



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) FY22- FY25:	██████ (nominal, risk adjusted)
	██████ (includes admin fees)
Capital Appropriation Requested FY22- FY25:	██████ (nominal, risk adjusted)
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

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Reviewing Officer, Infrastructure Finance and Reform,
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Sign Offs

Requesting Directorate:

Document in order to proceed

IFR

MPC:

FABG:

Document in order to proceed – CMTEDD Sign-offs complete

Contents

1.	Executive Summary.....	6
1.1	Statement of Need.....	6
1.2	Project Solution.....	7
1.3	Delivery Model.....	8
1.4	Funding Approval Sought.....	9
1.4.1.	Type of funding sought	9
1.4.2.	Cost Estimate	9
1.4.3.	Contingencies Included	10
1.4.4.	Cost to Government	11
1.4.5.	Incremental Procurement/Transaction Costs	12
1.5	Treasury Budget Summary.....	12
1.6	Household Waste Collection.....	13
1.6.1.	Method of delivery	15
1.7	Stakeholder engagement.....	16
1.8	Next Steps.....	16
2.	Project Outline.....	18
2.1	Description of the Project.....	18
2.1.1.	Overview	18
2.1.2.	Site identification	19
2.1.3.	Scope of works	20
2.1.4.	Scope of services	20
2.1.5.	Project Assumptions and Dependencies	20
2.2	Review 1 (IFCW): Status of Functional Brief/Output Specification.....	22
3.	Needs Analysis.....	24
3.1	Problem.....	24
3.1.1.	Evidence of the Problem	26
3.2	Benefits.....	31
3.2.1.	Benefits to be delivered	31
3.3	Alignment to Government policies.....	35
3.4	Options Analysis.....	44
3.4.1.	Strategic Solutions Analysis	44
3.4.2.	Recommended Strategic Solution	46

3.4.3.	Project Solutions Analysis	46
3.4.4.	Base Case	53
3.4.5.	Recommended Project Solution	53
3.5	Review 2 (Treasury): Needs Analysis	58
4.	Cost & Contingency	59
4.1	Benchmarking Analysis	59
4.2	Preliminary Cost Estimate	61
4.2.1.	Capital Costs	61
4.2.2.	Operational Costs	64
4.3	Contingency	66
4.4	Budget / Funding Strategy	69
5.	Economic Analysis	71
5.1	Cost Benefit Analysis	72
5.1.1.	Methodology	73
5.1.2.	Results	75
5.1.3.	Sensitivity Analysis	76
5.1.4.	Social Analysis	77
5.1.5.	Environmental Analysis	79
5.2	Wider Economic Benefits	79
6.	Delivery Model Analysis	82
6.1	Outline of Key Risks	82
6.1.1.	Commentary on risk	88
6.2	Commercial Principles	88
6.3	Delivery Model Assessment	92
6.3.1.	Data Gathering	92
6.3.2.	Market Soundings	93
6.3.3.	Delivery Model Short-List	96
6.4	Recommended Delivery Model	97
6.4.1.	Food Waste for Healthy Soils Fund	99
6.5	Review 3 (IFCW): Delivery Model Selection	99
7.	Financial Analysis	101
7.1	Delivery Model Structure	101
7.2	General Assumptions	102

7.3	Pre risk adjusted financial outcomes	107
7.3.1.	Compost revenue	109
7.4	PPP/DCMO Payment Stream	112
7.5	Incremental Procurement/Transaction Costs.....	113
7.6	Public Sector Comparator vs. DCMO	113
7.7	Review 4 (Treasury): Financial (PPP/DCMO only).....	115
8.	Project Governance.....	116
8.1	Key Stakeholders / Governance Groups	116
8.2	Governance Framework.....	118
9.	Stakeholder Engagement Plan	120
9.1	Stakeholder Identification.....	120
9.2	Stakeholder Involvement & Interest.....	120
10.	Advisor Engagement Plan	127
10.1	Proposed Advisors Roles.....	127
10.1.1.	Legal	127
10.1.2.	Commercial Procurement	127
10.1.3.	Commercial Financial	127
10.1.4.	Technical Design & Engineering	127
10.1.5.	Other Specialists	128
10.1.6.	Stakeholder Management and Communication	128
10.1.7.	Project Management	128
11.	Timeline.....	129
11.1	Project Timetable.....	129
11.1.1.	Outline	129
11.1.2.	Proposed float	131
11.1.3.	Project constraints and/or deadlines	132
12.	Appendices.....	133
12.1	Appendix A – Functional Brief / Output Specification	133
12.2	Appendix B – Investment Logic Map	134
12.3	Appendix C – Risk Register	135
12.4	Appendix D – Project Programme.....	141
12.5	Appendix E – Risk Management Plan.....	142
12.6	Appendix F – Stakeholder Engagement Plan	152

12.7	Appendix G – Case Studies.....	159
12.8	Appendix H – Monte Carlo simulation Output Reports.....	168
12.9	Appendix I – DCMO and PSC Cash Flows	171
12.10	Appendix J – Delivery Model Shortlisting.....	173
12.11	Appendix K – Delivery Model Market Sounding Report	184
K1.	Introduction	185
K1.1	Background	185
K1.2	Purpose of Market Engagement and this report	185
K1.3	Methodology.....	185
K2.	Key themes.....	187

1. Executive Summary

1.1 Statement of Need

The 2018 Waste Feasibility Study Roadmap and Recommendations, the 2019-20 Budget Papers for Transport Canberra and City Services, and the ACT Climate Change Strategy 2019-2025 have all identified the need for better rates of resource recovery and a move towards a circular economy. A major focus is the minimisation of waste to landfill and recovery of organic waste for beneficial reuse. Under the ACT Climate Strategy and item 9.2 of the Parliamentary and Governing Agreement for the 10th Legislative Assembly, the ACT Government has committed to roll out food and garden waste collection for all households (including multi-unit dwellings) from 2023.

To reach the emissions and waste reduction targets specified by the ACT Government, the current waste management infrastructure is insufficient. The level of organic waste being produced is continuing to rise due to factors including population growth, consumption levels and income, and increasing volumes of waste being directed to landfill. With landfill no longer considered as the best solution for organic wastes, action is required to find alternative solutions for organic waste management.

An Investment Logic Mapping (ILM) Workshop was conducted in the lead up to the development of the business case. The workshop focused on four themes that need addressing, namely: (1) the impact of waste disposal practices on the community; (2) the negative impacts of poor disposal practices on the natural environment; (3) failing to acknowledge the value that can be recovered from waste streams; and (4) community dissatisfaction with current waste disposal practices.

The disposal of organic waste to landfill has detrimental effects on the environment and community, producing landfill gas and contaminated leachate. Methane is a key contributor to climate change and is difficult to fully capture or convert to energy once landfilled. Additionally, leachate is difficult to treat and has the potential to pollute waters.

As such, the community within the ACT, which is both educated and motivated to see action towards climate change and a circular economy, is seeking initiatives from the ACT Government towards better waste management. That, in combination with high levels of waste generation due to higher median incomes in the ACT, means there is significant opportunity to better use valuable resources that are currently going to landfill.

A range of options for diversion of food waste from landfill have been identified as possible responses to these issues. The proposed solution from this Business Case involves the development 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

██████████ (FY21, real terms) is the infrastructure construction cost and ██████████ (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 for consideration in early 2022 to support the consolidation of ACT's current waste collection service contracts into a single collection contract from October 2023, 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 42,000 tonnes per annum of FOGO feedstock by 2024, 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.

This solution is expected to address the problems included in the statement of need identified in the Investment Logic Mapping workshop, through delivering the following benefits:

- Improving the natural environment
- Reducing emissions produced by landfilling organic waste
- Creating value from waste streams
- Reducing the impact of waste disposal on the community

- Community satisfaction with services provided

1.3 Delivery Model

A number of workshops were conducted with departmental stakeholders, including Major Projects Canberra and various sections of ACT Treasury in developing this business case and the proposed solution. The procedure outlined in the ACT Capital Framework, including the draft Delivery Model Guidelines, was followed.

The Delivery Model assessment identified both a design-construct-maintain-operate (DCMO) and a User Charge PPP as preferred delivery models for the FOGO facility. A further market sounding was conducted in November – December 2021 to assess market appetite for the two delivery models and to discuss the risk associated with both. A report in relation to this further market sounding is contained at Appendix K. Whilst both User Charge PPP and DCMO could be suitable delivery models for the project, it is recommended that a DCMO delivery model be pursued as the scale of the project may not be large enough to warrant the investment by consortia in a User Charge PPP solution. This is addressed further in Section 6.

As such, to demonstrate the difference in the total cost of a private sector delivery model vs. traditional government procurement, the analysis completed in the Business Case shows the outcomes under DCMO procurement compared to a traditional government procurement only.

This Business Case has been prepared on the basis of the ACT developing a greenfield organic waste processing facility. Market sounding has ascertained that it may be possible that a private sector operator could offer to build its own facility on different land to that identified by and owned by the ACT and/or retrofit an existing facility. In this case, a 'contract for services' contracting approach may be used in the form of a standard waste disposal agreement. The procurement process will be designed as a two-stage approach to enable a party to put forward any such solution in the first stage. This feedback would be used to inform the final delivery model. Any such alternative delivery option would be reliant on the private sector and is not within the direct control of the ACT, considering the extended planning process to build a facility on a land which is not identified and owned by the ACT Government. The results of informal market sounding, and the industry knowledge of both ACT NoWaste and its consultants, have indicated that there is no operational facility proximate to the ACT that is currently permitted to receive FOGO waste of the volume generated by the Territory.

The final approach may be informed by the first step in the procurement process, which is envisaged to have two stages:

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 takes into account 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 in order 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

Item	Value (\$ FY21, real)
Development capital costs	[REDACTED]
Project support costs	[REDACTED]
Construction capital costs	[REDACTED]
External utilities connection	[REDACTED]
Recycling road extension	[REDACTED]
Contractor profit margin	[REDACTED]
Total capital costs	[REDACTED]

Table 2: Operating Costs (20 years)

Operating Costs (across 20 years)	Value (\$ FY21, real)
Staff costs	[REDACTED]

Education costs	
Fixed costs	
Variable O&M costs	
Landfill costs	
Contractor profit margin	
Total operational costs	

Table 3: Annual operating cost for first full year of operation

Item	Value (\$ FY21, real)
Staff costs	
Education costs	
Fixed costs	
Variable O&M costs	
Landfill costs	
Contractor profit margin	
Total operational costs	

1.4.3. Contingencies Included

Contingency has been estimated through undertaking a risk analysis, and applying monte carlo simulation. Where possible, risk mitigation measures have been identified and are outlined in the Risk Management Plan included in Appendix E. Delivery Model Contingency has been assessed only for risks that have been quantified as part of the risk assessment, and an exercise in allocating risks between ACT and private sector has been undertaken in line with the anticipated delivery model.

The following table shows contingency applied, as well as the risk allocation under both delivery models assessed.

Table 4: Delivery Model Contingency

Cost / Revenue Driver	Risk adjustment	Risk allocation to Government under DCMO	Risk allocation to Government under traditional government procurement
Capex	uplift in overall capex	of the initial capex risk is allocated to Government	of the capex risk is allocated to Government
Opex	uplift in annual opex	of the initial opex risk is allocated to Government	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

The PSC uses a discount rate of [REDACTED] whilst the DCMO uses [REDACTED]. The discount rates have been calculated in line with the National PPP Guidelines, where the DCMO discount rate reflects the proportion of systematic risk borne by the private sector. The PSC discount rate represents the 10-year ACT Government bond rate. For a detailed methodology and assumptions used to determine the discount rates, please refer to Section 7.6 of the business case.

2. Risk adjustment (capex and opex uplift), transferred to the private sector under DCMO

PSC (Government) takes on [REDACTED] of the risk adjustment (capex and opex uplift), whilst some of the risk/uplift is transferred to the private sector under DCMO. Under the DCMO model, Government only takes on [REDACTED] of the [REDACTED] capex uplift and [REDACTED] of the [REDACTED] opex uplift. In contrast, under PSC, Government would take on 100% of the risk/uplift on both capex and opex. The uplift was

quantified through a Monte Carlo simulation where a number of risks were identified. Please refer to Section 4 of the business case for methodology and detailed assumptions for determining risk adjustment.

Therefore, the adjusted NPC cost for DCMO is lower than PSC due to higher discount rate being used and the government taking on less risk (only incurring a small portion of the capex and opex uplift).

1.4.5. Incremental procurement/transaction costs

The illustrative private sector delivery model for this project, DCMO, requires an incremental amount of government effort during the procurement period vs. traditional government delivery. 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. Costs anticipated for procurement and transaction effort have been incorporated in the analysis and are detailed in Section 4.2.1.

1.5 Treasury Budget Summary

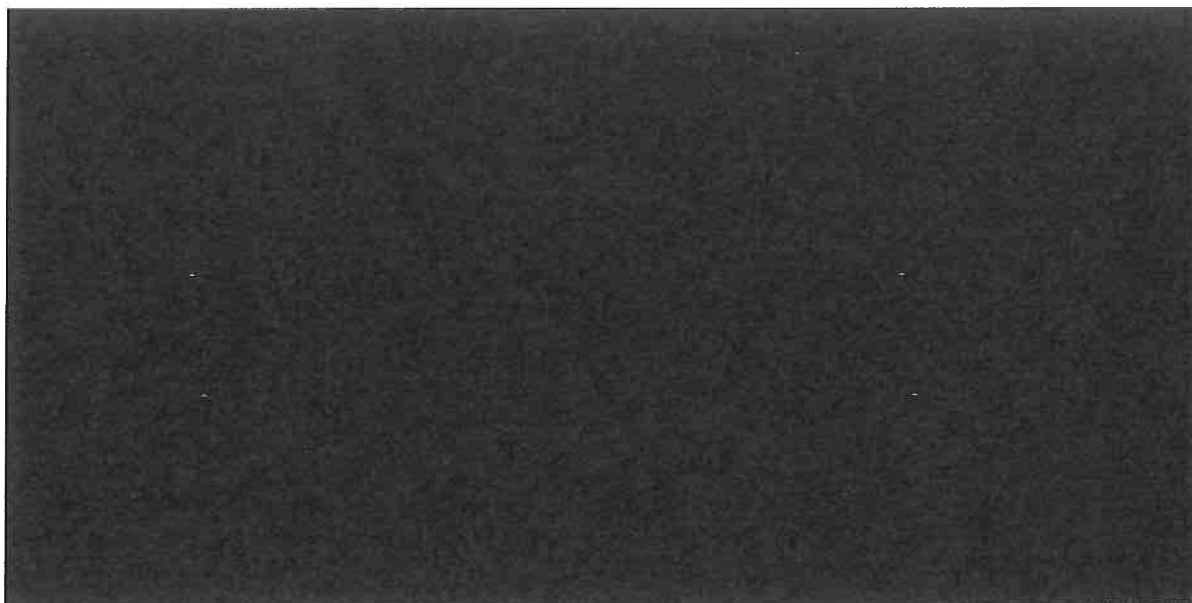
The budget impact statement includes the FOGO facility costs to the ACT Government resulting from the project excluding the collection costs (which will be defined under a separate Business Case). It includes implications for ACT NoWaste including additional staff, equipment and any financial impacts on other Directorates that are not included in the financial model.

