction and operations. ACT can share in any compost/output upsides
Design Construct Maintain Operate	5	Integrating the D&C and operational phases of the project encourages private sector to ensure design is focused on maximising operational functionality. Contractor assumes significant risk.
User Charge PPP	5	The most complete level of integration between D&C and operating phases, with the incorporation of private financing. As a result, encourages private sector to focus on optimising whole of life costs. Contract typically assumes the majority of risk under this model.

Innovation and Incentive

Delivery Model	Score: Innovation and Incentive	Justification
Design then Construct	2	Output is fixed at the outset with minimal opportunity or incentive for the contractor to drive innovation.
Design & Construct	3	Innovation is possible during the design phase.
Design Construct Maintain (Short Term)	3	Innovation is possible during the design phase.
Design Construct Maintain (Long Term)	4	Design and build will be incentivised for long term costs savings for maintenance.
Design Construct Maintain Operate	4	Incentivises for whole-of-life cost savings for maintenance and operations

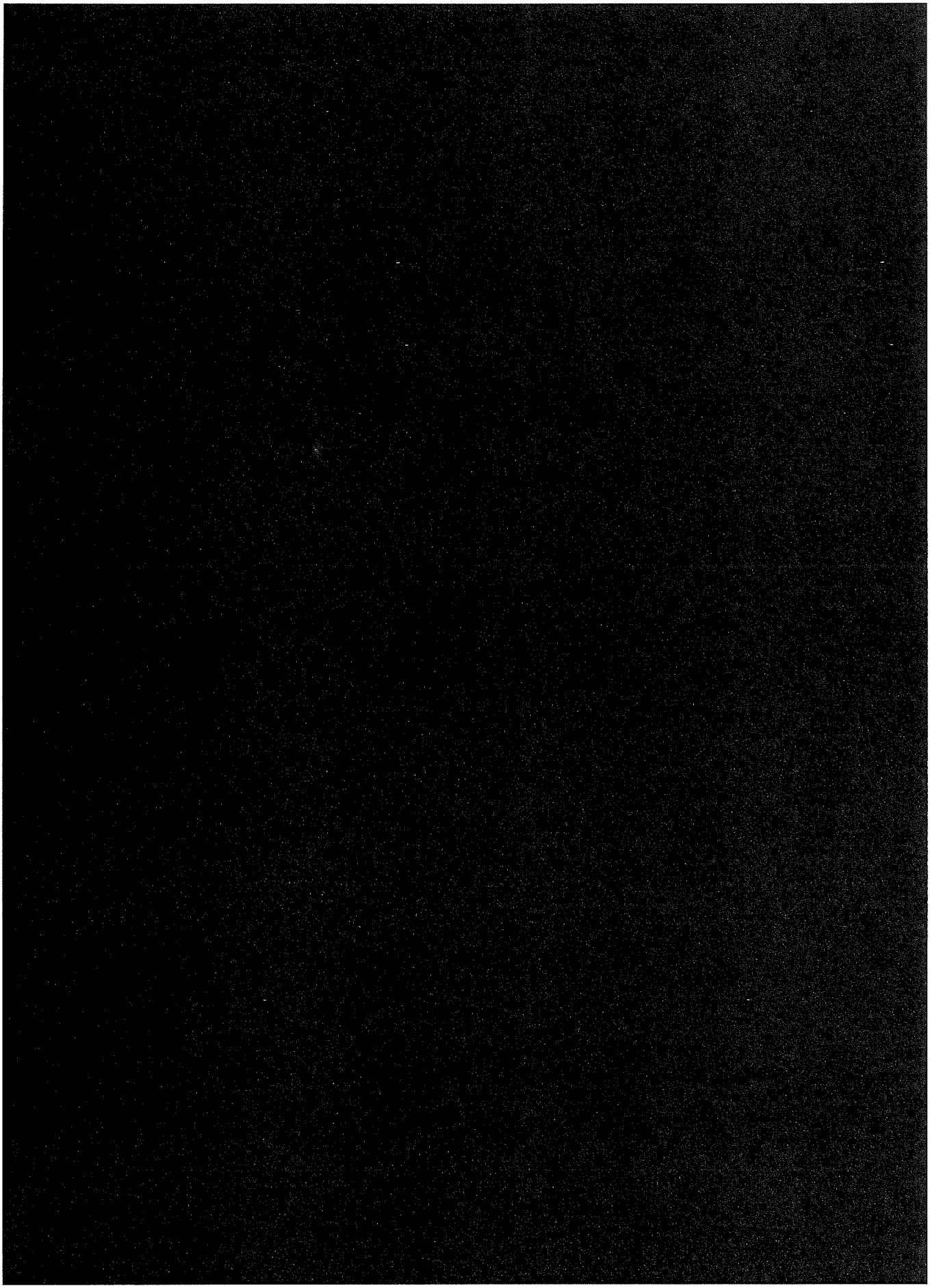
Delivery Model	Score: Cost and Level of Complexity for Government	Justification
Design Construct Maintain (Short Term)	3	Some complexity arising from incorporating short term O&M to D&C arrangements. Additional time and/or cost may be incurred in procurement due to the need to identify and vet bidders with ability to deliver during both the D&C and O&M phases.
Design Construct Maintain (Long Term)	2	Separate arrangements would need to be made for operations (either self-operated or outsourced), increasing effort and cost associated with documentation. Additional time and/or cost may be incurred in procurement due to the need to identify and shortlist bidders with ability to deliver during both the D&C and O&M phases.
Design Construct Maintain Operate	2	Complex contractual arrangement, which has limited precedent in ACT context. Procurement process will be more complex due to the need to identify and shortlist bidders with ability to deliver during both the D&C and O&M phases.
User Charge PPP	1	Complex contractual arrangement. Procurement process will be more complex due to the need to identify and shortlist bidders with ability to deliver during both the D&C and O&M phases. Further time and cost incurred in understanding and evaluating bidders' proposed financing arrangements.

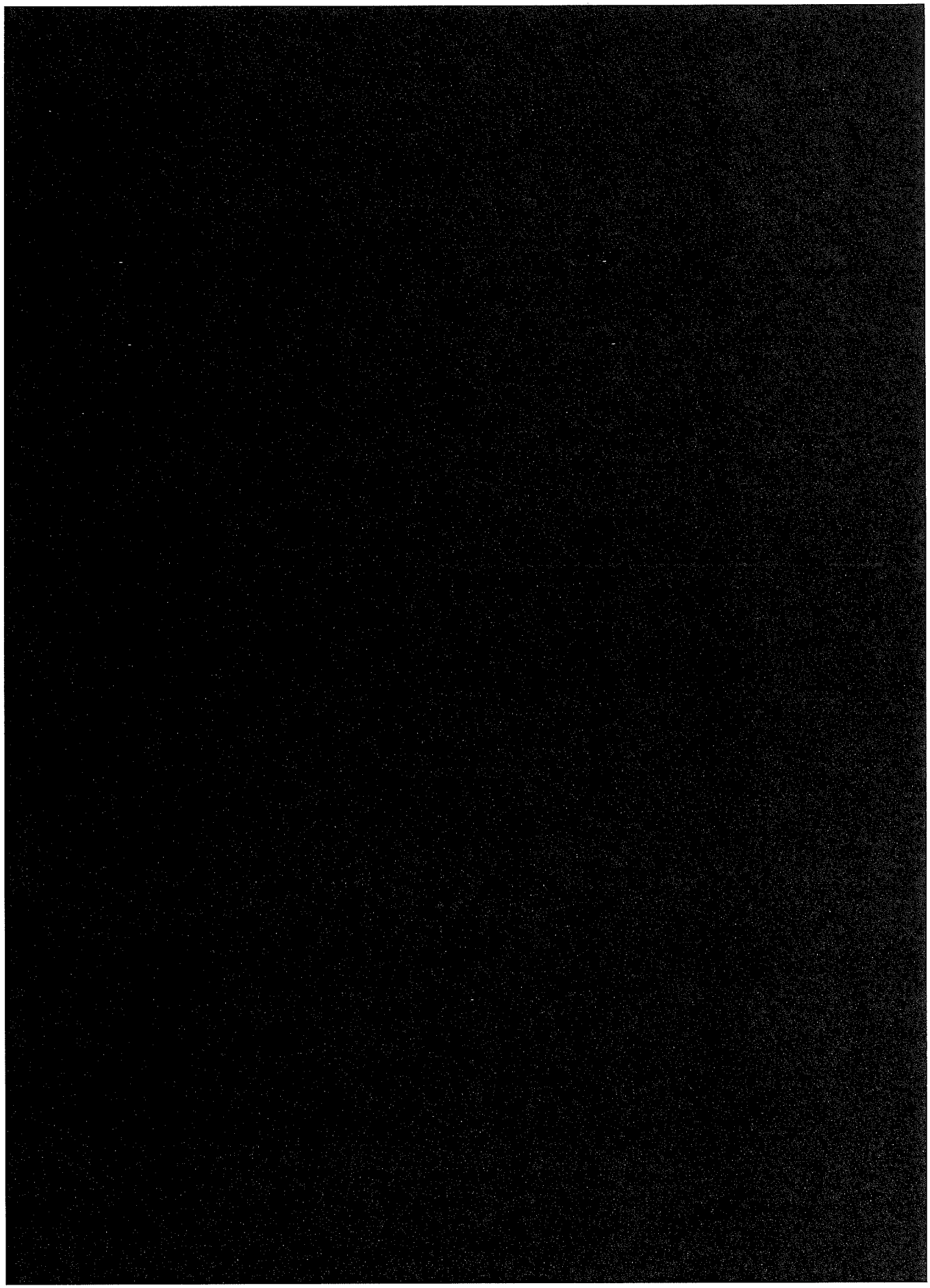
Price Certainty

Delivery Model	Score: Cost and Level of Complexity for Government	Justification
Document & Construct	2	Provides only short-term construction price certainty in accordance with agreed terms, but

Table 62: Summary of MCA Analysis

MCA Criteria	MCA Weighting	Document & Construct	Design & Construct	Design Construct Maintain (Short Term)	Design Construct Maintain (Long Term)	Design Construct Maintain Operate	User Charge PPP
Time to deliver	16%	4.0	4.0	3.0	3.0	2.5	2.0
Flexibility	11%	4.0	3.0	2.0	2.0	2.0	1.0
Level of Integration / Bundled Services	16%	1.0	1.0	3.0	3.0	5.0	5.0
Level of risk transfer	16%	2.0	2.0	4.0	4.0	4.5	5.0
Innovation and Incentive	11%	2.0	3.0	3.0	3.5	4.0	5.0
Output Specification	5%	1.0	1.0	4.0	4.0	5.0	5.0
Procurement Cost and level of complexity for Government	11%	5.0	5.0	3.0	2.0	2.0	1.0
Price Certainty	16%	2.0	2.5	3.0	3.5	4.0	5.0
TOTAL	Total / 5	2.63	2.71	3.11	3.13	3.63	3.68