Under a DCMO, the government will fully fund the project. Payments to the contractor, which include a profit margin, will be made according to an agreed schedule, yet to be fully determined. Payments are expected to continue until 2044, the end of the operating period. The exact schedule for payments will need to be negotiated with the contractor but are likely to be monthly.

The following preliminary financial impact summary assumes DCMO delivery.

This Business Case seeks funding for the -2022-23 and 2023-24 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. The establishment of a provision for the construction, operation and maintenance of a new FOGO composting facility and the other essential requirements to introduce the new waste collection service to households are proposed to be sought in an out-of-session decision from ERC during the 2021-22 financial year as the procurement process progresses. 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 2021)



This funding profile would see the FOGO facility completed and ready to commence operations from August 2024. This would allow city-wide FOGO collection services to commence in Q3 2024. 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 2023. Delaying a decision on the development of the FOGO facility would further delay the commencement of FOGO services beyond the end of 2024.

Table 8: Staffing impacts summary

Impact	2020-21	2021-22	2022-23	2023-24
Total additional FTEs*	Nil	Nil	Nil	Nil

1.6 Household Waste Collection

The following discussion flags issues associated with the delivery of household waste collection services, including proposed future FOGO services. This information is provided for context and will be addressed in detail through a standalone business case to be considered by Cabinet in the first half of 2022. No funding is sought at this time for this component.

Waste collection is an essential service for ACT households which must be delivered effectively and efficiently on an ongoing basis. The current household waste collection services contract for general landfill waste and comingled recycling ends in October 2023. This presents an opportunity to procure new household waste collection service arrangements for the Territory. Work is currently underway to evaluate the benefits of consolidating all collection services into one contract, as compared to the current arrangement of separate service contracts. The current separately contracted services that provide household waste collections include:

- General landfill waste (red bin), comingled recycling (yellow bin) and Recycling Drop Off Centre comingled hopper servicing
- Garden waste (green bin) collection

- Supply of Mobile Garbage Bins (MGBs)
- Bulky waste collection

ACT Government has outlined its intentions of securing local employment in the *Parliamentary and Governing Agreement for the 10th Legislative Assembly* 1. A Cabinet submission will be presented in February/March 2022 seeking agreement to either continue with the current contracted arrangements or insource household collection service. Depending on the decision from Cabinet, a business case will be presented in March/April 2022 addressing options for the continuation of essential waste collection services to households under a new collection services contract with the addition of FOGO from mid-2024, aligning with the FOGO facility delivery time.

Alternatively, if an insourced service is preferred by Cabinet, a business case will need to be developed to seek funding for a study into the necessary technical and commercial capacities, depot, vehicle and human resources, and organisation and governance requirements to transition from the current outsourced configuration into an insourced waste collections business unit. An insourced service arrangement will have a dramatic impact on the delivery timeframe for a new collections service. The work to study the necessary technical and commercial capacities would be required initially to inform the timing and transitional arrangements for the new business unit. This would then need implementation to ensure the workforce is transitioned, trained and adequately resourced for full operations. This would require extension of current contract arrangements and potentially impact the commencement of FOGO collections.

The household waste collection business case will provide options to enable a transition to zero emission waste vehicles, in line with government commitments. Other associated costs for implementing a city wide FOGO service such as IT support, staffing, education and communication, bin liners and caddy will also be included in the household waste collection business case. These costs will be informed by the current FOGO pilot operating in five Belconnen suburbs.

The renewed household waste collections contract will be delivering services across Canberra as both the total population and housing density increases. Servicing multi-unit developments is a particular challenge for waste trucks and future solutions will need to be more tailored to the range of multi-unit and mixed use developments now and as the city increasingly densifies. There will also be provision in the renewed contract to accommodate food organics collection.

Patterns of waste generation are changing as the city's urban form moves from lower to higher density patterns of living. An increasing percentage of people will be living in dwellings other than detached houses. Most high-rise residential and mixed-use developments, and some medium density residential developments, lack appropriate waste and resource recovery infrastructure and services. This often means all collected waste goes to landfill.

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.

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

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. A separate Cabinet decision will be sought in early 2022 on this issue, following consideration of alternative options including insourcing.

An initial market engagement exercise through an RFI is now advertised as a 'request for information' where information on the initial components of the collection service has been requested from the waste industry. These include 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. Following this, a single-phase open tender process would be the most appropriate method to engage a contractor as there are several providers who would be interested and capable of delivering a high-quality service for the ACT. Current service providers for the separate bulky waste, garden organics and household rubbish and recycling contracts are expected to tender for the consolidated collection services contract.

An initial contract term of 7 - 8 years, to match the lease of the initial waste truck fleet, with an extension option, would likely provide an appropriately long term to attract quality providers and drive value for money. The term will be finalised after the input from the RFI.

Table 1 below provides a summary of the existing funding values to the related contracts for household waste collections. The values are based on the financial year of 2024/25.

Table 1: Current annual contract value

	Current appropriation 2022-23
Current collection service contract to be replaced - recycling and residual	\$13,554,936.00
Current collection service contract to be replaced - garden organics	\$5,474,369.20
Current collection service contract to be replaced - bulky waste	\$4,893,000.00
Current bin supply contract (repairs and maintenance component) to be replaced – mobile garbage bins (MGBs)	\$269,000
Total	\$ 24,191,305.20

Table 2: Preliminary financial impact summary

	2023-24	2024-25
	\$'000	\$'000
Total supplies and services costs under potential new model (Non-indexed)		
Total supplies and services costs under potential new model (Indexed)		

The preliminary cost in Table 2 includes currently appropriated funding and all new additional costs, as outlined below:

- General landfill waste (red bin) collection – reduced from weekly to fortnightly
- FOGO collection – introduced weekly
- Garden waste collection – discontinued and replaced with FOGO
- Recycling collections – continued fortnightly
- Mobile garbage bin supply contract (repairs and maintenance component)
- Bulky waste collection – continued on demand basis (up to once per household per year)
- IT system modifications
- Community education and engagement
- External legal and probity advice for contractor engagement

The preliminary cost at Table 2 includes total cost for collection of green, red and yellow bins and other associated setup costs. The increased costs at Table 2 for the FOGO collections service is largely due to increased collections for the Territory for the weekly FOGO collection, the cost of providing caddy liners for the FOGO service and the anticipated increased cost per lift expected in the new contract. The current contract was negotiated in 2013 and the cost per lift has since increased during that time. This has been factored into the budget with a [REDACTED] contingency for single unit dwellings and a [REDACTED] contingency for multi-unit dwellings recognising the increased complexity in waste collection in higher density urban areas.

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 the business case has been updated following feedback and questions.

1.8 Next steps

The proposed next steps for the project are broken down into eight key phases as shown in the table below. It is key to note that the proposed timeline is very 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.

The household collection service commences under a new contract that sits outside this business case. A summary of the household service contract is at Section 1.6.

Table 9: Project timeline

Stage	Timeframe
Business case finalisation	Q2 2021 – Q4 2021 (9 months)
Procurement process	Q4 2021 – Q4 2022 (13 months)
Procurement finalisation	Q4 2022 – Q1 2023 (2 months)
EIS and Concept Design	Q1 2022– Q3 2023 (18 months)
Development Application	Q2 2023 – Q3 2023 (2 months)
Design (by selected bidder)	Q1 2023 – Q3 2023 (6 months)
Community education	Q3 2023 – Q3 2024 (11 months)
Construction and commissioning (by selected bidder)	Q3 2023 – Q3 2024 (11 months)

The key next phase and deadlines to ensure budget approve are summarised in the table below.

Table 10: Project deadlines

Task	Deadline
Cabinet review process	17 January 2022
Approvals - Budget estimates, including allocation for FOGO procurement	24 March 2022

2. Project Outline

2.1 Description of the Project

2.1.1. Overview

The ACT government is committed to delivering real and lasting improvement in waste management and resource recovery for the ACT. This is in support of the Territory's wider commitments to pursuing prosperity, quality of life and emissions reduction by embracing circular and sustainable waste management.

This Business Case, led by the ACT NoWaste Branch, aims to implement a best practice household waste management process for the ACT. The purpose of this project is to reduce the negative 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 commercial waste, plastic free events could be accommodated, future growth of Canberra, compost quality and contamination rate could be better managed.

Site selection in North Canberra

Site selection study was undertaken through Canberra Town Planning in 2020. The purpose for this study was for the relocation of the Mitchell Resource Management Centre. The potential sites were assessed based on the criteria that the site be minimum size of 6ha and should be located within 20-minute transport radius of the northern catchment. Outputs from this site selection process did not identify a suitable site for relocation of the Mitchell Resource Management Centre.

The ACT sites identified within the above studies have not been reassessed based on more rigorous level for location of a FOGO facility. Given the potential size, location, environmental and planning constraints identified for all options, it was determined that due to land ownership, amenity and planning constraints, the existing Hume precinct is likely to provide the fastest pathway for development of a FOGO facility. A site within the Hume precinct is likely to offer benefits during the EIS assessment process, due to the existing waste activities in the Hume precinct, resulting in minimal expected incremental impacts from the new FOGO processing facility. Additional jobs are expected to be created during the operating phase of the facility in the ACT. Based on analysis of the proposed facility and its operations an additional 10 Full Time Equivalent (FTE) jobs, as well as 1 FTE for the education rollout, are expected to be realised.

Potential alternative sites

During the procurement process, tenderers may opt to take up this option, or offer an alternative site within Canberra or in NSW. If a tenderer provides alternative solution beyond this business case, then a cabinet decision will be required. In the event of any alternative site offers, timing implications (considering the long NSW planning process) and transport emission implications will be considered during the tender evaluation process. Job creation outside of Canberra, risks of feedstock accepted by a facility outside of the ACT, contamination and future population growth of Canberra will also need to be considered.

2.1.3. Scope of works

This proposed investment seeks process food and garden organics service (FOGO) for households, helping to achieve goals set out in the ACT Climate Change and Waste Strategy. Part of the proposed solution, detailed in this Business Case is an in-vessel composting (IVC) facility, that focusses on ACT household feedstock. This investment selection was recommended in the June 2020 Directions paper, backed further by Chris Steel MLA, Minister for Recycling and Waste Reduction in August 2020.

The proposed service is expected to recover 42,000 tpa of FOGO feedstock by 2024, made up of approximately 70% garden organics and 30% food organics. The facility will be sized for at least 50,000 tpa of processing capacity, and no major expansion works to the facility is expected within the first 15 years of operations.

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.

FOGO Pilot

The FOGO Pilot commenced in the Suburbs of Bruce, Cook, Macquarie and Belconnen on the 22nd of November 2021. The service is provided to approximately 5000 households comprising single unit dwellings as well as multi-unit dwellings including apartments and townhouse complexes. The initial weeks of collections have seen limited contamination and increasing participation of households as they become familiar with the service.

The FOGO pilot is supported by a community education and engagement program consisting of one SOG C and one ASO 6 from the NoWaste Waste Education and Partnerships team, to support households and MUDs respectively. A dedicated education officer from the contractor has been employed to undertake bin inspections and follow-up on incidents of contamination in FOGO bins. The initial data from the bin inspections indicates less than 4% households are presenting contamination in the green bins during the initial stages of the pilot. The most common item to contaminate the bins is plastic bags, this is likely due to participants not understanding the need to use compostable bags.

After 6 months of the service a full evaluation will be able to inform the level of participant support for the FOGO pilot, amount of contamination across all households and the level of understanding of the service from households.

2.2 Review 1 (IFCW): Status of Functional Brief/Output Specification

Sign off that the functional brief/output specifications are sufficiently progressed in order to go to market under the delivery model selected and within the procurement timeline outlined in the business case. Attach the Functional Brief at **Appendix A**.

Review 1 (IFCW) Officer Name: _____

Signature: _____

Date: _____

- *This is the first review point for IFCW and is an assessment of the status of the functional brief/output specification.*
- *Sign off should only occur if the IFCW officer is confident that the functional brief/output specifications are sufficiently progressed in order to go to market under the delivery model selected, and within the procurement timeline outlined in the business case.*
- *Risk workshops and quantification of project risks is mandatory for Tier 1 and 2 projects.*

CABINET-IN-CONFIDENCE (after first entry)

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.

3. Needs Analysis

3.1 Problem

Three problems have been identified in response to the need to improve household waste management and resource recovery for the ACT through an Investment Logic Map (ILM) workshop. The workshop was undertaken to better understand the challenges facing the ACT Government in relation to its waste management for household FOGO waste. The ILM was conducted by technical consultants and ACT Government representatives. The following problems were defined:

- Problem 1: Growing volumes of untreated and avoidable organic materials is putting pressure on existing landfill facilities, bringing forward the need for a costly new site in the future
- Problem 2: Growing community concerns around unnecessary disposal of organic materials to landfill and the resulting emissions is a major reputational risk if the Government does not act now
- Problem 3: The inability to turn organic materials into a consumer product is resulting in a wastage of valuable resources and noticeable impacts on the environment and local amenity

It is key to note the impacts of the waste sector on climate change led the discussions and development of the ILM. This in conjunction with a general expectation that the ACT Government can improve its recovery of resources was also a focus for discussion, recognising the value of the organic material that is permanently lost when landfilled. The community expectations are ultimately interdependent with the loss of valuable resources to landfill and any effects of resultant of greenhouse gas emissions.

Discussed in Section 3.1.1, the problems are summarised in the ILM in Figure 1 below.

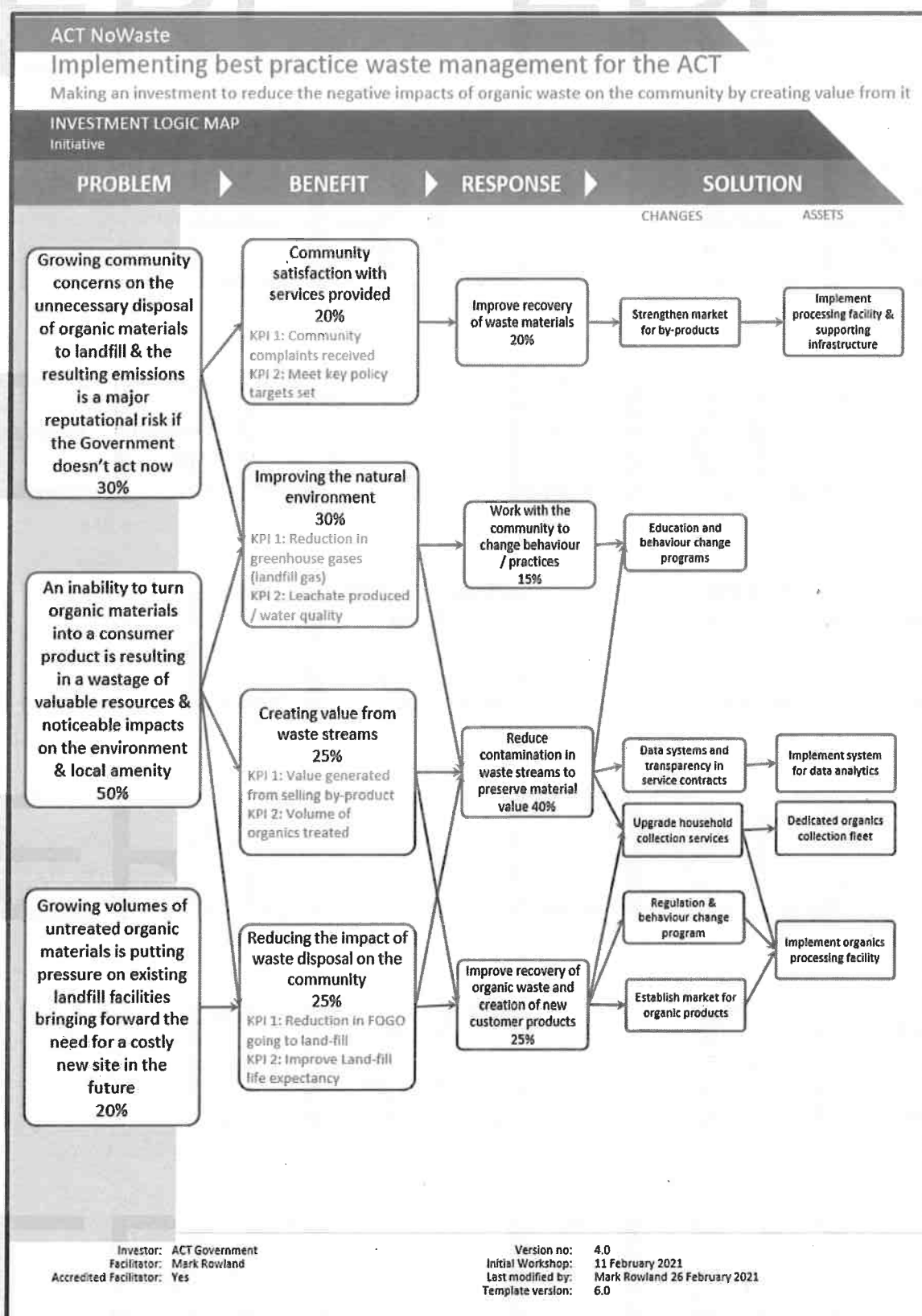


Figure 1: Investment Logic Map

3.1.1. Evidence of the Problem

Problem 1: Growing volumes of untreated and avoidable organic materials is putting pressure on existing landfill facilities, bringing forward the need for a costly new site in the future

Finite landfill capacity and its impacts

Reliance on land filling has a significant impact on landfill capacity, health, and environment. Landfilling is at the bottom of the waste hierarchy, and currently the only option in the ACT organic waste disposal, unless individual household's opt-in to voluntary composting. The Mugga Lane landfill has been expanded to accommodate the growing waste in the state and based on the current rate of waste generation is predicted to reach its capacity limit by 2030.²

Government intervention is required to address these issues, particularly as landfills create air (via methane gas) and water (via leachate) pollution. A key concern is groundwater pollution via leaching. Leachate is the liquid that seeps out of landfill sites made up of a high concentration of chemicals and heavy metals from the combination of industrial and agricultural waste. This has the potential to seep into the groundwater system which can then pollute local water sources and negatively impact water quality and supply. The cost for the government to rectify and manage this issue can be high.³ Implementing the segregation of untreated organic waste can help avoid pressure on existing landfills and has potential to reduce harmful environmental impacts.

Problem 2: Growing community concerns around the unnecessary disposal of organic materials to landfill and the resulting emissions is a major reputational risk if the Government does not act now

Community Awareness / concerns

There is growing community interest in waste and resource management. Rising resource scarcity and tighter environmental standards have shifted consumer and business interest towards the circular economy. As a result, we are witnessing a wide-spread shift in consumer behaviour backed by a mounting desire to recapture our resources and re-use or recirculate them within supply chains. Many countries around the globe have taken measures to reduce their carbon emissions and drive investment into cleaner options, including introducing formal carbon pricing schemes.⁴ Such trends are gaining momentum and shifting community perception and awareness towards climate issues.

A FFW CRC Benchmarking (as yet unpublished) study found that the primary group of food wasters in the ACT were households on higher incomes (of over \$100,000 p.a.) Over 61% of the those interviewed as part of benchmarking study expressed a desire for reducing overall food waste by

² ACT Government, *Waste Feasibility Study Roadmap and Recommendation*, 2018 retrieved from https://s3.ap-southeast-2.amazonaws.com/hdp.au.prod.app.act-yoursay.files/2715/2566/4187/WFS_roadmap.pdf

³ *Environment and Socio-Economic Impacts of Landfills*, 2012 retrieved from https://www.researchgate.net/publication/278738702_Environmental_and_socio-economic_impacts_of_landfills

⁴ Tax Foundation, *Carbon Taxes in Europe*, 2020 retrieved from <https://taxfoundation.org/carbon-taxes-in-europe-2020/>

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

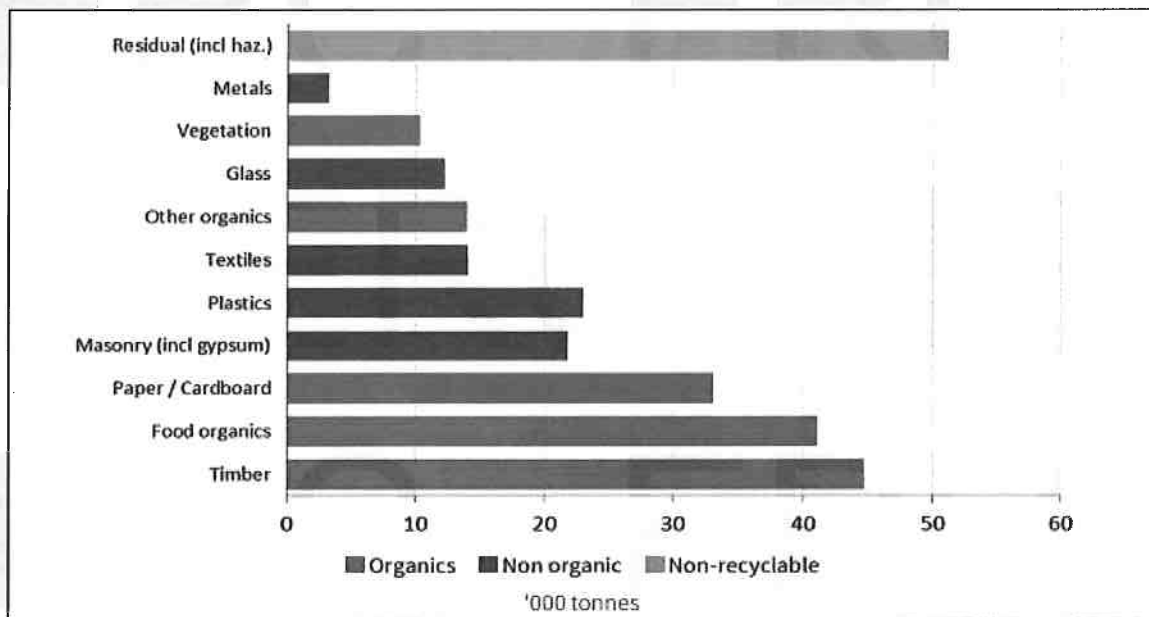


Figure 2: Waste streams going to landfill in 2014-15⁸

The ACT Waste Feasibility study identified the tonnage of various waste streams going to landfill in 2014 – 15, as shown in Figure 2. Over 40,000 tonnes of organic waste were sent to landfill. This identification of waste streams that can be diverted from landfills highlights the clear potential to increase the rate of recovery of organic waste in the ACT.

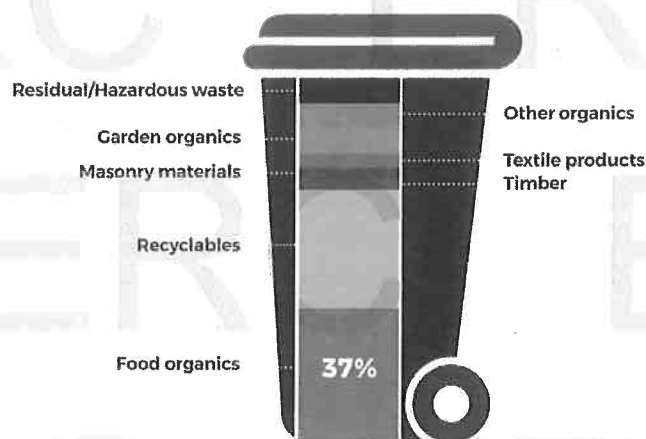
Problem 3: The inability to turn organic materials into a consumer product is resulting in wastage of valuable resources and noticeable impacts on the environment and local amenity

Waste of valuable resources

According to the National Food Waste Baseline report 2019, households are responsible for 34% of waste in the overall food supply chain and 74% of food waste in landfills are from households.⁹ Additionally, kerbside bin audits (Figure 3) found that almost 37% of a typical ACT household 'red bin' is full of food organics. Food and garden organics contain carbon, nutrients, minerals, and water that are recycled naturally as part of the ecosystem. Disposing this to landfill permanently loses the value from these resources.

⁸ ACT Government, *Waste Feasibility Study Roadmap and Recommendations*, 2018 retrieved from https://s3.ap-southeast-2.amazonaws.com/hdp.au.prod.app.act-voursay/files/2715/2566/4187/WFS_roadmap.pdf

⁹ Arcadis, *National Food Waste Baseline*, 2019 retrieved from <https://www.environment.gov.au/system/files/pages/25e36a8c-3a9c-487c-a9cb-66ec15ba61d0/files/national-food-waste-baseline-executive-summary.pdf>

Figure 3: Typical red-bin content¹⁰

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 report¹³ estimating the following figures.

Table 11: 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>

Environmental Impact

Poor waste management has a significant impact on the environment and its amenity for the community. Food organics are highly putrescible due to their high nutrient content and require appropriate management to minimise their impacts on the environment. Every tonne of food waste creates up to 4.5 tons of CO₂ emissions and waste is responsible for approximately 2% of Australia's emissions, consisting largely of methane gas from decay of organic material in landfill.

The *State and Territory Greenhouse Gas Inventories 2018* report provides estimates of total net emissions of greenhouse gas (GHG) in ACT since 1990 as shown in Figure 4 below.¹⁴ The total net emissions include emissions from the energy sector, industrial processes, agriculture, land-use change and forestry and waste. Overall emissions have increased by 21% of 1990 levels as shown in the figure below.

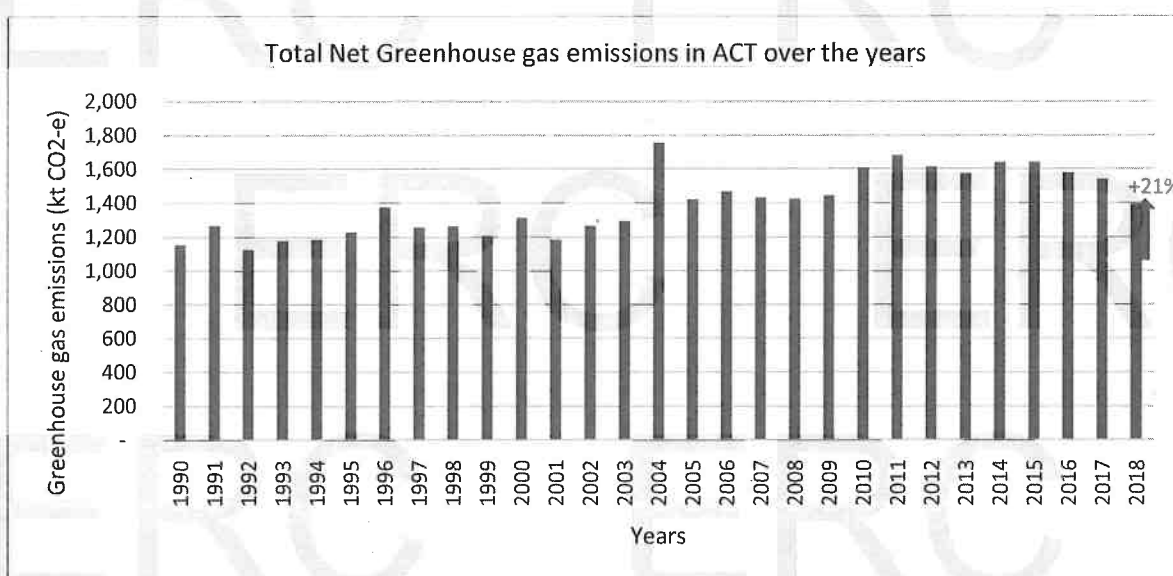


Figure 4: Total Net Greenhouse gas emissions in ACT over the years

The ACT has committed to reducing its overall emissions by (from 1990 levels):

- 40% by 2020
- 50 - 60% by 2025
- 65 - 75% by 2030
- 90 - 95% by 2040
- 100% (net zero emissions) by 2045

¹⁴ *State and territory greenhouse gas inventories emissions time series, 2018*

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.

The community in ACT is highly concerned and mindful of their waste management and household practices as demonstrated by the state survey data by the *Fight Food Waste Cooperative Centre*¹⁵. According to the data, almost 80% of the ACT population is willing to reduce its contribution to food waste in the state and 73% believe it is possible to avoid overall food waste. Furthermore, the ACT has the highest proportion of the community, when compared to any other states, that use a compost bin (via composting groups and volunteers) as a method of waste disposal, suggesting that there is significant potential for relatively high levels of uptake of wider organic waste composting schemes.

Improving community satisfaction with waste disposal practices can help to create a sense of trust in the ACT Government, as it will demonstrate clear actions and initiatives in place to help meet the Territory's aggressive climate change targets.

Benefit 2: Improving the natural environment

As mentioned earlier in this document, organic waste decomposing in landfill produces methane, a highly potent greenhouse gas, as well as leachate. A study conducted by the *United States Environmental Protection Agency* found that diverting 75%-100% of food waste results in significantly lower levels of ammonia in leachate. This means the concentration of organic contaminants from leachate entering the groundwater from landfill is lower. This also has significant potential to reduce the overall leachate treatment costs for the ACT Government – a major operational cost and long-term liability.