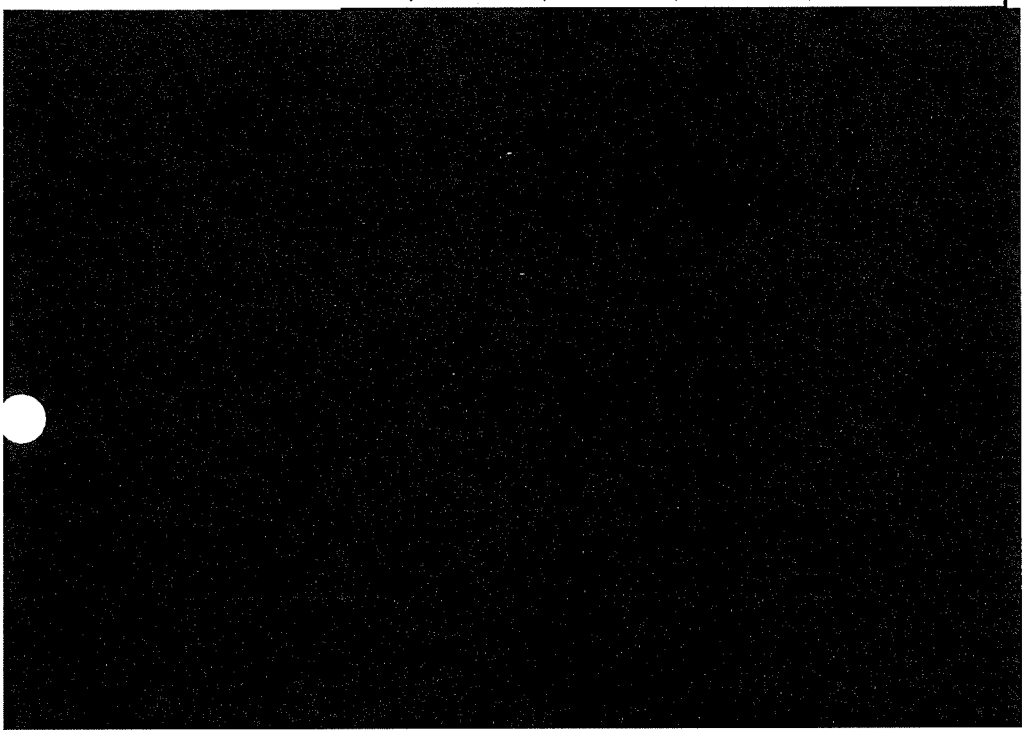
PART B - TEMPLATE SUMMARY

TCCS- 2023-24 Initiatives Costing Template

Business Unit 712_ACT NoWaste

Initiative Description

2023-24	2024-25	2025-26	2026-27	Total
$'000	$'000	$'000	$'000	$'000



Click to go to

calculated

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ACT Government

Single Assessment Framework (SAF)

Business Case

Tier 1 (over $50 million or High Risk)

Project Name:	ACT NoWaste FOGO Facility
Total Project Value (estimated) FY24- FY27:	[redacted] m (nominal, risk adjusted) including GST plus/[redacted] excluding GST PLUS [redacted] (O&M) including GST/[redacted] excluding GST Total [redacted] including GST/[redacted] excluding GST
Capital Appropriation Requested FY24- FY27:	[redacted] (nominal, risk adjusted) including GST [redacted] (nominal, risk adjusted) excluding GST
Project Stage:	Planning
Risk Assessment (high/med/low):	Medium
Proposed Delivery Model:	DCMO
Requesting Directorate:	ACT NoWaste
Requesting Minister:	Chris Steel MLA
Business Case Advisors:	Arup

NOTE: This template should be completed using the accompanying SAF Business Case Guidance Notes.

Contact Officers

Contact Officer, Requesting Directorate	
Reviewing Officer, Infrastructure Finance and Reform, Treasury (IFR):	
Reviewing Officer, Major Projects Canberra (MPC)	
Reviewing Officer, Finance and Budget Group, Treasury (FABG):	

Sign Offs

Requesting Directorate: _____ *Document in order to proceed*

IFR _____

MPC: _____

Contents

1. Executive Summary

1.1 Statement of Need

The Territory urgently needs a Food Organics and Garden Organics (**FOGO**) processing facility. The original fully justified business case was supported with a provisional allocation of funding in the 2022-23 budget. The provision of the funding was dependent on further information being provided on:

1. The co-funding contributions, Commonwealth funding, NSW Government and Industry Partner
2. Updated Milestones
3. Potential revenue streams from sale of finished product and services offered to other Councils
4. Risk in finding end markets for finished product.

Since the 2022-23 decision, TCCS has been successful in securing [redacted] in co-funding contributions from the Commonwealth Government through the 'Food Waste for Healthy Soils Fund'. The Commonwealth is contributing up to one third of the costs of the construction of the Facility. This funding, plus the intention to seek a co-contribution to the Facility from the industry partner of $13 million, has significantly reduced the Territories funding risk exposure from this project.

During 2022-23 TCCS, in partnership with Major Project Canberra, TCCS has commenced the procurement process for the design, construct, maintain and operate (DCMO) of the Facility. This planning has demonstrated that to model the potential revenue streams from the finished product (Q3 above) and investigate the end markets for the final product (Q4 above) a two-stage procurement process of a request-for-proposal (RFP) and then a request for tender (RFT) would be required. This is adding additional time to the delivery of this facility.

Other processes are required to deliver a project of this size and nature, and these are progressing such as the Environmental Impact Study (EIS) required for the construction of the facility at Hume. The EIS is due for completion in August 2023, which will include the individual studies and the community consultation. This process will end up being 18 months to complete. Similarly, the process to lodge and gain approval for the development and the full construction of the FOGO facility has been identified to be longer and has led to a delivery date in 2027.

TCCS is taking what possible measures to speed up the procurement process. The approach to market for a single-phase, Request for Proposal or Tender, would reduce this time. The Directorate has engaged Arup Australia, who is directly assisting to design and write some of the procurement elements, to speed up the process. Also, a project team with dedicated resources has been established.

However, the recent fire at the Materials Recovery Facility (MRF) in December 2022 has introduced new challenges that the same project team is currently addressing. The MRF manages the co-mingled (yellow-bin) waste stream for the Territory and the loss of this facility is a major set-back to locally sorting glass, metal and plastic material. The team is addressing the immediate needs of the procurement for the new MRF building alongside this FOGO facility. Both infrastructure projects are a priority for the delivery of waste outcomes in the Territory.

of an organic waste recovery facility to treat food and garden organic waste (**FOGO**) to produce a clean, high-quality compost. This requires the procurement of an in-vessel composting system (**IVC**). The facility is expected to treat up to 50,000 tonnes per annum of food organic and garden organic waste. This is based on the projection that there will be 42,000 tonnes of waste produced by ACT residents to be collected at kerbside, with the expectation that this will increase with population growth. The IVC facility is expected to have a CAPEX cost of [redacted] (FY21, real terms) of which [redacted] million (FY21, real terms) is the infrastructure construction cost and [redacted] (FY21, real terms) is the external utilities connection allowance. Section 4.2.1 summarises the breakdown of total capital costs.

There is an opportunity for the ACT to use this compost in various applications such as landscaping of urban developments, parks and gardens, retail nurseries and sale for home gardening and landscaping, maintenance of sporting fields, rehabilitation and landscaping of transport corridors and other construction sites. Opportunities also exist for using the compost in agriculture and horticulture such as dairy pastures, orchards, broadacre cropping and viticulture, thus ensuring waste organics are dealt with in a truly circular way.

Currently, the ACT offers an opt-in household collection service and a free drop-off option for garden organics which are processing in open windrow at the Corkhill Brothers site at Mugga Lane. However, this existing operation cannot process food waste from a whole-of-ACT FOGO service through open windrow composting due to amenity risks – particularly odour. There are currently no facilities in the ACT which can process and recover FOGO material due to the putrescible nature and amenity risks posed by raw food waste. A separate services business case will be submitted to support the consolidation of ACT's current waste collection service contracts into a single collection contract, including the opportunity to replace the current garden waste collection service with a FOGO collection service. This business case provides an approximate budgetary impact to include FOGO bin collection into the overall household waste collections contract. These costs are provided to inform Cabinet of future potential budget impacts, but this funding is not requested at this time. Section 1.6 summarises the household collection contract and associated costs.

1.2 Project Solution

From the findings of the 2020 Directions Paper and Feasibility study, the proposed future solution for management of organic waste seeks to expand the existing opt-in garden organics collection to a mandatory food and garden organics service (FOGO) for households. This will require establishment of a dedicated processing facility, with the most appropriate technology having been identified as in-vessel composting (IVC).

The proposed service is expected to recover approximately 42,000 tonnes per annum of FOGO feedstock upon commissioning, made up of approximately 70% garden organics and 30% food organics. The facility will be sized for at least 50,000 tonnes per annum of processing capacity, and no major expansion works is expected on the facility within the first 15 years of a proposed 20-year operations contract.

1. Request for Proposal (RFP) from bidders which contains a detailed description of the ACT's needs, reflecting the project outlined in this Business Case; and

2. Request for Tender (RFT) from shortlisted bidders that considers any market feedback received during the RFP stage, to the extent permitted by procurement rules.

This process is reflected in the project programme at Appendix D and based on consultations between NoWaste and MPC.

1.4 Funding Approval Sought

1.4.1. Type of funding sought

☐ Feasibility*
☐ Concept design
☐ Detailed design (note only where D+C has been justified)
☐ Full Business Case
☒ Delivery/Construction

*regardless of dollar value of the feasibility funding being sought, it is the estimated total value of the project which guides which Tier the project is considered under.

1.4.2. Cost Estimate

Benchmarking analysis has been used to estimate the capital and operating costs of the project. Benchmarks included:

- Recent tenders for a comparable project in NSW
- Publicly available information on domestic and international in-vessel composting facilities

The primary estimated costs are reflective of the feasibility stage of the project. Costs will be refined throughout the project lifecycle, particularly as contractor tenders are returned with fixed prices and other quotes for primary elements are received by the ACT Government. Estimated capital and operating costs excluding risk adjustments are shown in

Table 1 and Table 2. Table 3 shows the operating cost for the first full year of operation. Approval to proceed with undertaking the Environmental Impact Statement (EIS) process and early preparation of term sheet for engagement of a contractor is now confirmed to progress the project from the feasibility phase to next stage. This is allowing for activities such as planning approvals, legal advisory, financial advisory. An allowance of [redacted] is allocated for project support during preparation of procurement specification, procurement evaluation and final contract negotiations.