Food diversion will significantly reduce overall methane emissions.¹⁶ This has the potential to contribute to a cleaner environment and improve the value of environmental amenities, specifically air quality and human health effects.

A quantitative assessment of the reduction in methane through the use of composting compared to landfilling is included in the Cost Benefit Analysis (CBA).

Benefit 3: Creating value from waste streams

The circular economy is about preserving / maximising the value of resources. Waste can be used in numerous ways by developing circular solutions that lead to local productive reuse. The National Waste Policy action plan states, "For every 10,000 tonnes of waste that is recycled, 9.2 jobs are created, compared with only 2.8 jobs if the same amount goes to landfill. Further, if we increase Australia's resource recovery rate to 80%, an extra 15 million tonnes of material will be recovered every year."¹⁷

There are more than one hundred composting facilities in Australia, and the technology involved is practical, scalable, and robust. Organic waste can be used to turn waste into compost, soil

¹⁵ *Fight Food Waste Cooperative Research Centre* (as yet unpublished)

¹⁶ United States Environmental Protection Agency, *Impact of Food Waste Diversion on Landfill Emissions*, 2020 retrieved from https://cfpub.epa.gov/si/si_public_record_report.cfm?Lab=CESER&dirEntryId=348317

¹⁷ Australian Government, *National Waste Policy Action Plan*, 2019

amendments or natural fertilisers, in turn creating revenue opportunities. These opportunities are higher 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.

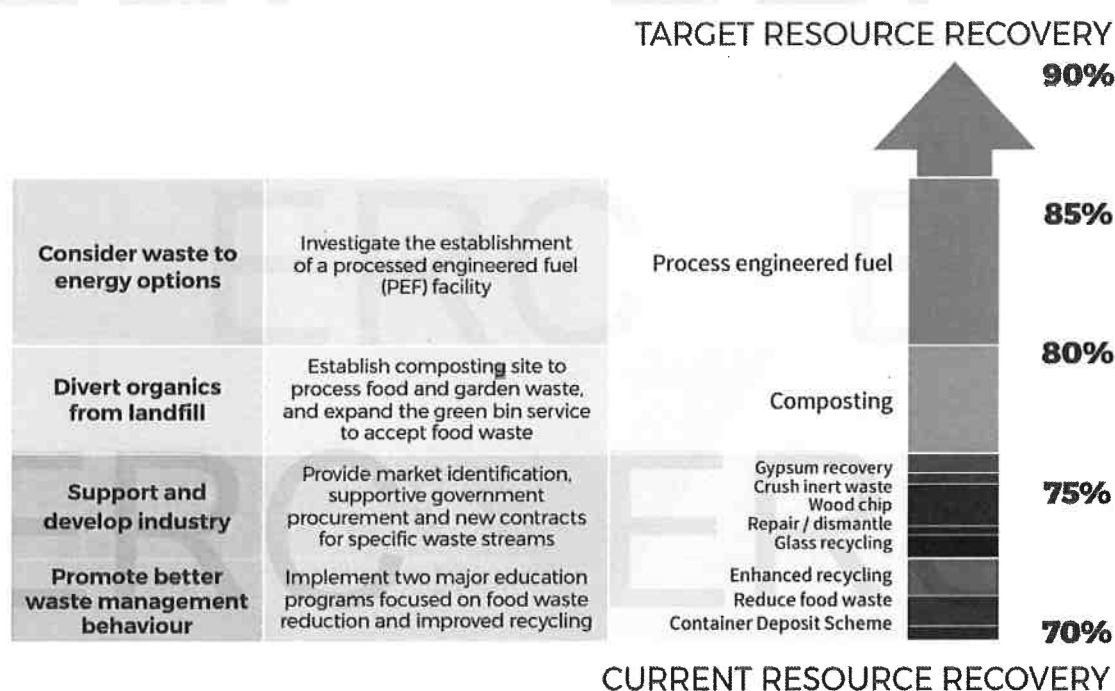


Figure 6: Snapshot of the roadmap initiatives towards 90% resource recovery

Benefit 4: Reducing the impact of waste disposal on the community

A research study has quantified the reduction of greenhouse gases from landfill waste streams in New South Wales, and found that 'removing organic food waste from the landfill stream could reduce GHG emissions compared with landfilling the food waste by about 0.805 tCO₂e/year' for each tonne of waste.¹⁸

In addition to the reduction of greenhouse gas emissions from landfill, it also supports the reduction of the impacts on the quality of surface and groundwater, foul odour and several carriers of diseases at landfill sites. Consequently, this results in reduced existing waste management costs, reduced human exposure to untreated waste, capacity development of local farmers by enhanced soil productivity, and significant job creation with the development and ongoing operation of a dedicated composting facility.

Benefit Realisation

The benefits realisation table below outlines the key benefits, responses and KPIs. This was defined as part of the ILM.

¹⁸ Hoda Karimipour, Vivian W. Y. Tam, Helen Burnie & Khoa N. Le *Quantifying the effects of general waste reduction on greenhouse-gas emissions at public facilities*, (2019) Journal of the Air & Waste Management Association, 69:10, 1247-1257, DOI: 10.1080/10962247.2019.1642967

Table 12: 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

improve household and business waste reduction, along with further education provided to the community.

The project is aligned with key drivers of change within the ACT Government. It also aligns with UN Sustainable Development Goal 12, which is Responsible Consumption and Production that includes a specific target to reduce food waste by 50% by 2030. Additionally, the proposed project would be consistent with global best practice, such as the EU Circular Economy Directive which supports source separation, particularly organics.

The project alignment with key policy, planning documents and political commitments is outlined below in Table 3.

Table 13: 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	
ACT Waste Management Strategy 2011 – 2025, Environment and Sustainable Development, ACT Government	The goal of the ACT is to achieve full resource recovery and a carbon neutral waste sector. Outcome 2 and 4 states <i>Full Resource Recovery</i> and <i>Carbon Neutral Waste Sector</i> respectively with targets that align with this project and is listed below:		
	Outcome 2 Targets:	Outcome 4 Targets:	
	The rate of resource recovery increases over 80% by 2015. – over 85% by 2020. – over 90% by 2025.	The ACT Waste Sector is carbon neutral by 2020 – energy generated from waste doubling by 2020. – waste resources are recovered for carbon sequestration by 2020.	
	Strategies	Strategies	
	2.2 Recover organic and residual waste resources. 2.3 Develop markets for organic and residual waste resources. 2.10 Disincentives to landfill including appropriate pricing and regulation.	4.2 Minimise organic waste to landfill 4.3 Expand bioenergy generation and investigate new energy from-waste technologies to generate energy. 4.4 Increase recycling to avoid greenhouse gas emissions. 4.5 Ensure energy efficient waste collection and transport solutions.	
Love Food Hate Waste, ACT Government Program	Love Food Hate Waste is a pilot program led by ACT NoWaste that aims to raise awareness about food waste and encourage residents to find ways to avoid and reduce it. This program is a part of ACT’s response to help achieve goals expressed in the National Food Waste Strategy (to halve the food waste by 2030), ACT Waste Feasibility Study (minimise waste to landfill and reuse valuable resources) and ACT Climate Change Strategy 2019 (to achieve net zero emissions by 2045). The		

Policy	Alignment with project and ability to enhance current ACT Policy or deliver new ones
Australia's Climate Change Strategy, Department of Industry, Science, Energy and Resources	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. 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
National Waste Policy, Department of Agriculture, Water and Environment The 2018 National Waste Policy was prepared collaboratively by the Australian Government, state and territory governments and the Australian Local Government Association. It provides a framework for collective action by businesses, governments, communities and individuals until 2030. The principles and strategies that align with this project are: Principle 2: Improve Resource Recovery <i>Improve material collection systems and processes for recycling.</i> A FOGO processing facility is a form of improved recycling, generating compost and aligning with this principle.	• Supporting technology adoption • Encouraging collaboration Priority 3 – Market Development Outcome - Development of markets to support the repurposing of food waste. This focuses on: • Identifying food waste composition and nutritional value to develop new markets • Encourage innovation • Connecting food waste sources to users Improving existing processes is a crucial part of avoiding food waste and supporting innovative technology to create value from waste (waste recovery) is a way to support the priorities of this strategy. Technology adoption such as composting facilities encourage collaboration by linking kerbside separation, local composting facilities, development of new markets to support waste recovery (compost from waste). These all align and contribute to the priority areas in the National Food Waste Strategy.

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. • <i>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</i> 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 <i>Agreement between Labor party and Greens, represents the parties' shared commitment to serve people of ACT</i>	
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
address the land use conflict issues between essential industrial land uses including waste infrastructure and sensitive land uses such as residential development. Legislative, Executive and Administrative reform - Create circular economy legislation to, amongst other things, phase out single use plastics Phase out of single-use plastics acknowledged in the SWIP, but no major flow-on infrastructure impacts as this is a low-tonnage stream. The <i>Plastic Reduction Act 2021</i> (the Act) came into effect on 1 July 2021 and banned the sale, supply and distribution of single-use plastic drink stirrers, cutlery and expanded polystyrene containers for serving food or a beverage. The Act allows the Minister to declare both government and non-governments events to be a declared public event and declare that single-use plastic products, in addition to products already banned under the Act must not be supplied at the event. Contamination of waste in previous years has been a barrier to recycling waste from events. The new legislation and declarations to ban plastic items will help to reduce plastic contamination. ACT NoWaste will assist event organisers to reduce plastic waste over time as plastic items are either avoided or substituted for non-plastic alternatives. This will likely result in less plastic contamination in organic waste over time and create a waste stream that may be suitable for composting.	
Greens policy platform - Improve household and business waste reduction and recycling education (\$2M over 4 years)	The importance of education for behaviour change is emphasised in the SWIP, particularly in relation to FOGO introduction. No specific budget is proposed in the SWIP.
Greens policy platform - Deliver an organic waste processing facility for households and businesses	FOGO processing using in-vessel composting at a preferred site in HRRE is a key infrastructure commitment which is included in the SWIP.

Policy	
Greens policy platform - Set targets in ACT Government procurement for zero waste consumption and minimum amounts of recycled content	Alignment with project and ability to enhance current ACT Policy or deliver new ones
	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.

3.4 Options Analysis

3.4.1. Strategic Solutions Analysis

The ACT Government has investigated a wide number of options in improving waste management in preparation of this business case. Strategic directions were set out in the 2018 Waste Feasibility Study – Roadmap and Recommendations to divert organics from landfill. These options were:

- Strategic Option 1: Establishing a comprehensive Foods Waste reduction and recovery program
- Strategic Option 2: Ongoing participation and support to the national food waste initiatives
- Strategic Option 3: Implementation of kerbside FOGO collection service which is aligned with the existing GO bin rollout program
- Strategic Option 4: Establishing a composting facility within the ACT that is capable of processing both food and garden organics

Strategic Option 1: Establishing a comprehensive Foods Waste reduction and recovery program

This strategic option is for a food waste reduction and recovery program that is underpinned by the waste hierarchy's primary principle of avoiding and reducing waste generation.

This initial food waste reduction and recovery program could be modelled closely on the highly successful Love Food Hate Waste program from the UK. Love Food Hate Waste helps households and businesses avoid food waste, save time and money, and reduce their environmental impact by planning better, shopping smarter and storing food effectively. The program features tips on buying, cooking and storing food to avoid or reduce food waste.

Results from the UK indicate reductions in food waste of 15% to 20%. The financial savings, over various jurisdictions, range from \$16 to \$250 due to reduction of food waste for every dollar invested in the program.

Similar programs have been successfully implemented by NSW and Victoria. In NSW, the Love Food Hate Waste program is managed by the Environment Protection Agency and runs in partnership with retailers, food manufacturers, local government authorities and community or charity groups.

To be successful, these types of programmes as demonstrated in NSW and as the proposed approach for the ACT, require a collaborative approach across governments and related agencies, not-for-profit-organisations, local industry, and small to medium businesses to drive and champion the initiative and ultimately implement. This enables the benefits for the various food rescue charities to be realised and which in turn supports reduction of food waste.

Additionally, supporting the primary principle of waste avoidance and reduction would include any future work looking to reduce retail and food packaging.

A Love Food Hate Waste Program has already been introduced in the ACT, which includes inspiring ideas, recipes, facts and resources for the community. The program ceased 30 June 2021.

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.

3.4.2. Recommended Strategic Solution

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

The recommended strategic solution focuses on household organics, as this represents the largest proportion of organic waste. Focusing on household organics was deemed to have the greatest impact to the problems and help achieve goals set out in the ACT Waste Management Strategy, the 2018 Roadmap and the ACT Climate Change Strategy.

At present, the ACT Government has control only over the management and collection of household waste. Whereas commercial and industrial waste is handled by private entities. A wider review of commercial and household waste is being prepared by the government. By implementing a separation of food and organic waste process and composting, household waste alone can significantly increase resource recovery and reduce the need for landfills including the burden they pose on communities.

3.4.3. Project Solutions Analysis

To establish a composting facility that is capable of processing both food and garden organics, a project solutions analysis has been undertaken that is outcomes focused. This creates a clear link between the solution and the risks and benefits for the ACT, rather than adopting a technology-focused assessment. This meant that value for money into consideration is considered at an early stage.

The assessment of high-level scenarios was based on the following understanding of ACT's risk appetite and key objectives to enable FOGO implementation:

- Achieving policy objectives and targets for resource recovery.
- Supporting and aligning to Climate Policy and greenhouse gas (GHG) reduction targets.
- Futureproofing to provide resilience against market shocks and flexibility to take advantage of future opportunities.
- Maintaining public trust in the resource recovery system as a whole, and in the ACT government role in guiding and procuring this.
- Access and equity in ACT waste services.
- Generating viable, marketable products.

The ACT's attitudes to risk, investment and waste operations are understood to capture the following. This was used as a framework for our project solutions assessment.

- ACT values the provision of resource recovery as an essential public service and supports this through mechanisms such as low-cost leasing of land and direct payments to private resource recovery operators to offer free material drop-off in the ACT.
- ACT is willing to show leadership in investment for social and environmental outcomes, for example under emissions abatement commitments.

- 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 14 below, with details of all case studies used included in Appendix F.

Table 14: Benchmarking study

Case Study	Population	FOGO Program	Tonnes of FOGO	Processing Technology	Contamination	Compost outlets and experience
Bunbury-Harvey Regional Council WA	~46,000 people across 7 local government areas	- First 2 Councils: 2013 - Complete rollout: 2019	18,000 in 2019. Facility is experiencing some operational pressures as it approaches its 20,000tpa licence limit.	Open windrow processing with a mobile aerated floor system, and periodic turning of the piles to achieve uniform composting.	- Average contamination rate is 2.4% - Councils are obliged to pay a penalty if > 5% contamination - Manual decontamination	<10mm fraction is the sold as organic compost "360 Organics" recently launched, sold into the following markets: - Horticulture, market gardens and orchards. Avocado farmers and orchards in the South-West region are important customers. - Viticulture, particularly vineyards pursuing organic certification - Sale to the public through transfer stations and landscaping suppliers - Transport Canberra - Roads verge rehabilitation
Tweed Shire Council, NSW	~60,000 people in single unit dwelling Multi-unit dwellings can opt-in	1 July 2017	12,258 tonnes in 2018/19	Predominantly open windrow composting In-vessel composting facility commissioned in 2019, to increase the quantities of commercial liquid waste and food waste	4% contamination rate in 2018	No visibility on the compost output

Table 15 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 15: 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
Insect processing	Not preferred	Does not align strongly to the direction of regulatory standards and organics processing approaches for metropolitan centres. Insect farming is an established technology but is high cost, labour intensive, and unsuitable for processing the woody garden waste fraction of FOGO waste. Goterra is an ACT-based business which processes food waste into protein meal using black soldier fly larvae. Goterra currently accept food waste from Palerang council. This is a significantly smaller quantity of waste than the expected FOGO recovery from across ACT. Insect processing is not identified as the preferred technology for the feasibility study and business case due to lack of proven reference projects. However, the tender process will be sufficiently flexible to allow Companies to submit competitive bids if they feel their technology can meet ACT NoWaste requirements.
Co-located dry AD and IVC	Not preferred	Co-location of dry AD to recover energy from FOGO organics and FOGO IVC infrastructure repurposed for digestate stabilisation is possible future configuration which could potentially be pursued in response to significant increases in the value of renewable biogas.
Co-located wet AD and IVC infrastructure.	Not preferred	Wet AD is not a suitable technology for processing FOGO feedstock. It requires feedstocks such as commercial food waste, liquid waste and sewage sludge which are not controlled or easily attracted by ACT. This technology does not address the core objective of diverting FOGO organics from landfill. Additionally, wet AD technology for feedstock such as commercial food waste is unlikely to be developed in ACT until a premium value for renewable energy from biogas is established. Wet AD produces a solid digestate which requires outlets for recovery. Incorporation into an IVC process is one potential pathway for this material.

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.

Scenario	Status	Rationale
		Reliance on additional organic waste streams would only be appropriate where a local processing operation is not available and transport of waste to ACT is more cost-effective than developing local processing capacity. Consolidation of waste to the ACT has transport implications, and associated costs and emissions which would need to be considered. If ACT were to take a role as a regional processing hub, clear responsibilities and performance standards would need to be established with regard to contamination. This would add complexity to the project but could be considered where regional leadership from the ACT provides wider resource recovery benefits, while increasing the scale and decreasing the unit cost of organics processing.
Design of AD or IVC to accept agricultural feedstocks	Not preferred	The ACT does not require additional feedstock to achieve a viable and efficient scale of processing for FOGO organics. In agricultural contexts, organic waste materials are typically recovered through reapplication to agricultural land. They are not a focus for meeting landfill diversion and emissions reduction objectives. Some agricultural feedstocks are not well-suited for co-processing with FOGO material, and reliance on these streams increases the complexity and risk of the FOGO processing project, without clearly contributing to ACT core objectives. Co-processing of FOGO organics and agricultural organics has significant transport implications, and associated costs and emissions. Local solutions for challenging agricultural wastes, for example wet anaerobic digestion of liquid waste from intensive livestock, abattoirs and food processing operations is more likely to be appropriate for challenging agricultural wastes. The ACT may have a role in facilitating these types of projects but does not have a clear role to procure or directly support them.

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 waste, 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.

It is expected that around 42,000tpa of FOGO feedstock could be recovered from 2024, made up of approximately 70% garden organics and 30% food organics. It is recommended that the facility be sized with at least 50,000tpa of processing capacity available from 2024, and no major expansion works expected to the facility within the first 15 years of operations. If disposed to landfill, this material would generate methane emissions equivalent to around 73,000 tonnes of CO_{2-e}¹⁹, which can only partially be captured by landfill gas collection. This preferred option was identified in the Direction paper in June 2020 and confirmed in August 2020. The tonnages have been refined through more detailed data analysis in this feasibility study, but this does not affect the validity of high-level conclusions reached at the Directions paper stage.

It is expected that around 42,000tpa of FOGO feedstock could be recovered from 2024 from ACT, whereas the EIS for the FOGO facility will be approved for 70,000tpa capacity. Growth in the baseline projection over the term of the first operating contract is around 5,000tpa. Spare capacity could be used to accept commercial food waste on a shorter contract term. It is desirable for this to be allowed within the contract. Tenderers who are confident in their ability to secure commercial tonnages may view this as a lever to reduce the likelihood and duration of facility underutilisation and may be able to offer a better price for processing ACT FOGO material accordingly.

2015 Landfill and Transfer Station Waste Audits shows approx. 8.7% of commercial and industrial waste generated from commercial waste is food waste. There was a total of 83,735.7 tonnes of Commercial and industrial waste to the Mugga Lane landfill in 2020-21. Using 2015 audit percentage, 7300 tonnes of food waste was generated by commercial stream which included food waste from shopping centres, cafes, restaurants, mixed small businesses.

The additional capacity of a 70,000 tpa FOGO facility will provide opportunity for commercial feedstocks and feedstock from regional Canberra to be considered in the future, noting work currently underway investigating options to require businesses to have a separate collection for organic waste from 2023 as part of the *ACT Parliamentary and Governing Agreement (PaGA) of the 10th Assembly*.

ACT NoWaste is also considering legislative options additional to the requirements stipulated in the PaGA commitment that may be included in the circular economy legislation. One legislative option being considered is to ban food waste from landfill. This ban could be a potential next step to reducing or eliminating food waste in landfill once the household FOGO collection service has been established and businesses are required to have a separate organics collection service.

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.

¹⁹ <https://www.industry.gov.au/sites/default/files/2020-10/national-greenhouse-accounts-factors-2020.pdf>

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 16: 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.

CABINET-IN-CONFIDENCE (after first entry)

	Components	Capex/opex	Comments
	• Process control systems / SCADA • Fans		
Mobile plant and equipment	• Loaders • Material handlers • Turning equipment if used • Shredding and screening equipment	Initial equipment: capex Maintenance and operational adjustments: Opex	Mobile plant and equipment more flexible to operational changes over time
Labour	• Plant operation • Maintenance • Site management • Admin • Cleaning • Laboratory Technician • Sales	Opex	Staff loading may be able to be reduced if another facility or operation is sharing resources. i.e., Management / Sales / Laboratory
Land		Factored into capex or lease cost as Opex	ACT owned land offered no leasing or acquisition costs assumed for costing purposes.



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

3.5 Review 2 (Treasury): Needs Analysis

Treasury directorate to sign off that a case for the project is present in the business case.

Review 2 (Treasury) Officer Name: _____

Signature: _____

Date: _____

- *This is the first review point for Treasury and is assessment of the need's analysis.*
- *Sign off should only occur if the Treasury officer is confident that the needs analysis is robust, is based on evidence and an Investment Logic Workshop (ILW) has been undertaken (if applicable).*
- *Note that Tier 1 business cases anticipate review and signoff by the Under Treasurer.*

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.*

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

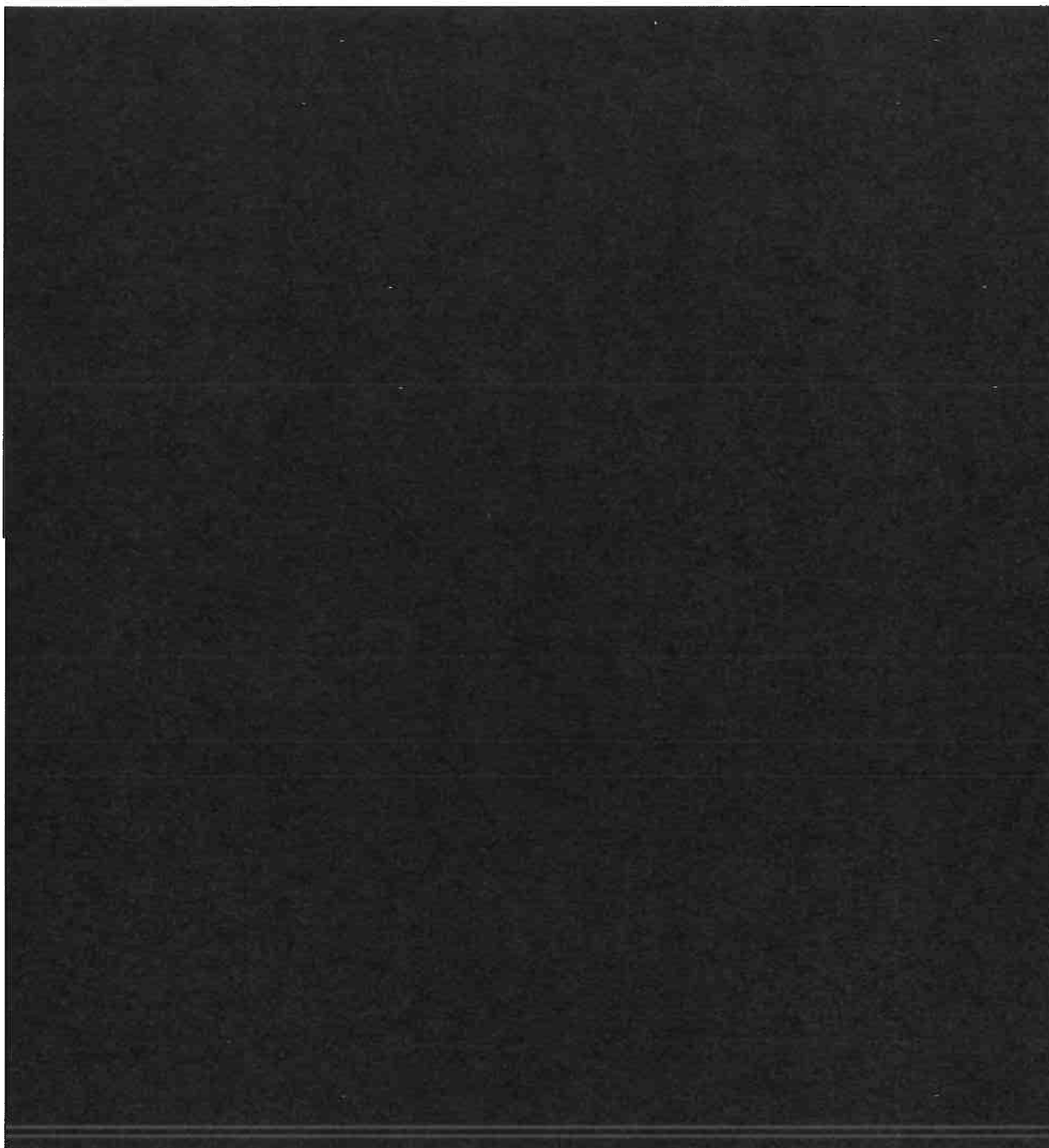
The capital and operating costs for the FOGO Facility have been estimated using a benchmarking analysis of the following:

- 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.



As shown in Figure 9 and Figure 10, Company A, B and C refers to the three tenders received for a project in NSW to deliver a composting facility. Each tenderer used In Vessel Composting technology with forced airflow and covered maturation with odour treatment. Therefore, from a high level, the tenders are comparable to some extent. However, the costs between companies vary due to the following reasons:

- Quality of process – Each tender had slightly different processing parameters, particularly the tunnel residence time. A shorter tunnel residence time means a high volume of

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 17.

Table 17: Summary capital costs

Item	Value (\$ FY21, real)
Development capital costs	
Project support costs	
Construction capital costs	
External utilities connection	
Recycling road extension	
Contractor profit margin	
Total capital costs	

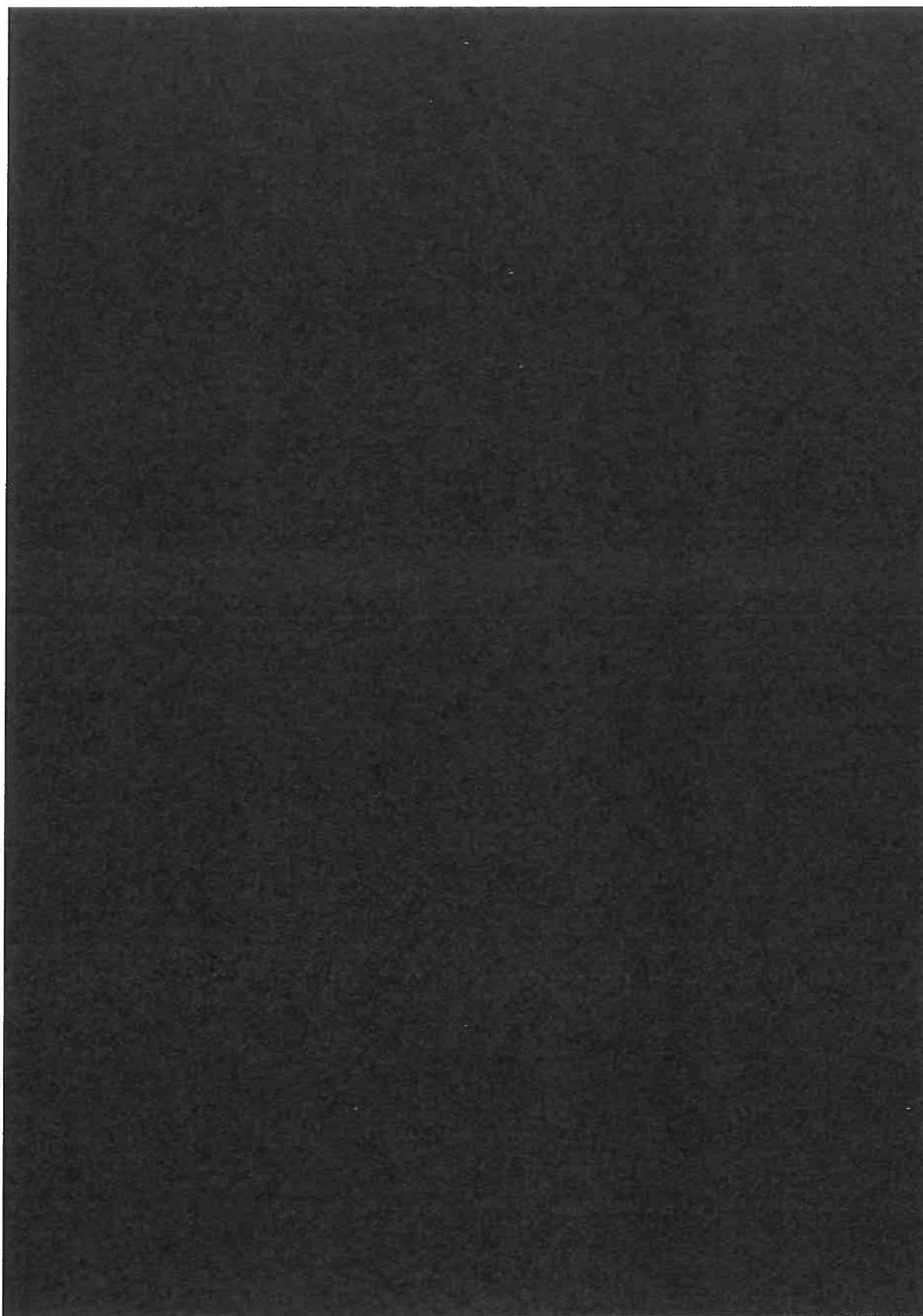
The capital costs for the project consist of several elements that will be required for delivery. The table below sets out each of these parameters alongside a broad description as to how they were devised.