Table 1: Capital Costs

Values are based on the 2021 Financial Model prepared by ARUP.

Item	Value ($ FY21, real)
Development capital costs	[redacted]
Project support costs	[redacted]

			traditional government procurement
Capex	[redacted] uplift in overall capex	[redacted] of the initial capex risk is allocated to Government	[redacted] of the capex risk is allocated to Government
Opex	[redacted] uplift in annual opex	[redacted] of the initial opex risk is allocated to Government	[redacted] of the opex risk is allocated to Government

1.4.4. Cost to Government

The assessment has identified an opportunity to deliver at lower cost to government by employing the DCMO instead of traditional government procurement. The Public Sector Comparator (PSC) reflects the cost of government delivery and consists of the raw capital and recurrent costs, and project risks, including both those that could be transferred to private sector through a DCOM model, and non-transferrable risk.

The risk-adjusted net present cost to government under the DCMO model amounts to [redacted]. Table 5 shows the breakdown of net present costs to government.

Table 5: Net present costs to government under DCMO and PSC

DCMO	Value ($, Discounted)	PSC	Value ($, Discounted)
Risk-adjusted capital	[redacted]	Risk-adjusted capital	[redacted]
Risk-adjusted recurrent costs to	[redacted]	Risk-adjusted recurrent costs to	[redacted]
Net present cost to government	[redacted]	Net present cost to government	[redacted]

As shown in Table 6, the preliminary results of the analysis shows a [redacted] saving for Government if the project is procured as a DCMO.

Table 6: Risk adjusted cost of delivery, PSC vs. DCMO

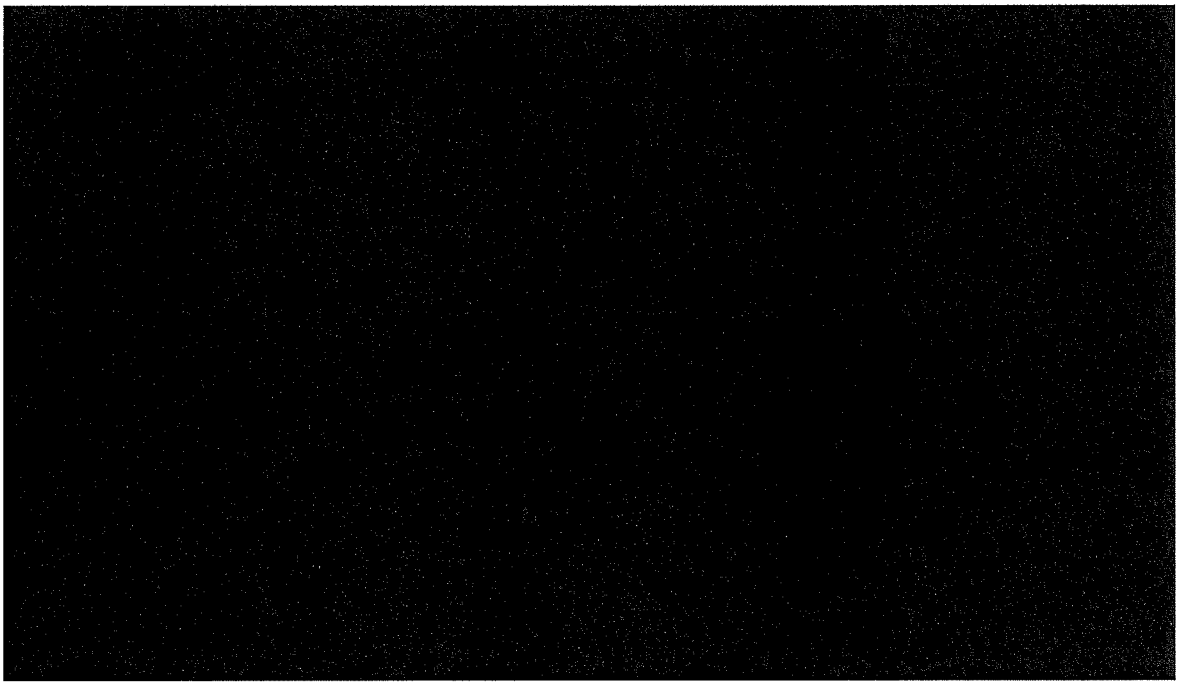
	PSC	DCMO
Risk-adjusted NPC cost to Government	[redacted]	[redacted]

There are two main drivers that causes the price differential between PSC and DCOM:

1. Different discount rate is used between PSC and DCMO

This Business Case seeks funding for the -2023-24 and 2024-25 financial years for the development costs for the FOGO Facility – including a portion of the design development capex required to progress the project from the feasibility phase to construction. This allows for activities such as planning approvals, Front End Engineering Design (FEED), procurement, legal advisory and financial advisory. This Business Case, other than the Financial Impact summary at table 7, reflects the full FOGO Facility costs and analysis.

Table 7: Preliminary financial impacts summary ($nominal FY 2023-24)



*O&M cost has been estimated for 4 month in 26-27, 27-28 the cost is estimated to be [redacted] per annum (indexed [redacted] by [redacted])
**Offsets from industry are dependent on the RFP
***depreciation is [redacted] per annum, depreciation will apply from 27-28 onwards

This funding profile would see the FOGO facility completed and ready to commence operations from March 2027. This would allow city-wide FOGO collection services to commence in Q2 2027. While this is later than the government's commitment in the *ACT Parliamentary and Governing Agreement (PaGA)*, the launch of the FOGO pilot in Belconnen combined with the progressive construction of the FOGO facility would provide a clear demonstration of progress during 2022-23. Delaying a

In order to *'Encourage reduced waste and improved resource efficiency in new development and support continued reduction of the ACT's ecological footprint'*[1] (action 3.6.2 of the ACT Planning Strategy 2018) additional funding is likely to be required to deliver best practice waste collection services to multi-unit developments, both new and existing.

In addition, the cost of providing waste collection services is likely to require an increase in operational funding due to increasing population and expected increases in service rates during the contract re-negotiation. The current rates for general landfill waste and recycling collections were negotiated in 2013, and service expectations have changed over this time and are expected to be reflected in somewhat increased rates.

All of these actions deliver on commitments in the *Parliamentary and Governing Agreement for the 10th Legislative Assembly*, the *ACT Climate Strategy 2019-2025*, and delivers resource recovery targets for the ACT.

1.6.1. Method of delivery

It is currently proposed the consolidated household waste collection service be delivered under a contracted model using a performance-based services contract with a single principal contractor partnering with appropriate sub-contractors. This aligns with the current delivery model.

An initial market engagement has informed components of the collection service including zero emission waste vehicles, the FOGO collection service, depot sizing and placement, options for collections in a growing and more densely populated city, and the charter of procurement values. A single-phase open tender will be released in Q1 2023.

1.7 Stakeholder engagement

In preparing this business case, ACT NoWaste and its advisors have prepared various preliminary documents, participated in internal workshops and carried out market soundings. This includes:

1. Directions Paper in June 2020 that considered a range of high-level options for processing technology and feedstock for treating household FOGO waste and delivery model options.
2. Feasibility Study in November 2020 that investigated the preferred solution.
3. ILM Workshop that focused on the themes and needs to be addressed by the infrastructure solution.
4. Market sounding with potential contractors around solutions (throughout 2020)
5. Market sounding with financiers and operators around delivery model solutions (November-December 2021)
6. Various Workshops with Treasury and MPC throughout 2020 and 2021 in respect of delivery model and procurement approach.

A version of this business case was presented in May 2021, and 2022, and the business case has been updated following feedback and further information.

[1] https://www.planning.act.gov.au/__data/assets/pdf_file/0007/1285972/2018-ACT-Planning-Strategy.pdf

impacts of organic waste to the community and create value from the output. The objectives of the project are to:

- Meet the commitment under the ACT Climate Strategy 2019-2025 "to introduce food and garden waste collection for all households (including multi-unit dwellings) from 2023, and support with an education program from 2020"
- Move the ACT towards the 90% resource recovery target (by 2025) set in the Waste Strategy – it is estimated that FOGO will contribute to an approximately 4% contribution to this target
- Deliver new organics processing infrastructure within the ACT, converting FOGO material into useful compost products
- Support carbon neutrality of the waste sector
- Help redirect from landfill c.50% of available organic material in the domestic (currently 37% organic composition in red bin) and commercial waste stream, and
- Engage with the local community to drive behavioural change.

The introduction of the ACT Waste Management Strategy in 2011 has created a goal of improving resource recovery and a carbon neutral waste sector. It sets out a strategy of 'reduce and reuse' to achieve resource recovery rates of over 90% by 2025. Since the introduction of this strategy there are continued shortfalls in achieving these goals, accelerating the need to create a direction towards organic waste recovery.

The 2018 Waste Feasibility Study Roadmap recommended the implementation of a composting facility within the ACT that is capable of processing both food and garden organics. This identified that there was a clear opportunity to significantly reduce the volume of food waste from households that ends up in landfill.

More recently a directions paper prepared in June 2020 considered a range of high-level options for processing technology and feedstock for treating household FOGO waste. The subsequent Feasibility Study of these options issued in November 2020 has further led to the development of this business case. This business case summarises the approach taken to select the preferred option, and details the economic, financial, and commercial assessment, as well as preferred procurement approach.

2.1.2. Site identification

Site selection

For the purpose of the business case, ACT NoWaste is proceeding on the basis that the facility will be built at a site within the Hume Resource Recovery Estate precinct. In 2017 Pitt & Sherry undertook a Stage 1 Site Selection Investigation within the ACT and surrounding NSW local government areas for the placement of an organics recycling facility with up to 300,000tpa processing capacity. Outcomes of the investigation identified areas of suitable land within surrounding NSW local government areas offered potential sites for an organics recycling facility. However, further analysis by ACT NoWaste excluded these sites from further investigation on the ground of transport greenhouse gas emission not meeting the Territory's net zero emission targets and complexities with NSW planning and approvals pathway. Other strategic consideration of an ACT facility for the long term included

ACT NoWaste has identified a viable project site with a footprint that enables growth over time to treat up to 70,000 tpa of FOGO feedstock. It is key to note that the anticipated delivery model, DCMO, has the flexibility to consider supporting a service contract structure that could include a different location, depending on its ability to achieve best outcomes for the ACT Government.