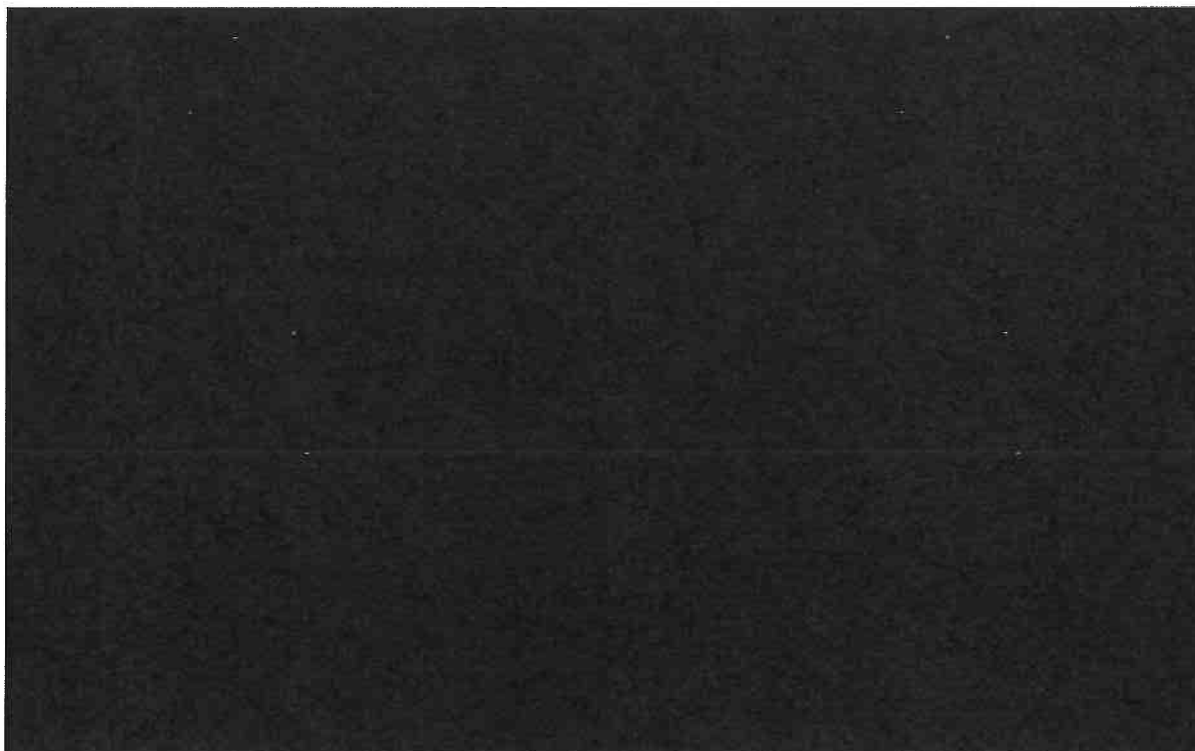
The capital costs outlined are preliminary and are reflective of the current stage of development of the project, feasibility stage. Through further project development, costs will be refined. This will primarily be achieved by receiving contractor tender returns with fixed pricing for the project and by receiving quotations for other primary elements such as the utilities connections.

Table 18: Detailed assumptions for capital costs

This image appears to be a scan of a dark surface or a blank page from a microfilm reel. It shows significant vertical banding and some small white specks, likely due to the scanning process or the original medium's condition. There is no legible text or identifiable figures present.

CABINET-IN-CONFIDENCE (after first entry)





4.2.2. Operational Costs

The estimated operational costs (excluding risk adjustment) across 20-year operational period for the project is summarised in Table 19 and Table 20 .

Table 19: Total operational costs across 20 years

Item	Value (\$ FY21, real)
Staff costs	
Education costs	
Fixed costs	
Variable O&M costs	
Landfill costs	
Contractor profit margin	
Total operational costs	

Table 20: Annual cost for first full year of operation

Item	Value (\$ FY21, real)
Staff costs	
Education costs	
Fixed costs	
Variable O&M costs	
Landfill costs	
Contractor profit margin	
Total operational costs	

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

Delivery Model	Score: Cost and Level of Complexity for Government	Justification
		no certainty for variation or long-term costs.
Design & Construct	3	Provides only short-term construction price certainty in accordance with agreed terms, but no certainty for variation or long-term costs.
Design Construct Maintain (Short Term)	3	Provides only short-term construction and maintenance price certainty in accordance with agreed terms, but no certainty for variation or long-term costs.
Design Construct Maintain (Long Term)	4	Provides short-term construction and maintenance price certainty in accordance with agreed terms, but no certainty for variation or long-term operational costs.
Design Construct Maintain Operate	4	Fee agreed for all short-term and long-term costs relating to the facility, with only variability arising in respect of risks retained by ACT in the risk allocation and contract.
User Charge PPP	5	Fee generally covers most costs relating to the facility. Long term contractual certainty over costs throughout the project's lifecycle, and minimised upfront outlay for ACT. Risks retained by ACT in the risk allocation and PPP contract can result in variability if mitigants are not properly identified.

Outcomes of MCA

The results the MCA identified a **DCMO** and a **User Charge PPP** as preferred delivery models.

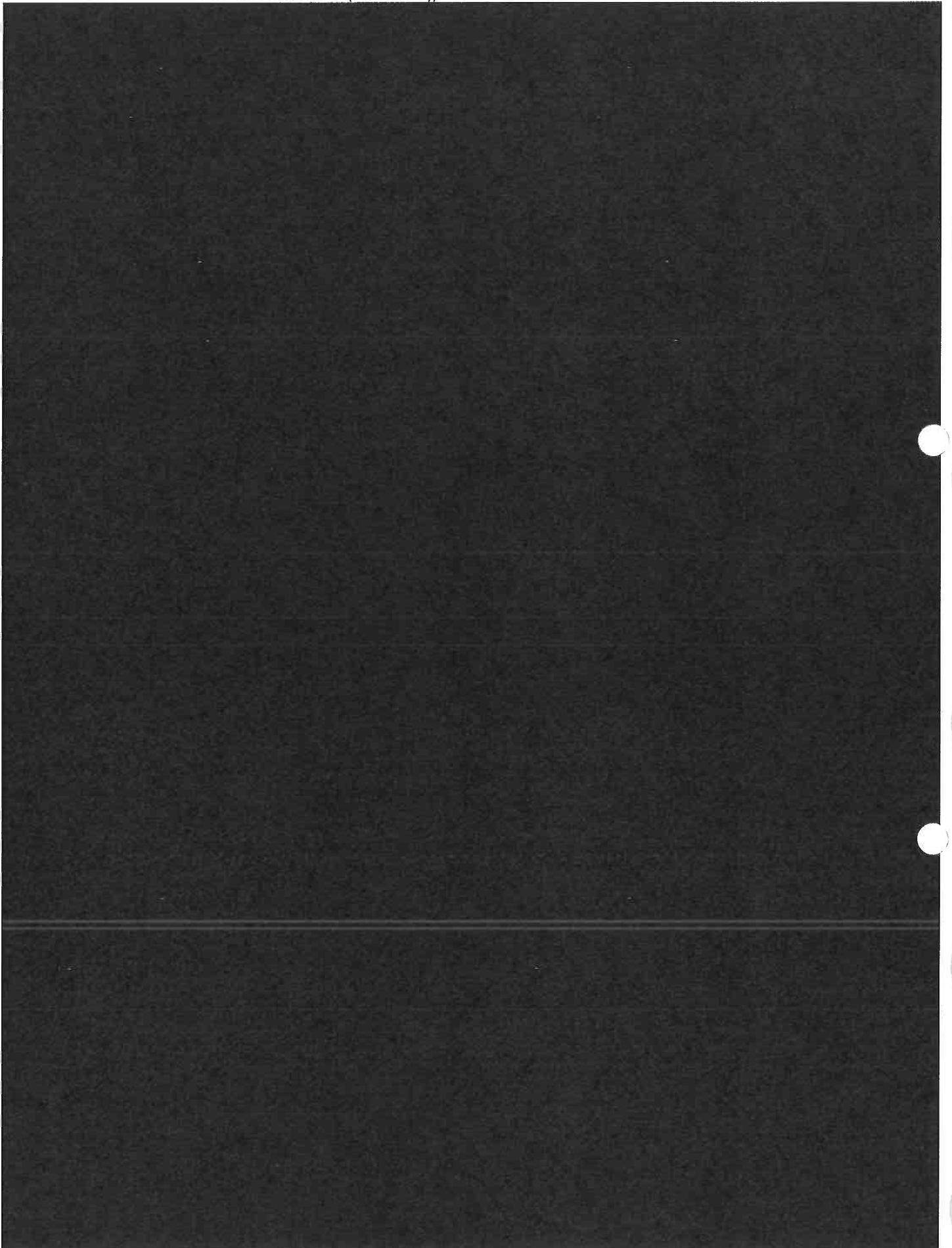
Table 63: Summary of MCA Analysis

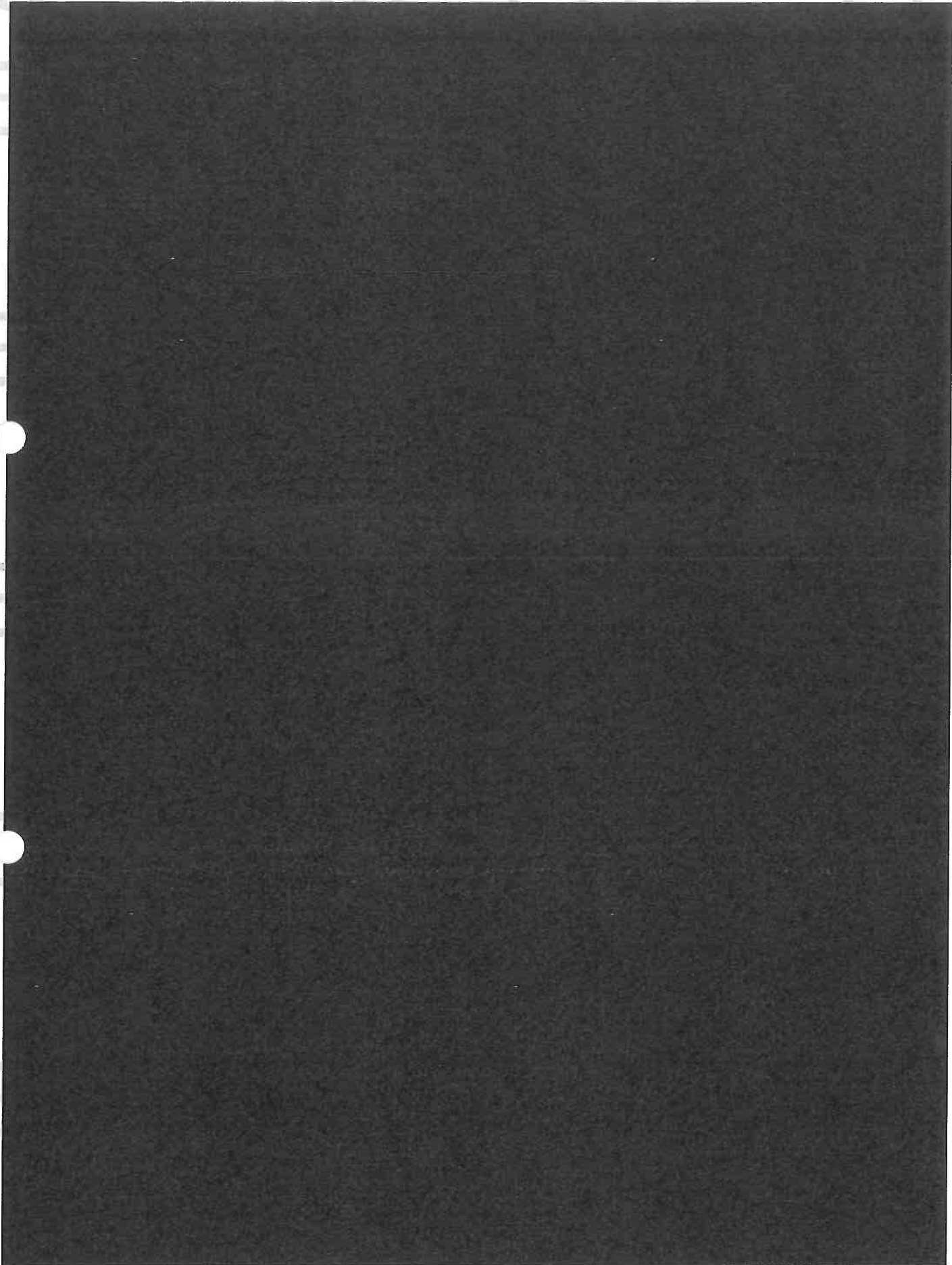
MCA Criteria	MCA Weighting	Document & Construct	Design & Construct	Design Construct Maintain (Short Term)	Design Construct Maintain (Long Term)	Design Construct Maintain Operate	User Charge PPP
Time to deliver	16%	4.0	4.0	3.0	3.0	2.5	2.0
Flexibility	11%	4.0	3.0	2.0	2.0	2.0	1.0
Level of Integration / 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

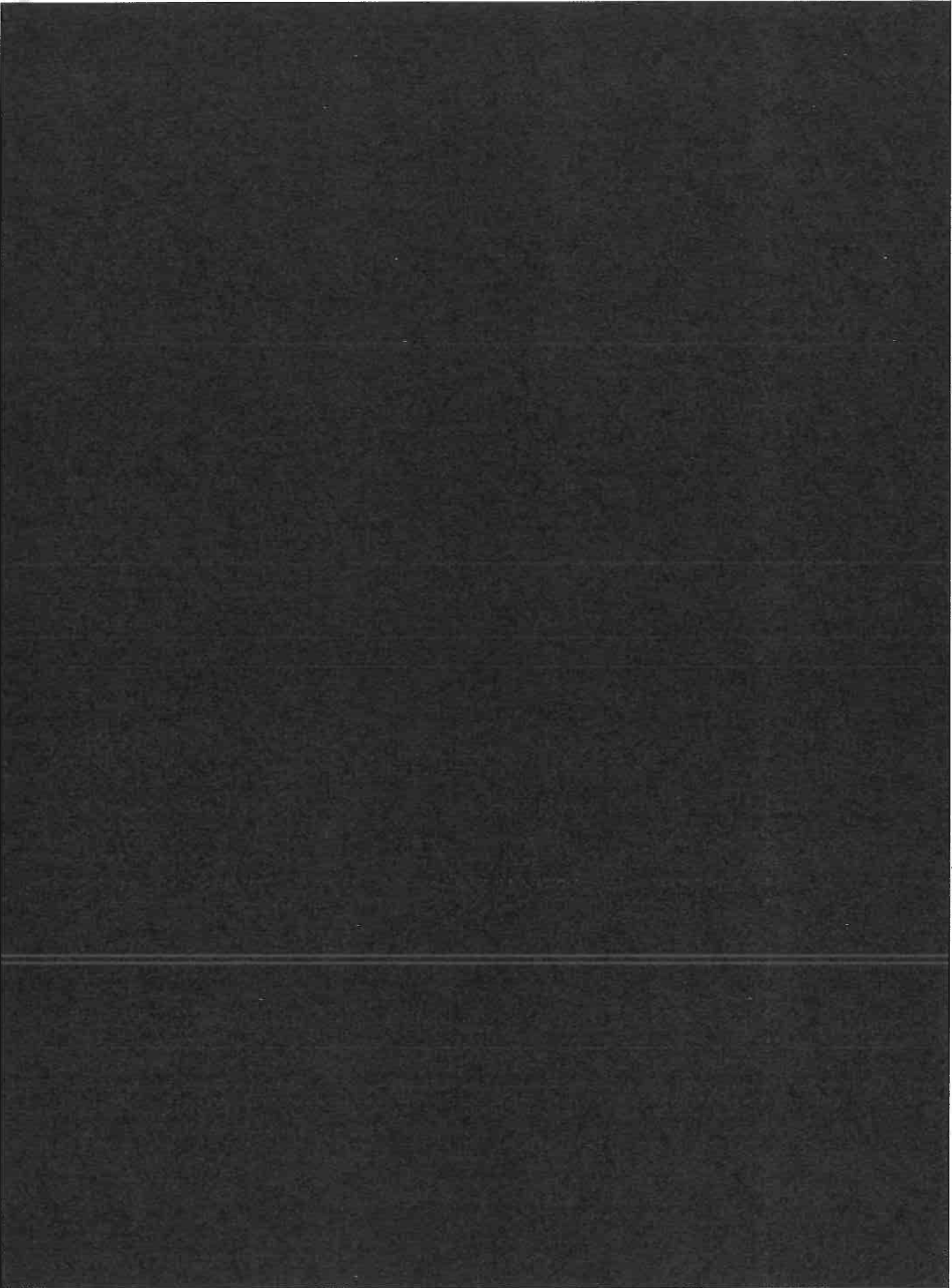
12.11 Appendix K – Delivery Model Market Sounding Report

Important Note

This report is a confidential document that has been prepared by Arup and Sphere at the request of the ACT NoWaste in accordance with the terms of our engagement with ACT NoWaste in relation to a market engagement process for the FOGO Facility Procurement delivery model assessment. The report reflects a summary of the opinions expressed by the participants in the market engagement process. No verification of these views or any supplementary information provided by participants has been carried out by Arup, Sphere, or any of our respective agents, directors, officers, contractors or employees. Arup, Sphere, and our respective agents, directors, officers, contractors and employees make no express or implied representation or warranty as to the accuracy, reliability or completeness of the views expressed or supplementary information provided. This report does not purport to contain all the information that ACT NoWaste may require in considering the FOGO Facility Procurement. This report is for the sole use of ACT NoWaste in considering the FOGO Facility Procurement. The information contained in this report is strictly confidential and must not be copied, reproduced, distributed, disseminated or used, in whole or in part, for any purpose other than as detailed above without Arup's express written permission.







WELLBEING IMPACT ASSESSMENT

The 10th Legislative Assembly Parliamentary and Governing Agreement outlines the Government's commitment to ensuring government budgets, decision-making and reporting, including consistent, meaningful and measurable strategic and accountability indicators are based on wellbeing.

Wellbeing is about the quality of life of all Canberrans. So, over and above the general impacts of proposals, you should fully consider the impacts on the lives of priority target groups including: Aboriginal and Torres Strait Islander Peoples; Carers; Children and Young people; Culturally and Linguistically diverse people; LGBTIQ+; Older Canberrans; People with a disability and Women.

How to use this assessment tool

In general, a proposal is expected to identify no more than two key impacts. Please describe the most significant impact as Impact 1, and less significant impact(s) as Impact 2 etc. For complex proposals where more than two key impacts are identified, please extend the template by copying the table onto an additional sheet. Wellbeing impacts may be aligned with the 56 wellbeing indicators in the wellbeing dashboard, but close alignment with the dashboard is not required. This reflects that the dashboard is not intended to cover every aspect of our policies, programs, and services - and so domains should be considered holistically.

Keep your responses in the table succinct. The table should summarise, as necessary, information that has already been described in greater detail in the business case documents accompanying this proposal.

1. Impact(s) description

Requirement: Identify the wellbeing impact(s) of this proposal.

A wellbeing impact identifies how this proposal would contribute to the wellbeing of Canberrans affected by it (noting there could be positive or negative wellbeing impacts). A proposal can have different wellbeing impacts at different stages of its delivery. It may be helpful to think about the wellbeing impact on Canberrans during transition/construction phases, as well as when a proposal is fully operational.

It is important to recognise that a proposal can carry multiple wellbeing impacts (including beyond your work area or agency, which are important to capture).

2. Who is affected?

Requirement: Describe the Canberrans whose wellbeing will be impacted by this proposal.

You may describe more than one key group of Canberrans in a single table, if multiple groups are affected by the same wellbeing impact.

Be specific according to the proposal: Does the proposal target an age group? Residents of a neighbourhood? A group within the community? Individuals in need of a particular service?

Who will use the capital asset? Who lives or works near the capital asset?

Estimate the number of Canberrans in each group who would be impacted by the proposal. The same group may be affected by multiple wellbeing impacts.

3. Direction and type of impact

Requirement: Identify the direction and type of the wellbeing impact(s).

A well-considered assessment will account for any possible negative wellbeing effects on individuals or groups, alongside the desirable positive effects.

A wellbeing impact may be **major** (a direct, sustained impact) or **minor** (either a direct, sporadic impact or an indirect, sustained impact).

An anticipated wellbeing impact should be considered in relation to the status quo.

Groups who may sustain negative wellbeing impacts should be described in the same way as groups whose wellbeing may be positively affected (i.e., identity of group, estimated size of group, nature of specific impacts). If multiple groups have been described and these groups will experience different magnitudes of effect, please indicate the anticipated effect for each group.

4. Timeframe

Requirement: Estimate the timeframe for the wellbeing impact(s) to be realised.

The suggested timeframes are: within one year, between one and five years, five years plus (or otherwise as determined by the maturity of the proposal).

You may wish to estimate timeframes consistent with stages of projects (as appropriate) such as during a feasibility study or differing phases of a project, or when close to completion and the potential impacts on wellbeing during these stages.

A proposal may include impacts with different timeframes; the possibility of longer-term impacts should also be considered even if they are difficult to estimate.

5. Evidence base/quality

Requirement: Describe the data and other evidence base that supports the identification of this proposal's impact(s) and the anticipated effect that these impact(s) will have on wellbeing.

What is the data and other evidence underpinning identified impacts?

Provide information about the nature of the evidence, including key references.

Provide evidence on the impact of capital works projects and how they affect wellbeing (e.g. road works may cause short-term dissatisfaction for people when commuting; however may eventuate in greater road safety).

Where quality and trusted data to measure wellbeing impact does not currently exist, identify whether data and evidence will be acquired through the implementation process (including in relation to expected outcomes).

- When citing data or statistics it is recommended to include at least author, creator, date of publication, title or description, publisher, and URL or DOI if the dataset is available online.
- The Wellbeing measures reported at www.act.gov.au/wellbeing are a possible source of evidence – but not every proposal will map neatly to an existing measure or indicator in the dashboard. Provide the evidence base that supports the documented impacts, whether it is part of the dashboard or not.

6. Accountability/evaluation

Requirement: Describe the evaluation plan for this proposal.

A high-level evaluation plan identifying the key points and scope is required to measure or capture this proposal's effect upon the wellbeing of Canberrans, who will be affected by it and whether the value proposition has been achieved.

This should include:

- type of monitoring or evaluation that would be most useful given the evidence base for this initiative (for example, post-implementation review of the delivery, ongoing evaluation throughout the initiative, formal evaluations etc)
- advice on the information necessary for measuring progress – including in relation to proposed outcomes - and whether it is currently collected or new.
- a preliminary assessment of how the initiative could be evaluated and advice on whether it is a priority for measuring wellbeing

Where the proposal relates to an existing policy or program, has that policy or program been evaluated in framing this proposal?

7. Key relationships

Requirement: Describe this proposal's plan for collaboration and consultation across government and with community stakeholders.

There may be changes needed beyond your work area or agency for your proposal to be effective. What are they and who has been/should be involved?

Cross-agency collaboration within and across government, if applicable, should be leveraged to draw upon existing expertise and to maximise resources.

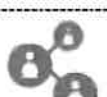
Key stakeholders, within government and/or external stakeholders in the community, should be consulted during policy development for this proposal. Outline the process whereby stakeholders have or will be enabled to provide their input, identifying any possible barriers to engagement.

If such consultation and collaboration has already been undertaken, please identify which diversity offices (such as the Office for Aboriginal and Torres Strait Islander Affairs and the Office for Women) or agencies were involved and what the outcome was.

8. Wellbeing domain

Requirement: Identify the wellbeing domain that pertains to the impact(s).

Each impact should map to only one domain, noting a proposal may have multiple impacts and therefore map to multiple domains.

Domain		Definition	Our aspiration for wellbeing in this area
Access and connectivity		Getting around to places we value and accessing the services we need	Our planning, mobility and service systems allow us to move around our liveable city and access the types of places and services we need, when we need them. Those who require additional support to gain independence can access responsive, tailored services.
Economy		We share in our city's economy	A strong economy, business and innovation sector creates opportunities for all Canberrans to share in the wealth of our city.
Education and life-long learning		Gaining the skills and education needed at all stages of life	Canberrans have equitable access to education and learning opportunities, through all ages and stages of life, to develop and gain the skills needed to live life well.
Environment and climate		The environment sustains all life now and into the future	Canberra's natural environment sustains all life, is accessible, climate resilient, and clean.
Governance and institutions		Having a say, being heard, and working together for better outcomes	All Canberrans can have their say, connect with and be part of key government processes. Canberrans have a government and other institutions that respect human rights, are responsible, reliable, have integrity, are open, and are fair.
Health		Being healthy and supported with the right care	Canberrans have good physical and mental health at every stage of life and can access the services they need to lead healthier lives and manage illness. Individuals take steps to proactively maintain good health with the support of health-promoting environments.
Housing and home		Having a place to call home	Canberrans have access to secure, suitable and affordable housing throughout their lives.
Identity and belonging		Being able to express identity, feel a sense of belonging, and participate fully in society	All Canberrans can participate on equal terms, regardless of age, gender, sexual orientation, cultural background or disability. Aboriginal and Torres Strait Islander people have a strong voice, are decision makers on issues that impact them, and lead in the achievement of positive life outcomes. We are proud to be Canberrans.
Living standards		Having the financial resources to live life well	Canberrans can be economically secure and have the means to help manage their lives.
Safety		Feeling safe and being safe	Canberrans are and feel safe and secure around their families, homes, community and on-line.
Social connection		Being connected with family, friends and community	Canberrans are connected and supported within our community and come together in areas such as sport, culture, spirituality, religion and the arts.
Time		Having time to live life well	Canberrans have the time to do things we want to as well as the things we are required to do.

Proposal Name FOGO Facility	TCCS	Wellbeing Impact 1
Impact description • In the 2019-20 Budget, \$973,000 was provided to undertake early planning for a FOGO waste facility and service, including assessing potential products and marketing solution; an option analysis for a new household collection service from October 2023 for collection of food and garden waste from all households; and the development of a business case for delivery of a FOGO processing facility. • The 2020 Food Organics and Garden Organics (FOGO) Directions Paper and Feasibility study, which were funded from the 2019-20 Budget, proposed to expand the existing opt-in garden organics collection to a mandatory food and garden organics service (FOGO) for households. This will achieve goals set out in the ACT Climate Change, ACT Waste Management Strategy and ACT Parliamentary and Governing Agreement (PaGA) of the 10th Assembly. The most appropriate technology has been identified as an in-vessel composting (IVC) facility, that focusses on ACT household feedstock. • The proposed service is expected to recover an estimated 42,000 tpa of FOGO feedstock by 2023, made up of approximately 70% garden organics and 30% food organics. The facility will be sized for at least 50,000 tpa of processing capacity, and no major expansion works is expected within the first 15 years of operations. • This budget initiative provides for the design, construct, build, operate and maintenance of the FOGO facility. In addition to the reduction of greenhouse gas emissions from landfill, directing FOGO feedstock away from the landfill will also support the reduction of the impacts on the quality of surface and groundwater, foul odour and several carriers of diseases at landfill sites. Consequently, this will result in reduced waste management costs, reduced human exposure to untreated waste, capacity development of local farmers by enhanced soil productivity, and significant job creation with the development and ongoing operation of a dedicated composting facility.		
Who is affected? This solution is expected to address the problems included in the statement of need, identified in the Investment Logic Workshop through delivering the following benefits: • Community satisfaction for all residents with services provided • Improving the impact and longevity of the natural environment • Creating value from waste streams available to the community and the environment • Reducing the impact of waste disposal on the community		
Direction and type of impact Positive - major		
Timeframe Between one and five years		
Evidence base and data The ACT government is committed to delivering real and lasting improvement in waste management and resource recovery for the ACT. This is in support of the Territory's wider commitments to pursuing prosperity, quality of life and emissions reduction by embracing circular and sustainable waste management. This Business Case, led by the ACT No Waste Department, aims to implement a best practice household waste management processes for the ACT. The purpose of this project is to reduce the negative impacts of organic waste to the community and environment 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" • Meet the ACT Parliamentary Agreement Policies which reinforces ACT Government's commitment to deliver an organic waste processing facility for households and business, and improve household and business waste reduction, along with further education provided to the community to drive behavioral		

change.

- 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
- Support carbon neutrality of the waste sector
- Help redirect from landfill the c.50% of organic material in the domestic and commercial waste stream, and

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.