2.1.4. Scope of services

This scope of services includes the delivery of a FOGO processing facility, specifically an IVC facility, delivered through a DCMO. The proposed services include:

- Design and construction of a fit for purpose IVC facility.
- Long-term private sector operations and maintenance of the IVC facility.
- The production and sale of compost output from the processing facility for meaningful land rehabilitation.

This Business Case has been prepared on the basis of the Territory developing a greenfield organic waste processing facility.

2.1.5. Project Assumptions and Dependencies

Financial and economic modelling conducted to support this business case has assumed to following key parameters:

- Total capacity of 50,000 tpa
- A project term of 21 years, comprising a one-year construction term and 20-year operating period
- The project would be developed on ACT NoWaste's identified site, with the site to be provided to the project developer for a peppercorn rent for the duration of the project term
- For the purpose of the value for money analysis, a DCMO delivery model, integrating the construction and operations into one contractual arrangement with a project developer
- Revenues from the sale of compost produced at the facility to be realised by the project developer, and a resultant reduction in the subsidy required from government, with the developer to bear all sales volume risk, and
- A guaranteed volume of feedstock at 42,000 tpa.

The key interdependency for this business case is the collection services required to provide the necessary feedstock for the FOGO facility. The business case for FOGO collection services is separate to this funding proposal and will detail a cost increase due to additional green bin collection which is expected to offset the red bin collection reducing in frequency to fortnightly collection. The costing accounts for a mandatory FOGO collection, increasing from the current opt-in green bin service of around 55% take up rate, to 100% in 2024. A summary of the household service contract is at Section 1.6. The collections business case aims to continue to be rolled out across Canberra, achieving full FOGO coverage from late 2024.

Disclaimer: *This review does not represent an endorsement or agreement by the signing officer as to the contents of the section or a certification that the work was correctly performed.*

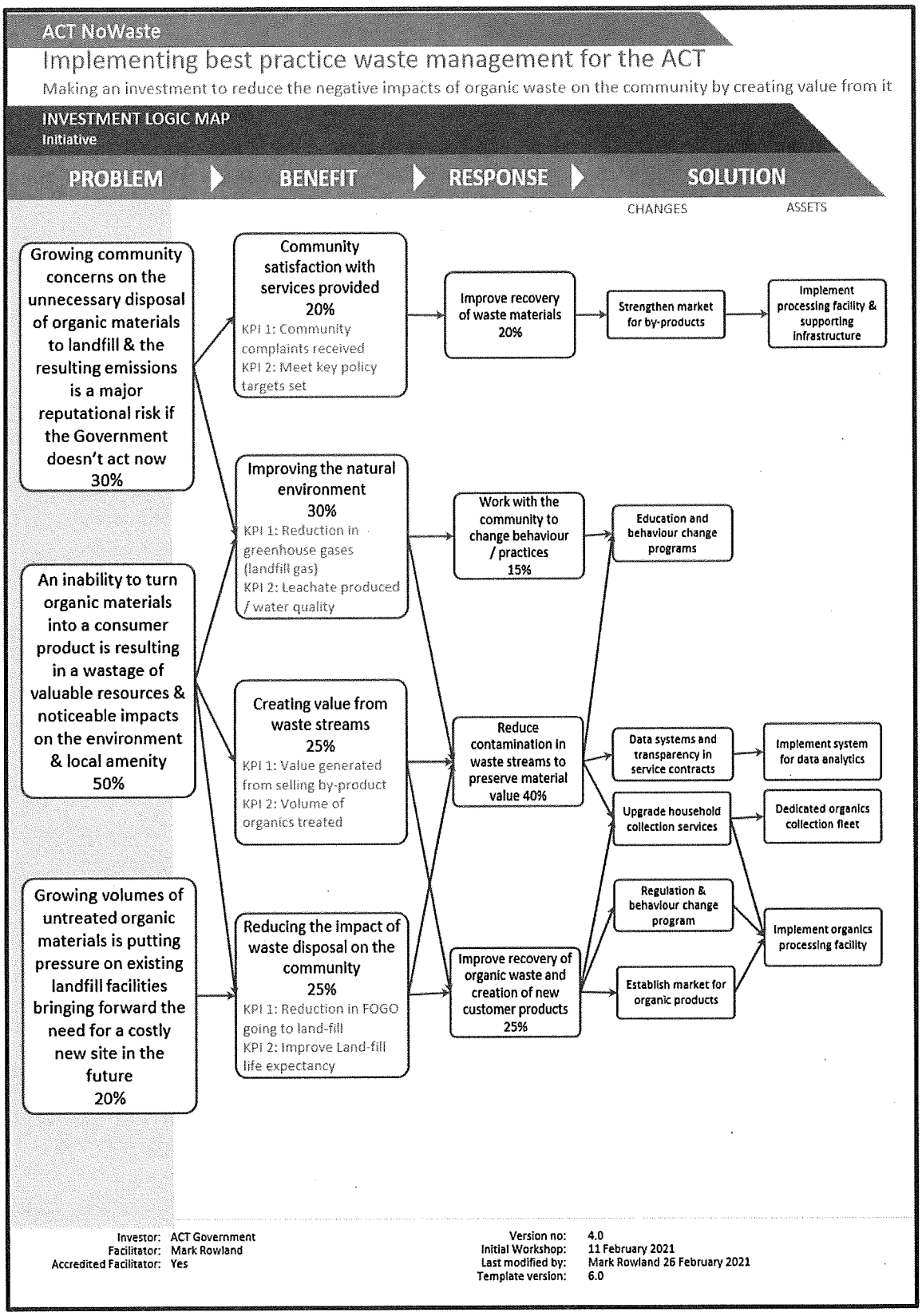


Figure 1: Investment Logic Map

doing the right thing and saving the planet. These responses and level of community engagement show the support, urgency and expectations for the government to execute actions centred on climate change.

ACT Government Climate Change Strategy and Waste Feasibility Study

Recognising community concerns, the ACT's *Climate Change Strategy* 2019-25 includes actions to avoid and manage waste supported by a set of ambitious, yet achievable goals. The actions in Goal 6 (Waste Avoidance and Management) identified opportunities to reduce overall emissions from organic waste treatment.

The value of resources and embodied energy in waste is a missed economic opportunity, as indicated in the National Waste policy, Australia, [5] and its management attracts significant community interest. For example, community engagement and support for the development of the ACT Government Climate Change Strategy played a major role in shaping its actions and targets. A total of 226 suggestions were put forward by the community regarding waste matters with over 92% focused on diverting organic waste from landfill for beneficial re-use.[6]

Similarly, there were various suggestions related to managing landfill waste, providing incentives for households to reduce organic waste, implementing a ban on food wastages by commercial and industrial sectors, and lowering Australia's emissions profile.

A 2014 audit estimated that around 35% of household general waste is food and 10% is garden waste. Food organics represents the single largest proportion of waste in household garbage bins. Emissions from landfill in 2017-18 were 60.7 kt CO2 -e, representing 2.2% of total emissions. From 2020, once electricity emissions are near zero, waste treatment is predicted to account for 4% of emissions. [7]

[5] Australian Government, *National Waste Policy*, 2018 retrieved from https://www.environment.gov.au/system/files/resources/d523f4e9-d958-466b-9fd1-3b7d6283f006/files/national-waste-policy-2018.pdf

[6] ACT Government, *ACT Climate Strategy Engagement Report*, July 2018

[7] ACT Government, *ACT Climate Change Strategy 2019 – 25*, 2019

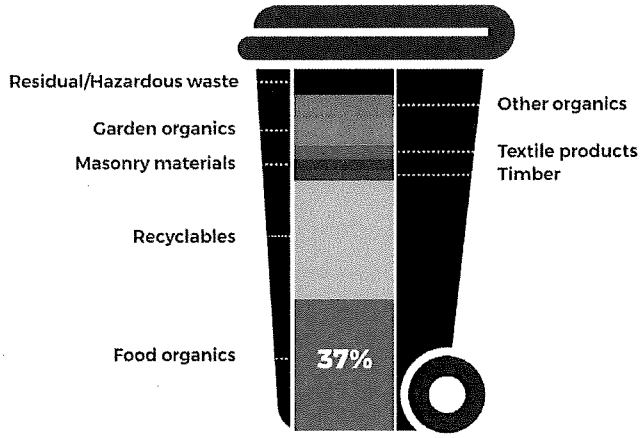


Figure 3: Typical red-bin content[10]

Waste disposed of at landfill can produce toxic chemicals that are harmful to soil, whereas composting has proven to be a safer method of waste management subject to feedstock quality. The by-products of composting contain compounds that can be transformed into biofertilizers and soil amendments. Composting also protects ground water from pollution such as leachate that results from landfilling.[11] This can help reduce health and environmental impacts.

As such, the better management of organic waste is an opportunity to move from a linear economy to a circular value chain model. This lost value was assessed in a study conducted for the Environment Protection Authority (EPA),[12] which found the economic and environmental value of waste increases as the proportion of organic processing does. There is also an opportunity for increased employment opportunities, with the National Waste Policy, 2018 report[13] estimating the following figures.

Table 10: Estimated value of waste to the economy

Item	Value
Value of Waste management services	$ 12.6 Billion per annum
Sales of recovered materials	$ 2.9 Billion per annum
Waste related activities adds a total value to the economy	$ 6.9 Billion per annum
For every 10,000 tonnes of waste recycled	9.2 jobs created

[10] ACT Government, *Overview: A roadmap to improved resource recovery, Waste Feasibility Study*, 2018 retrieved from https://s3.ap-southeast-2.amazonaws.com/hdp.au.prod.app.act-yoursay.files/3015/2582/3028/WFS_overview.PDF

[11] MDPI, *Waste management through composting: challenges and potentials*, 30 May 2020 retrieved from https://www.mdpi.com/2071-1050/12/11/4456

[12] Environment Protection Authority (EPA), *Organic waste economic values analysis*, 2002

[13] Australian Government, *National Waste Policy*, 2018 retrieved from https://www.environment.gov.au/system/files/resources/d523f4e9-d958-466b-9fd1-3b7d6283f006/files/national-waste-policy-2018.pdf

Emissions have increased to a level of +21% in 2018, making the 2020 target of -40% difficult to achieve. To meet the ambitious targets of 50 – 60% by 2025, further action is essential. This requires government to work closely with communities and businesses to find new ways to reduce emissions.

Timing Considerations

The ACT government has some of the most aggressive emission targets observed across Australia and globally, with the Territory targeting net zero emissions by 2045. Landfill life, community concerns, and government commitments creates a timing impetus to move the project forward particularly given this project aligns with the government's strategy of reducing its net emissions.

Additionally, the following targets and commitments are driving factors for investing in organic waste processing:

- The ACT Emission Reduction Strategy, as mentioned in Problem 2, to reduce approximately 60% of current greenhouse gas emissions by 2025
- The ACT Government commitment, under the ACT Climate Strategy 2019-2025 "to introduce a food and garden waste collection for all households (including multi-unit dwellings) from 2023, and support with an education program from 2020"
- The need to move the ACT towards the 90% resource recovery target (by 2025) set in the Waste Strategy
- Election commitments as per the ACT Labor policy reform, Item 9.2: "Roll out a household food waste collection service by 2023, starting with a pilot program in Belconnen"
- UN SDG Target 12.3, which calls for halving per capita global food waste at retail and consumer levels, and
- National Food Waste strategy to halve food waste by 2030

3.2 Benefits

3.2.1. Benefits to be delivered

The project presents the ACT with an opportunity to develop and implement innovative solutions to an evolving waste market in Australia and leverage learnings from overseas and across the country.

The ILM process identified four key benefits from best practice waste management in the ACT, these are outlined below.

Benefit 1: Community satisfaction with services provided
One of the issues identified by the ILM is the growing awareness of the community towards the need for more sustainable waste disposal practices. The community in the ACT is generally educated and transient, and is seeking better resource recovery solutions, similar to what they have experienced in other states. The proposed approach, being higher in the waste hierarchy, will recognise and respond to their concerns.

amendments or natural fertilisers, in turn creating revenue opportunities. These opportunities are higher in the in the waste hierarchy, as shown in the figure below.

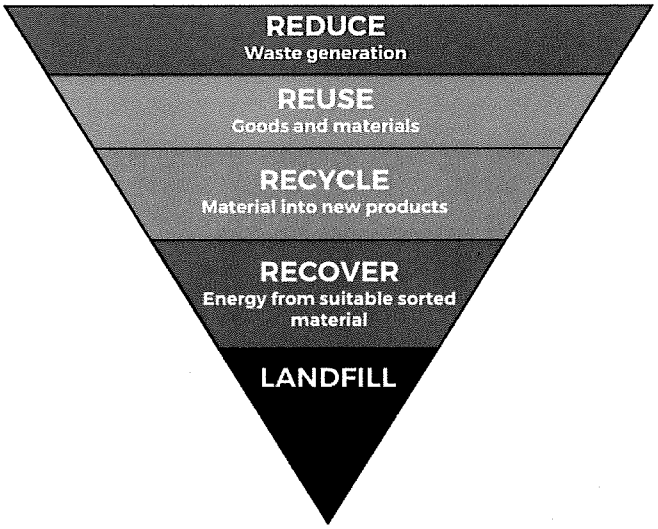


Figure 5: The Waste Hierarchy

Additionally, as outlined in the 2018 Roadmap to Improved Resource Recovery (Figure 6), diverting organics from landfill helps set the path to achieving the Territory's 90% resource recovery target.

Table 11: Benefits Realisation table

Benefits	Response	Solution	Key Performance Indicators (KPIs)
Community satisfaction with services provided	Improve recovery of waste materials	1. Strengthen market for by-products 2. Implement processing facility & supporting infrastructure	KPI 1: Community complaints / feedback KPI 2: Meet key policy targets set
Improving the natural environment	Work with the community to change behaviour / practices	1. Education and behaviour change programs	KPI 1: Reduction in greenhouse gases (landfill gas) KPI 2: Leachate produced / water quality
Creating value from waste streams	Improve recovery of organic waste and creation of new customer products	1. Regulation & behaviour change program 2. Establish market for organic products 3. Upgrade household collection services 4. Implement organics processing facility	KPI 1: Value generated from selling by-product KPI 2: Volume of organics treated
Reducing the impact of waste disposal on the community	Reduce contamination in waste streams to preserve material value	1. Dedicated organics processing facility 2. Data systems (including data analytics) and transparency in service contracts 3. Implement system for data analytics	KPI 1: Reduction in FOGO going to landfill KPI 2: Improve Landfill life expectancy

3.3 Alignment to Government policies

Diverting food waste from landfill is an important priority for the ACT government and is reflected in commitments around waste and resource recovery as well as the climate change policy. The ACT Government has identified diversion of food and garden organics from landfill as a key action to achieve resource recovery and emissions reduction targets, as reflected by the Parliamentary Agreement Policies. The Parliamentary Agreement Policies reinforces ACT Government's commitment to deliver an organic waste processing facility for households and business, and

Table 12: Project alignment with key planning policies

Policy	Alignment with project and ability to enhance current ACT Policy or deliver new ones
ACT Climate Change Strategy 2019-2025, *The Environment, Planning and Sustainable Development Directorate*	ACT Climate Change strategy 2019 – 2025, produced by The Environment, Planning and Sustainable Development Directorate which is a directorate of the Australian Capital Territory government, defines a goal: **Goal 6. Waste Avoidance and Management** to reduce emissions from waste treatment by three main actions: 1. Introduce food and garden waste collection for all households (including multi-unit dwellings) from 2023, and support with an education program from 2020. 2. Develop and consult on a scheme for requiring large organic waste producers such as hospitality and food retail businesses to have a separate organic waste collection mechanism. 3. Identify opportunities to reduce emissions from organic waste treatment including sewage such as through the use of anaerobic digestion and composting and investigate potential sites for organic waste processing. This business case and its implementation align well with the goals and actions of this strategy. It helps achieve these goals by the timeframes set out by the Strategy.
2018 Waste Feasibility Study Roadmap and Recommendations, *Prepared by ACT NoWaste, ACT Government*	The Roadmap recommends initiatives to move closer to 90% resource recovery through best practice waste management. The targets that align with this project are: **Group 1 – Roadmap recommendations states Diverting organics from landfill with subgroups:** • Implement a kerbside food and garden organics (FOGO) collection service aligned with the existing green bin roll-out program • Identify a site and establish an organics processing facility to process both food and garden organics

Policy	Alignment with project and ability to enhance current ACT Policy or deliver new ones
	program encourages the community to live a more sustainable lifestyle by offering a range of tools such as food waste audits, meal plans and shopping list templates, portion planners, setting optimum fridge temperature, food storage tips and further such practical resources to reduce food waste at the source i.e. households. As 26,000 tonnes of household food waste goes to landfill every year, the campaign aims to educate and raise awareness to reduce household organic waste that goes to landfill. The program will cease 30 June 2021.
Australia's Climate Change Strategy, ***Department of Industry, Science, Energy and Resources***	The Federal Climate Change Strategy is a national strategy to act on climate change, and is informed by the Foreign Policy White Paper, Australia's Aid policy and the Sustainable Development Goals. Specifically, ***Strategy 4.3 - Supporting business and industry to innovate and adopt smarter practices and technologies*** emphasises the need for new industries, practices and technologies that are more sustainable, particularly in the management of resources. The introduction of an organic waste processing facility endorses the adaptation of smarter waste practices along with a sustainable approach towards waste management, particularly when compared to landfilling.
National Food Waste Strategy, ***Department of Agriculture, Water and Environment***	The National Food Waste Strategy is a framework for action towards the reduction of food waste. The main aim of this strategy is to halve Australia's food waste by 2030. It includes the following priority areas that align with organic waste processing, including: **Priority 2 – Business Improvements** Outcome - Improvement and adoption of technologies, processes, and actions to avoid and reduce food waste. This focuses on: • Identifying areas for improvement

Policy	Alignment with project and ability to enhance current ACT Policy or deliver new ones
	Principle 4: Better Manage Material Flows to Benefit Human Health, The Environment and The Economy. • *Strategy12 – Reduce Organic Waste: Reduce organic waste, including garden and food waste, by avoiding their generation and supporting diversion away from landfill into soils and other uses, supported by appropriate infrastructure* By treating waste as a valuable resource through the diversion of organics from landfill and its resultant recycled organics this reduces environmental impacts of landfill. This contributes to improving Human Health, the Environment, and the Economy.
Parliamentary Agreement Policies 2020 ***Agreement between Labor party and Greens, represents the parties' shared commitment to serve people of ACT***	
Policy Issue 1 - The Government will seek advice on the best way to facilitate the outcomes contained in the Government's Waste Strategy to locate waste processing facilities in Hume.	References to Hume in the ACT Waste management Strategy 2011-2025 focus on developing the Hume Resource Recovery Estate (HRRE), and co-locating resource recovery facilities within HRRE. Previous attempts to attract private sector waste processing businesses to HRRE are documented in the HRRE Master Plan 2012 but have not been successful. As a result, land remains undeveloped in HRRE as of 2020. This vacant land has been identified as the confirmed location for Material Recovery Facility (MRF) upgrades and the preferred location for the FOGO processing facility, which is consistent with the intended use of HRRE to co-locate resource recovery operations.
Policy Issue 2 - Planning review process to improve and simplify the ACT's planning system	Land use planning is raised as a key issue for waste infrastructure in the Solid Waste Implementation Plan (SWIP). However, the objectives of the Planning Review as stated in the Parliamentary Agreement appear to focus on the quality, affordability, sustainability and community consultation and involvement for residential development. This will not necessarily

Policy	Alignment with project and ability to enhance current ACT Policy or deliver new ones
Greens policy platform - Set targets in ACT Government procurement for zero waste consumption and minimum amounts of recycled content	The SWIP advocates government procurement of recycled content as an important lever for supporting investment in resource recovery infrastructure that is not directly controlled by the ACT Government, particularly C&D recycling.

Strategic Option 2: Ongoing participation and support to the national food waste initiatives

Managing food waste is at the forefront of the Australian Government's agenda. Strategic dialogue is occurring at all state, territory, and local levels on promoting food waste outcomes, standards, and reducing greenhouse gas emissions. The ACT Government aims to continue to be an active member of the Working Group for the National Food Waste Strategy, contributing to the commitment to cutting the amount of food in Australia by half by 2030. This was agreed by ministers at the November 2016 Meeting of the Environment Ministers (MEM).

Strategic Option 3: Implementation of kerbside FOGO collection service which is aligned with the existing GO bin rollout program

Having an additional kerbside FOGO collection service provides an opportunity to significantly reduce the tonnes of food waste from households currently disposed of to landfill. This has significant benefits, something that was highlighted by a number of submissions from a 2017 market sounding.

The introduction of a FOGO collection service would require significant community engagement together with a comprehensive education program to ensure community buy-in for 'at source' sorting of food organics. This would also include longitudinal education campaigns, which need to be launched well ahead of full roll out as well as staged and maintained over a period of time.

FOGO services have been implemented in 38 local councils in Victoria and 26 in NSW. Other jurisdictions that have successfully implemented FOGO services include Albury, Parkes-Forbes-Bathurst, Lismore, Ballina, Grafton, Orange, Wodonga, Indigo Shire, Wangaratta, Benalla, Strathbogie Shire and Moira Shire.

At this stage, collections are being considered through a parallel business case.

Strategic Option 4: Establishing a composting facility within the ACT that is capable of processing both food and garden organics

In vessel composting is proven, simple, scalable, practical and quick to both develop and operate. There is considerable expertise in the market for offering composting facilities which can be procured through a range of commercial contracts. The ACT Government can contract to supply a minimum volume of waste, collected through the FOGO service, for processing.

This would require the need to develop a compost market which can be supported by the ACT Government contracting to purchase back a minimum quantity of compost that can be used in ACT parks and gardens or sold to the public.

- ACT does not operate waste facilities and all operations for basic recycling at drop-off centres (RDOCs), waste transfer stations and the Material Recovery Facility (MRF) are carried out by contracted entities. Technical maturity and commercial maturity of technologies in the Australian context influence the risk to facility operators and cost implications for ACT.
- The territory governance structure gives ACT direct control over provision of some public services (waste, transport, health, education), and regulatory control over private operations in the waste and resource recovery sector. The ACT intends to maximise the opportunities presented by this governance structure.
- ACT land ownership creates potential opportunities to align strategic planning, efficient development approvals and risk-reduction through contract negotiations in relation to waste facilities. Where appropriate, the ACT intends to maximise the benefits of government land ownership for siting of waste facilities and efficient, cost-effective infrastructure delivery.
- ACT has a responsibility to provide value for money in its services and contracts.
- The ACT can control costs by reducing uncertainty and risk to the processing operation wherever possible.

The detailed benchmarking and analysis of Australian and International Case Studies of FOGO Waste Treatment Facilities was completed as part of the Feasibility Study. Key issues examined included technology, rollout, contamination and compost outlets. This was used to help define options, typical size of projects, level of contamination expected and the potential for the creation of a compost market

The following sites were investigated as part of the validation exercise.

- Tweed Shire Council, NSW
- Bega Valley Shire Council, NSW
- Snowy-Monaro Regional Council, NSW
- Bunbury-Harvey Regional Council WA
- City of Sydney food waste collection trial for MUDs
- Corkhill Bros ACT
- Sacyr Compost Facility, Victoria
- UK experience with organics

Example results of the benchmarking is summarised in Table 13 below, with details of all case studies used included in Appendix F.

Table 14 outlines the project solutions considered. Technologies and outcome-led options have been listed, focusing on household organics, however, some options have been included are flexible for the future integration of commercial waste.

Table 14: Project Solutions Analysis

Scenario	Status	Rationale
In-vessel composting **Household FOGO only** **Approx. 45,000 tpa**	**Preferred**	**Meets ACT key objectives while controlling risks through:** - **Mature technology** - **Projects delivered in Australia - mature delivery and operational experience** - **Good environmental and amenity performance** - **Amenity performance and capability supports reasonable proximity to sensitive receptors, potential to reduce transport costs and emissions** - **Evidence of strong market demand for quality compost**
Dry anaerobic digestion Household FOGO only	Not preferred	Significantly higher capital and operational costs. Clean energy produced by anaerobic digestion (AD) must attract a premium to justify the more intensive processing. Alignment to decarbonisation directions for both gas and transport has been explored. While potential applications exist, reliance on other stakeholders and current valuation of renewable energy in various forms does not clearly support investment in AD.
Open windrow of aerated static pile Household FOGO only	Not preferred	Lower cost but higher amenity risks, particularly when food waste is present. Requires larger buffer zone to sensitive receptors, less ability to control odour.

Scenario	Status	Rationale
Co-processing clean green waste or woody waste streams with household FOGO	Not preferred	Commercially inefficient. Green waste and woody waste such as forestry residues can be successfully recovered through less costly methods such as open windrow composting, due to lower environmental and amenity risks. Would undermine existing, successful processing operations for clean green waste. Approx. 45,000 tpa household FOGO is adequate for a typical and efficient IVC operation.
Attraction of commercial food waste streams for co-processing with household FOGO (either AD or IVC)	Not preferred Can be accommodated in future	Expected household FOGO tonnage is adequate for an efficient and cost-effective processing operation. Arup recommend that the facility be sized to accept approximately 45,000 tpa of ACT kerbside organic from 2023, to minimise uncertainty and risk in the initial tender. Provision for expansion can be supported in the land tenure and tender specifications. ACT cannot direct commercially collected waste volumes. These would have to be attracted on a commercial gate fee basis. A range of other organics processing outlets already exist for some commercial food waste streams and preserving diversity and competition in this space is desirable. Reliance on these tonnages within baseline throughput would increase uncertainty and commercial risk regarding the scale of processing. Food waste streams from sources such as hospitals, schools, offices and food businesses pose different contamination risks and operational challenges. Reliance on these streams would very significantly increase the work required in stakeholder education and engagement to control contamination. This may not be achievable within the timelines required for household FOGO commencement. This approach strikes a more appropriate balance between securing suitable processing infrastructure for household FOGO and investigating opportunities to improve organics diversion in other sectors.
Design of AD or IVC to accept organic feedstocks from other LGAs	Not preferred	The ACT does not require additional feedstock to achieve a viable and efficient scale of processing for FOGO organics.

3.4.4. Base Case

The Base Case assumes that the ACT Government does not introduce compulsory household FOGO collection and processing facility. In this case the ACT would continue only using an opt-in service for green wase, and food waste in the general rubbish bin. Additional options include the provision of information and/or minor funding to support community gardens and home composting for enthusiastic members of the community.

Additionally, the ACT Government are trialling FOGO for 5,000 households to:

a.) deliver a service that replicates and tests a recommended industry collection model;

b.) successfully engage the community on the future FOGO collection service;

c.) gather data and lessons learned to inform the city-wide rollout;

d.) process the collected materials into a beneficial reuse product; and

e.) successfully lead into the city-wide rollout of household FOGO collections.

Investigations are underway to determine whether this could be achieved at the existing garden organics collection site at Mugga Lane. This however cannot be scaled up to a large scale. This maintains the status quo and would not progress any of the objectives or policy guidance for the ACT Government. However, this option would also not impose any additional costs.

3.4.5. Recommended Project Solution

Preferred Project Solution

- In-vessel composting
- Household FOGO

In-vessel composting focusing on ACT household FOGO feedstock is the preferred option for the procurement process. In-vessel composting focusing on ACT household food and garden organics delivers on ACT objectives for resource recovery and emissions reduction, while managing environmental and commercial risks through the use of mature, controlled processing technology with a track record of project development in Australia. The ACT does not require additional feedstock to achieve a viable and efficient scale of processing for FOGO organics, however it is anticipated that the size of the facility may enable an operator to attract quantities of commercial feedstock which will be complimentary to the operation. Whilst contamination will be a major focus for all feedstocks this will need to be managed appropriately depending on source. Different strategies will be required when contracting with commercial clients. Notwithstanding this, it is not anticipated to present any significant issues with respect to compost production and quality.

The Directions paper identified in-vessel composting as the preferred organics processing technology for the ACT, based on the objectives, constraints and risk appetite for the Territory. The value of renewable energy in various forms was investigated but found to be below the level which would be needed to justify more complex and costly dry anaerobic digestion options for FOGO material, while the lower level of control over odour and amenity in open-windrow composting was undesirable given the metropolitan context of the ACT and the Territory's desire to offer ACT-owned land as a potential site during the procurement process.

Table 15: Components of IVC project cost

	Components	Capex/opex	Comments
Development costs	• Design • EIS process requirements • Permitting and licencing, including both waste and environmental licencing conditions.	Factored into capex	Permitting risk borne by ACT for ACT-owned site although sometimes undertaken by developer and part of tendered scope of work.
Utilities	• Electricity – supply only • Water – supply only	Connections: Capex Consumption: Opex	Water storage and recycling onsite. Non-potable water supplies considered.
Civil Infrastructure	• Buildings – receival hall, processing sheds, site offices • Roads • Pavements • Weighbridges • Offices • Amenities • Lighting • Leachate tanks • Water Tanks • Fire Services • Biofilters / Air scrubbing	Capex Maintenance: Opex	
Fixed plant and equipment	• Shredders • Conveyors • Screens • Grinders • Composting tunnels • Fully enclosed maturation process area including air delivery systems	Capex Maintenance: Opex	Fixed components sized for maximum expected throughput.

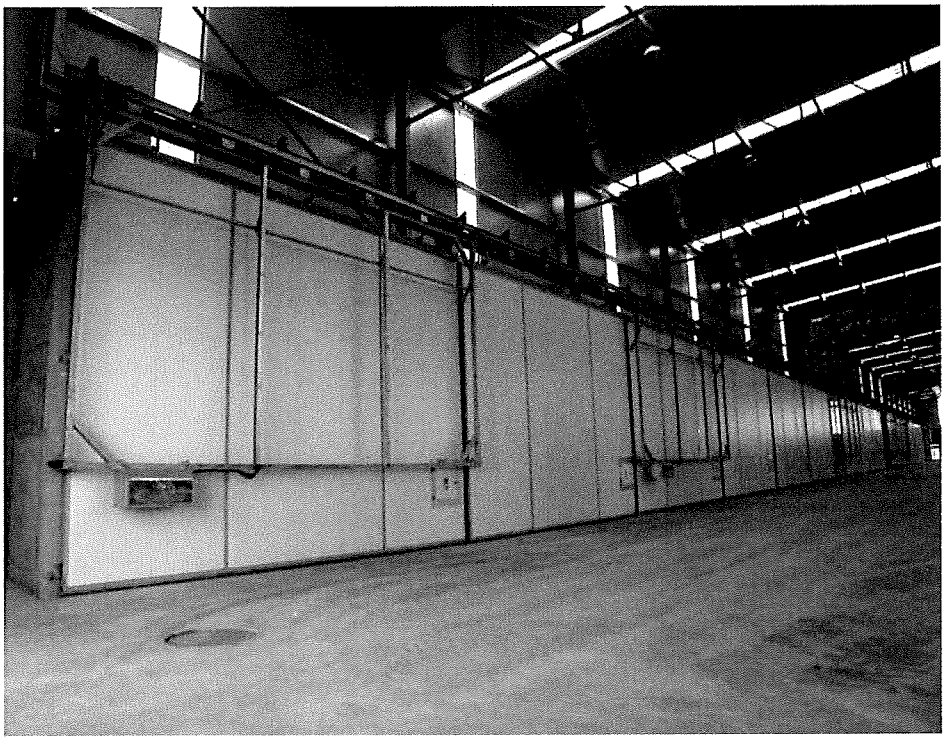


Figure 7: Example of a composting tunnel, external view. Image supplied by technology composting provider Christiaens

Figure 8: Example of a composting tunnel, internal view. Image supplied by technology composting provider Christiaens

4. Cost & Contingency

This section outlines the methodology and approach used to estimate capital costs, operating costs, project and delivery model contingency. The following chapter outlines:

- Benchmarking analysis that has been used to form the basis of estimated costs for the FOGO facility
- Detailed assumptions for capital and operating costs
- Approach undertaken to estimate project and delivery model contingency
- Overall Budget and funding strategy

4.1 Benchmarking Analysis

The capital and operating costs for the FOGO Facility have been estimated using a benchmarking analysis of the following:

- Recent tenders for a comparable waste project in NSW
- Publicly available information on domestic and international IVC facilities

The capital costs for this project are estimated to be [redacted] per tonne. This comprises development, construction, major maintenance, contingency costs as well as operator profit margin.

Operating costs amount to [redacted] per tonne, which consists of staffing, education, maintenance costs and operator profit margin. The public information market benchmarks used exclude staffing and insurance costs, therefore for the purpose of this benchmarking analysis we have excluded staffing and insurance from the project benchmarks. Operating costs excluding staffing and insurance for the facility is [redacted] per tonne, as show in Figure 11.

Capital costs are sensitive to build quality and the technology solution applied. The build quality presented in this business case is assumed to be best practice tunnel design and processing (highest amenity and limited impact). Based on our analysis and wider project experience, there are limited facilities in Australia with similar technology to compare as the market is simply less mature than overseas. This means that some benchmarks found are not as relevant to this project. In order to reflect the best-in-class technology, high quality solution and the context that an Australian company will be providing the integration works (which means high labour costs when compared to other countries), a higher cost estimation benchmark has been used. Figure 10 and Figure 11 shows CAPEX and OPEX rates on a per tonne basis for the FOGO capacity in comparison to the other benchmarks.

throughput in a smaller tunnel. This means lower overall construction costs, but the quality of the end product may not be as high.

- Parameters – Tenderers proposed slightly different methods of tunnel construction, flow rates of air and water, thus leading to variation in costing.
- Material quality – Different costs of processing equipment were proposed based on build quality and supplier.
- Contamination removal – Different configurations for contamination removal equipment (pre processing)
- General variance in company costing structures.

Company A's design solution was considered to align best with the design for this Project and therefore this Project was benchmarked against Company A's tender costs. Company B and C's cost structure was considered to be incomplete and unreliable, especially for OPEX, and therefore were not considered as reliable data points for consideration.

In addition to the tender information, a range of publicly available information were sourced to assess the range of capital and operating cost ranges on a per tonne basis. Key reports that were used include:

- Wrap, *Realising the value of organic waste* (2008)
- Arcadis, *Assessment of the options to improve the management of bio-waste in the European Union* (2009)
- ACT Government, *Economic Modelling of Options for Waste Infrastructure in the ACT* (2010) Sustainability Victoria, *Biological Recovery of Organics (2017)*

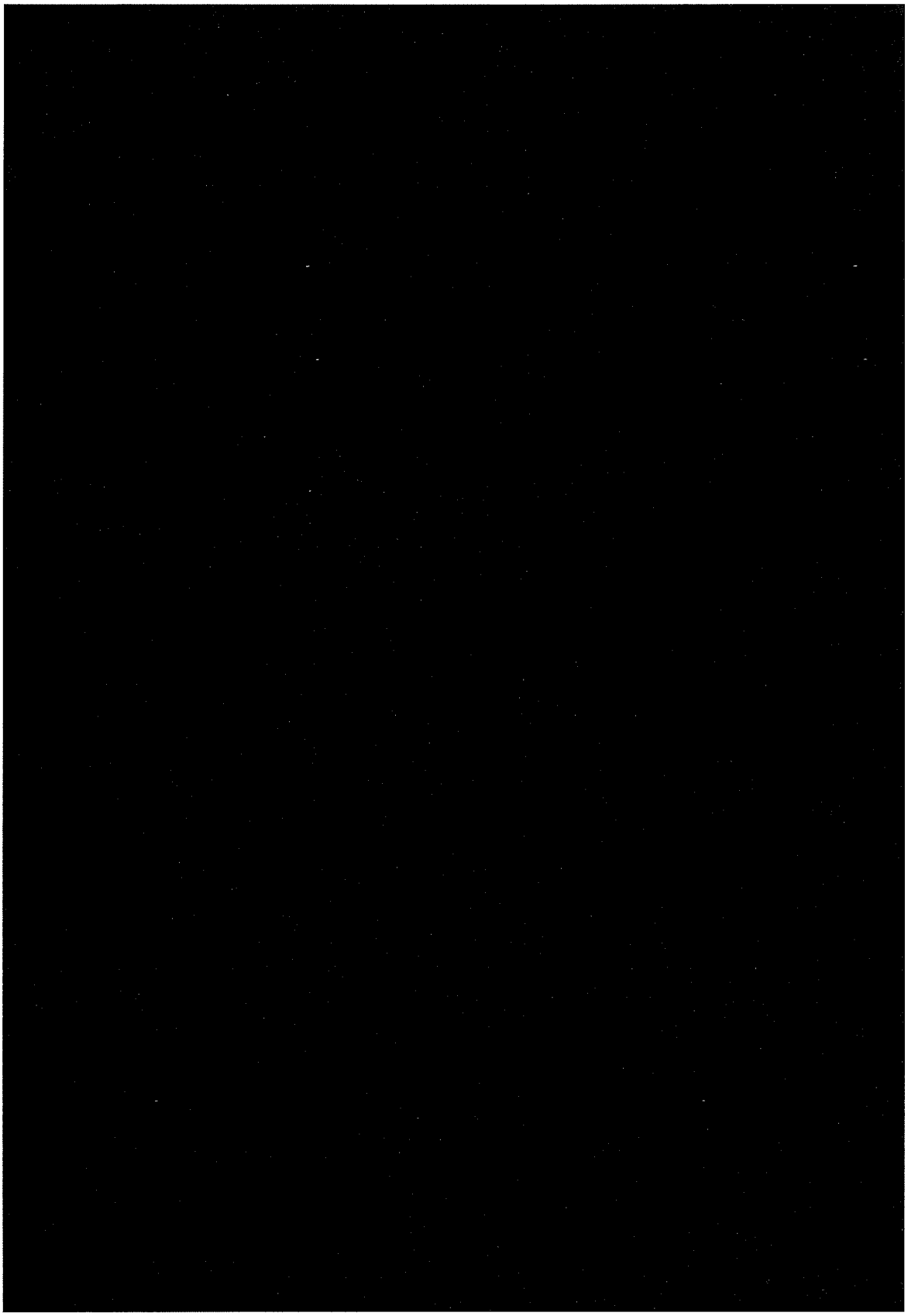
It is important to note that the parameters sought from publicly available information lacks sufficient transparency on the exact technology, build quality, and the majority of data points are from outside of Australia, and therefore cannot be accurately relied upon for appropriate comparison. The cost parameters of overseas facilities will be significantly lower than has been estimated for this project, as labour in Australia has approximately a premium of 30% to 40% in comparison to international benchmarks.

Due to the high build quality and best in class technology proposed for this project, there is insufficient relevant benchmarks that can be used and therefore a higher benchmark in comparison to the tenders and public information has been sought. Detailed assumptions underlying the capital and operating costs are discussed in Section 4.2.

4.2 Preliminary Cost Estimate

4.2.1. Capital Costs

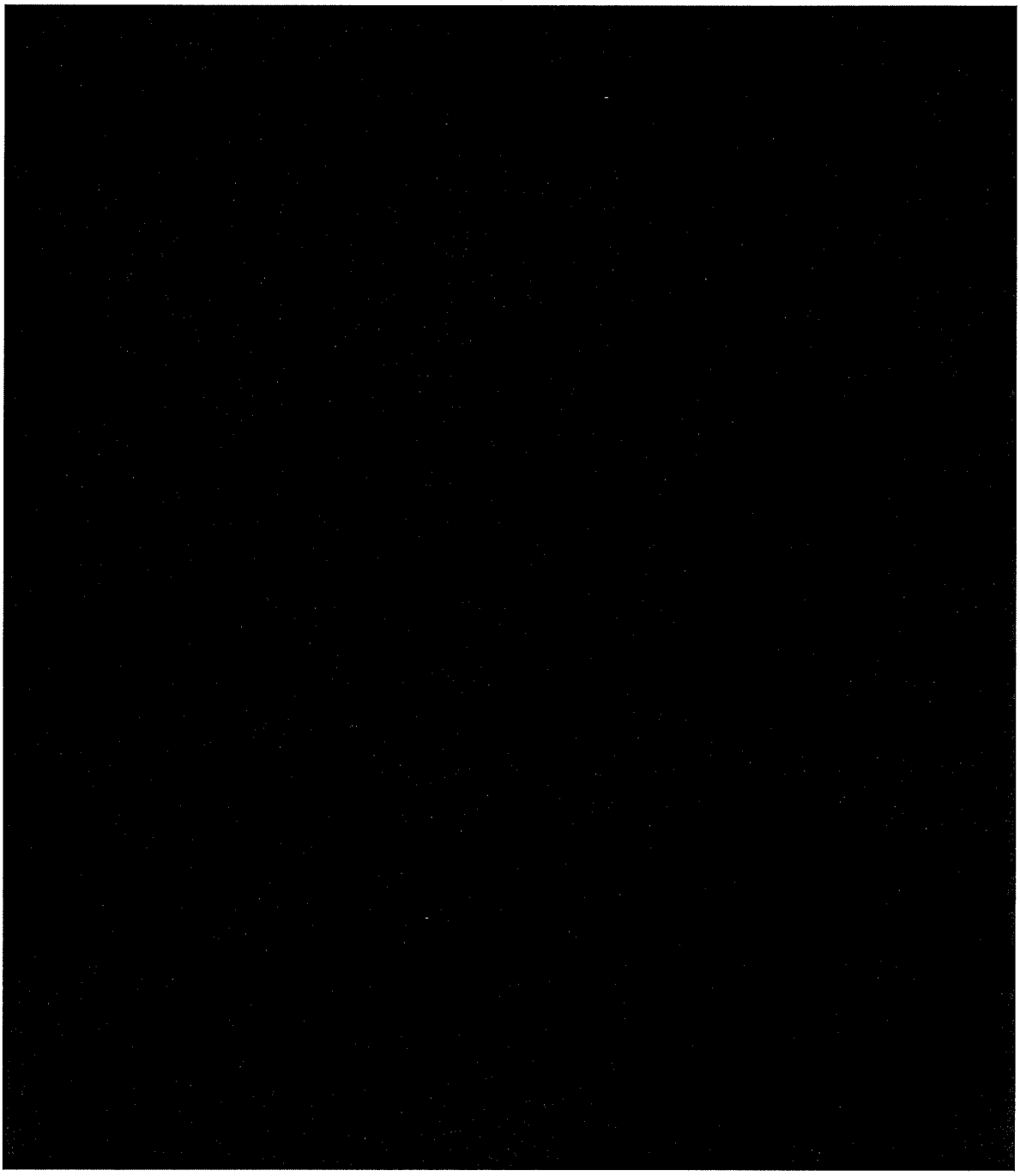
The estimated capital costs (excluding risk adjustment) for the project are summarised in Table 16.



Project operational costs are the costs incurred in the day-to-day operations and maintenance of the facility. The table below sets out each of these parameters alongside a broad description as to how they were devised.

The costs are preliminary and would be firmed up through the tender process within the contracting methodology with a fixed price scoping approach to O&M services. Note that lifecycle maintenance has been included in the capex section of this report.

Table 20: Detailed assumptions for operational costs



Contingent risks are generated from the outputs of the risk register (Appendix C) which involves a qualitative and quantitative assessment of each risk. This assessment provides a likelihood and severity rating for each risk based on assumptions and credible scenarios which is then used to develop the inputs into the Monte Carlo simulation.

The development of the risk register was conducted by key stakeholders and project group members to ensure that all risks are captured, likelihood and impact are calculated, and potential mitigation strategies considered.

A total of 35 risks were considered in the risk register, 15 have been quantified through the Monte Carlo simulation. The quantified risks assessed through the Monte Carlo assessment are summarised in the table below. Additionally, whether the cost or revenue drivers are impacted by the risk has also been identified.

Table 21: Risk quantified through Monte Carlo simulation

4.4 Budget / Funding Strategy

This section sets out the budget impacts of the preferred option. A budget impact statement analyses the budget impact of the proposed project (savings and costs) and implications for the Directorate including additional staff, equipment or any financial impacts on other Directorates that are not included in the financial model.

Under a DCMO, the government will finance the project in full. Payments to the contractor, which include a profit margin, will be made according to an agreed schedule. Separate schedules will be in place for the construction and operational phases of the project but included in the same contract.

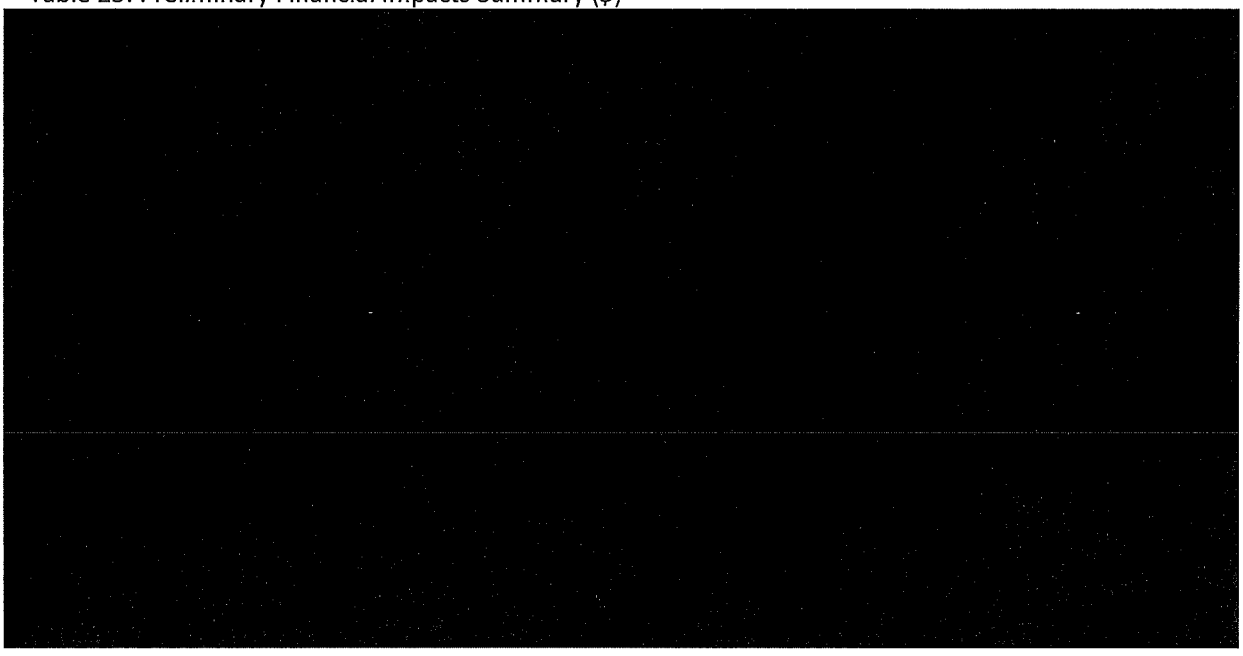
Capital payments are assumed to commence on 1 April 2022 prior to construction to enable the contractor to complete design and planning works. Capital payments will continue until the end of the construction period. Funding has been provided in the 2021-22 Budget to undertake the Environmental Impact Statement (EIS) process and early preparation of term sheet for the DCMO procurement.

Similarly, payments to the contractor will be made during the operating period according to an agreed schedule. These payments will continue until 2044, the end of the operating period. The exact schedule for payments will need to be negotiated with the contractor.

Government lawyers and/or external lawyers will also be required. Cost associated with other technical advisors required for the development of the project are included in the project capital costs. Once operational, staffing impacts will be minimal and only required to ensure contractor performance and compliance as well as to facilitate payment.

The following preliminary financial impact summary is for a DCMO delivery.

Table 23: Preliminary Financial Impacts Summary ($)



5. Economic Analysis

The project realises a number of benefits, including economic, social and environmental benefits. To capture these an analysis' have been undertaken.

- Cost Benefit Analysis
- Social Analysis
- Environmental Analysis
- Wider Economic Benefits

The following table summarises the key project benefits, with only the economic benefits assessed quantitatively.

Table 25: Project Benefits

Category	Benefits
Economic Benefits (CBA)	• Reduced Greenhouse Emissions • Delayed landfill investment • Reduction in leachate treatment costs
Social Benefits	• Employment • Health and wellbeing
Environmental Benefits	• Methane emissions reduced • Improved water quality • Enhanced soil quality
Wider Economic Benefits	• Improved agriculture productivity • Contribution to the circular economy

Table 27: CBA Key Parameters

Element	Category
Discount year	FY 2021
Discount rate	[redacted]%
Price base year	FY 2021
Operations start date	1 August 2024 (DCMO)
Evaluation Period	30 years

5.1.1. Methodology

Reduced Greenhouse Gas Emissions (GHGs)

The project's ability to reduce GHGs, particularly methane was assessed using the National Greenhouse Accounts Factors for landfill and the biological treatment of solid waste. GHGs were measured as the incremental benefit of the FOGO facility above or below the base case, landfilling the waste. It was assumed for the economic analysis that feedstock would comprise approximately 70% garden organics and 30% food organics.

The social cost of carbon (SCCC) has been assumed as $20/tonne, taken from the ACT Government Climate Change Strategy 2019-2025, and seen as an appropriate value given the project represents a Government initiative to reduce emissions. The social cost of carbon has been adjusted over the operating period of the FOGO facility to consider the expected increase in the willingness to pay for carbon initiatives in the future, and the need to maintain zero net emissions. Using taking the mid-point of $65 / tonne reported in RepuTex modelling of the carbon offset price in 2040 (assumed to $30-100/tonne), a YOY growth rate of 6.4% to the cost of carbon has been applied.[20] As there is some uncertainty in this, sensitivities have been included in the economic analysis of the future price of carbon,. Both $30 and $100 per tonne have been tested.

The base case calculates the methane (MH_4) emissions using the conversion factors summarised in Table 28 below. It also assumes that 75% of methane is captured. This capture rate is assumed to be appropriate as insufficient information is available on the landfill. Additionally, it is difficult to estimate the capture rate over the whole of life of a landfill facility, and therefore a 75% capture rate is considered the most reasonable measure based on technical advice.

[20]ReputTex Energy, 2020, CO2 offset price of $30-$100/t in 2040 for Australia to reach and maintain net-zero emissions. Retrieved: https://www.reputex.com/research-insights/co2-offset-price-of-100-t-for-australia-to-reach-and-maintain-net-zero-emissions/

landfill development. Based on the proposed FOGO facility capacity, it has the potential to defer the need for a new landfill by five years by 2050.

This value of delayed investment is captured through discounting the landfill remediation and capital costs when incurred in 2050 or 2055. The cost of landfill closure has been taken from the 2009 Department of the Environment, Water, Heritage and the Arts paper on landfill costs, originally sourced from the WMAA National Landfill Division in 2006. Cell development has been used as a proxy of cell treatment during closure and rehabilitation, which has been added to capping and aftercare, bringing the total cost of closure to $11 / tonne (2006). The total volume of feedstock has been used as proxy of total tonnes remaining in the Mugga Lane Landfill. It is key to note that this is not the total capacity of the landfill, as this is not provided, however, is used as a proxy to understand the potential economic value of delay.

Table 30: Estimated costs for large best practice landfill in Australia (Source: Waste Management Association of Australia (WMAA) National Landfill Division in PC 2006 and WCS unpublished)

Type of cost	Cost per tonne of waste (WMAA) - $2006
Cell development	$6.5
Capping and rehabilitation	$2.5
Aftercare	$2
Total Cost	**$11**
Volume treated	
Volume	40,000 tonnes

Reduction of leachate

Leachate is a liquid that passes through solid waste, that has been contaminated by a range of compounds or toxins, including organic waste, which creates significant externality costs.[21] By re-directing compost from landfill, this environmental impact can be mitigated and cost reduced. The external cost of leachate has been taken from the 2006 Australian Productivity Commission Report, accounting for the risk that leachate will damage human health and the environment. This external cost has been taken as $1 per tonne (2006) and escalated to 2021 values for the economic analysis.

5.1.2. Results

Table 31 summarises the results from the Cost Benefit Analysis. The economic analysis shows that the project is anticipated to create economic value for the Territory, with a BCR of **0.56** with a 7%

[21] Australian Productivity Commission (2006), Waste Generation and Resource Efficiency