Accountability and evaluation

- 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, 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.
- There are 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. In 2020-21 emissions from landfill were 159 kt CO₂-e¹, having risen ~25-35% year-on-year over the past three years, representing 10% of the ACT's total net greenhouse gas emissions.
- The Territory has commenced services for a FOGO pilot in November 2021. Information and data gathered from FOGO pilot will inform the city-wide roll out of FOGO collections to households. After 6 months of the commencement of the FOGO pilot service a full evaluation will be able to inform the level of participant support for the FOGO pilot, amount of contamination across all households and the level of understanding of the service from households. This data will then be incorporated into the education and community engagement program which will commence at least 6 months prior to the commencement of the facility and collection service. The design and construction of the facility will not be impacted by the data collection and community engagement and education process.

Key relationships

Consultation during the Feasibility, EIS Scoping and Business Case stages of the project was limited to key stakeholders whose input was required to inform into the project planning and design. Targeted stakeholder engagement will proceed in the future phases of the project's planning and delivery. Key government stakeholders have participated in critical workshops, received regular updates and provided reviews of project deliverables. A stakeholder register has been developed that includes the Stakeholder Engagement Plan.

Key Stakeholders for the project include:

- Territory Departments
 - ACT NoWaste
 - TCCS Infrastructure Delivery
 - ACT Treasury
 - Major Projects Canberra

¹ https://www.environment.act.gov.au/data/assets/pdf_file/0003/1918038/ACT-Greenhouse-Gas-Emissions-Inventory-Report-2020-21.pdf

- EPSDD
- EPA
- Procurement ACT
- WorkSafe
- Potential bidders
- Local Community
- Adjacent Tenant
- Special interest groups
- Collections contractor(s)
- Indigenous communities

Wellbeing domain

Economy and

Environment and climate

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

User Charge PPP	5	Incentivises for whole-of-life cost savings for maintenance and operations
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Output Specification

Delivery Model	Score: Output Specification	Justification
Design then Construct	1	ACT would need to provide a detailed functional specification. The ACT lacks technical expertise in this area.
Design Construct Maintain (Short Term)	4	
Design Construct Maintain (Long Term)	4	The ACT would need to have input into the ongoing operations of the facility in its design, so would need to have more control over the design and construction process.
Design Construct Maintain Operate	5	ACT can specify project requirements in function and service quality standards (i.e., processing of organic waste to produce a valuable compost in a safe and environmentally sensitive manner) rather than in terms of prescriptive design inputs.
User Charge PPP	5	ACT can specify project requirements in function and service quality standards (i.e., processing of organic waste to produce a valuable compost in a safe and environmentally sensitive manner) rather than in terms of prescriptive design inputs.

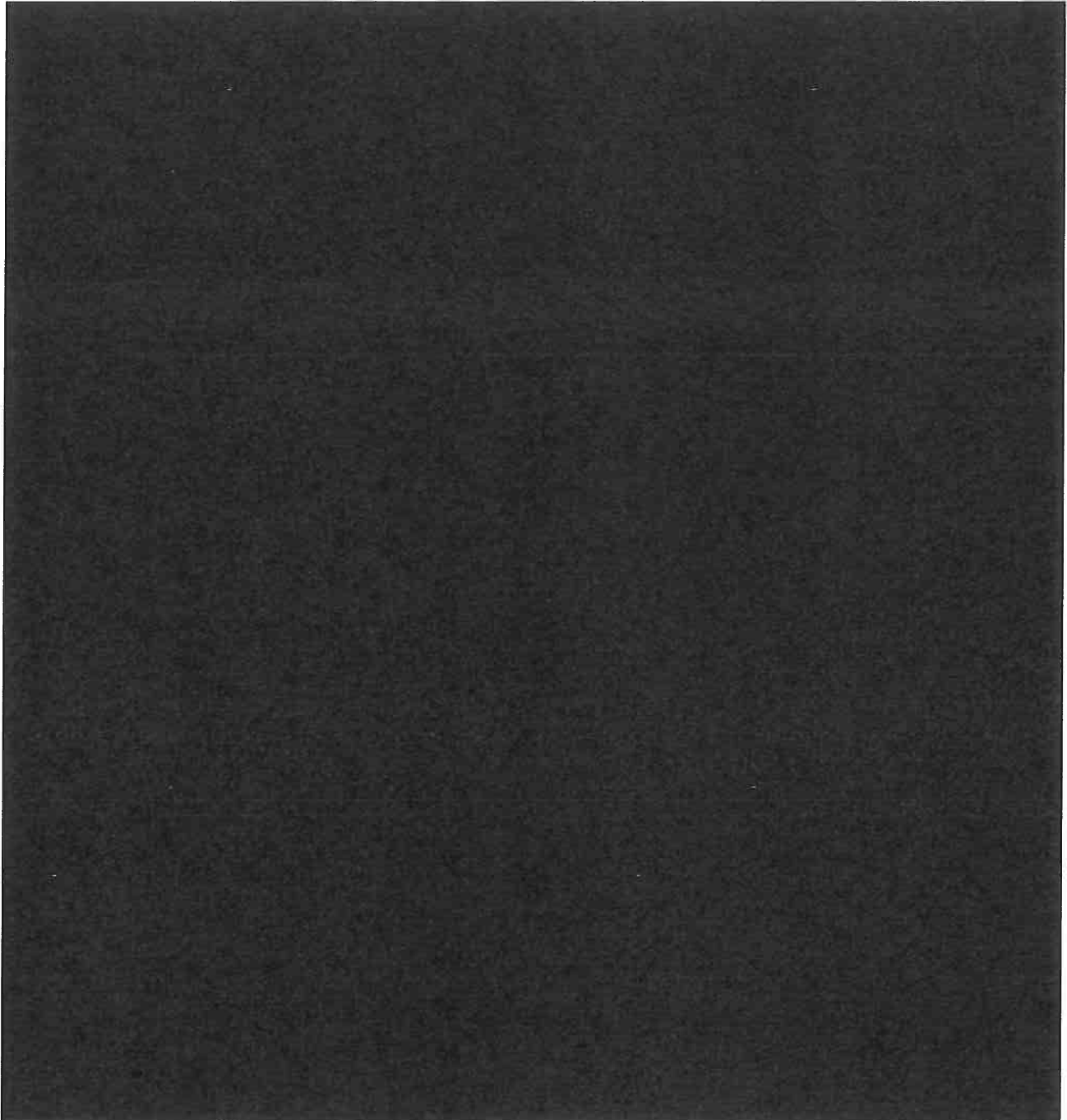
Cost and level of complexity for Government

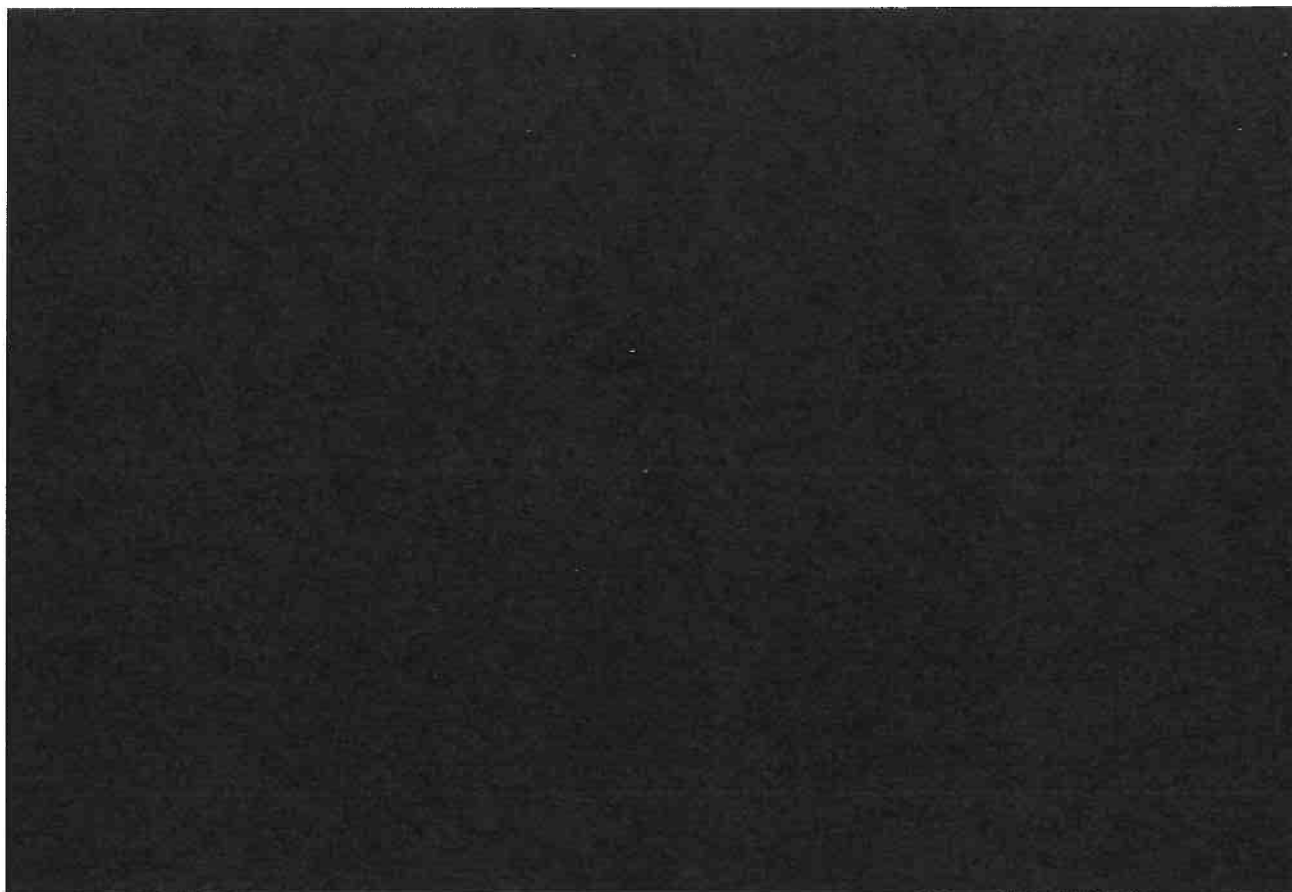
Delivery Model	Score: Cost and Level of Complexity for Government	Justification
Document & Construct	5	Relatively straightforward contract structures and documentation. Procurement process is well understood by ACT and efficient to implement. ACT is responsible for ongoing operations (either itself or through separate contractual arrangement with an operator). Complexity in managing the multiple interfaces.
Design & Construct	5	

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 21: Detailed assumptions for operational costs





4.3 Contingency

Contingency has been considered as any risks that cannot be mitigated by the measures outlined in the Risk Management Plan included in Appendix E. Delivery Model Contingency has been assessed only for risks that have been quantified as part of the risk assessment.

Risks that either remain high after mitigation or occur during design or construction have been quantified. Quantification has been undertaken using the following approach:

1. Qualitative analysis of risks prior and post mitigation
2. Quantitative assessment of risks that either remain high after mitigation or occur during design or construction
3. Estimate proportion (%) of risk that is transferred to the Contractor
4. Estimate the probability of the risk event occurring
5. Estimate the range of impact on the cost or revenue driver
6. Monte Carlo Analysis

Monte Carlo Simulation

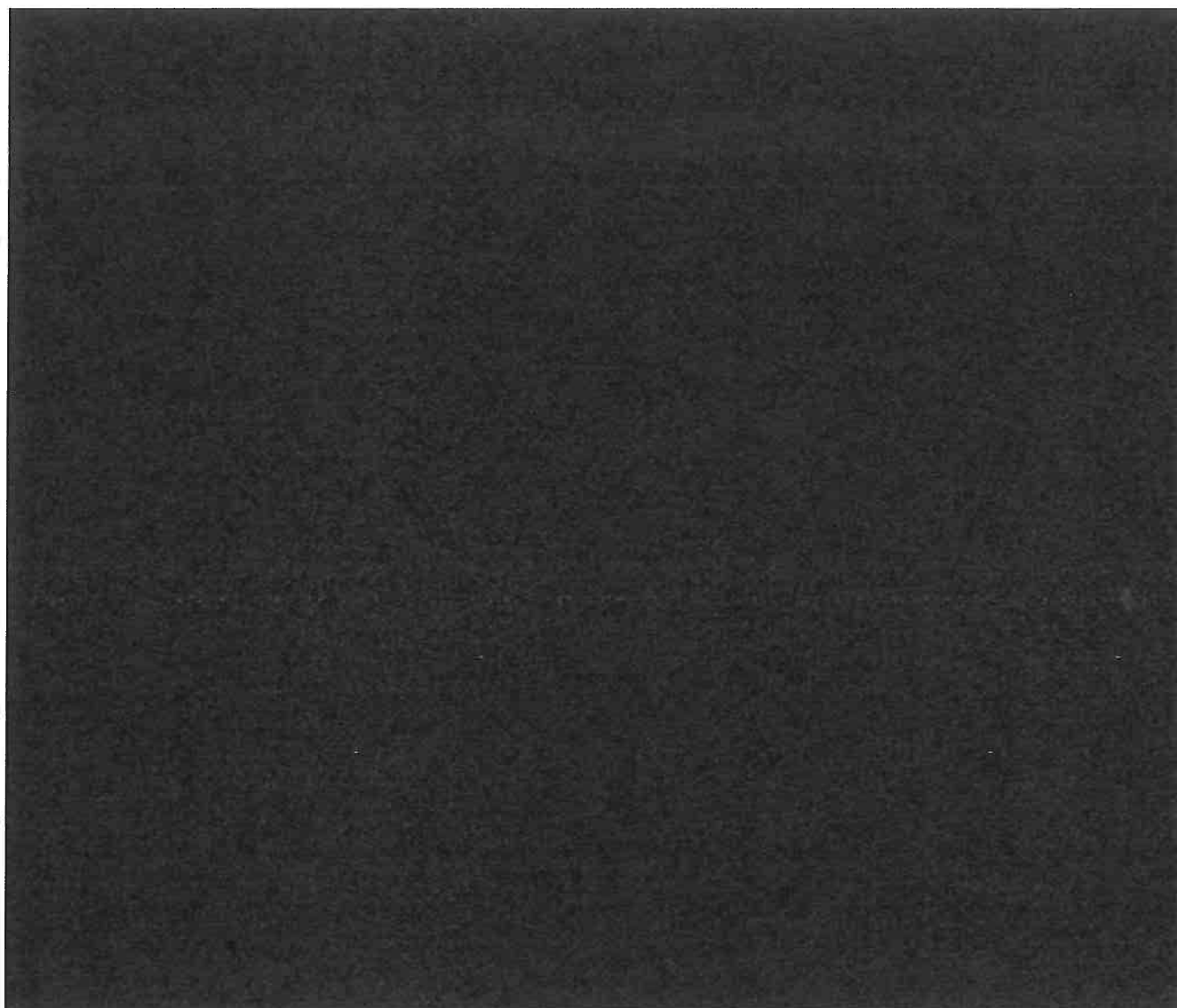
As aforementioned, a probabilistic risk assessment using Monte Carlo simulation has been carried out on key contingent project risks.

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.

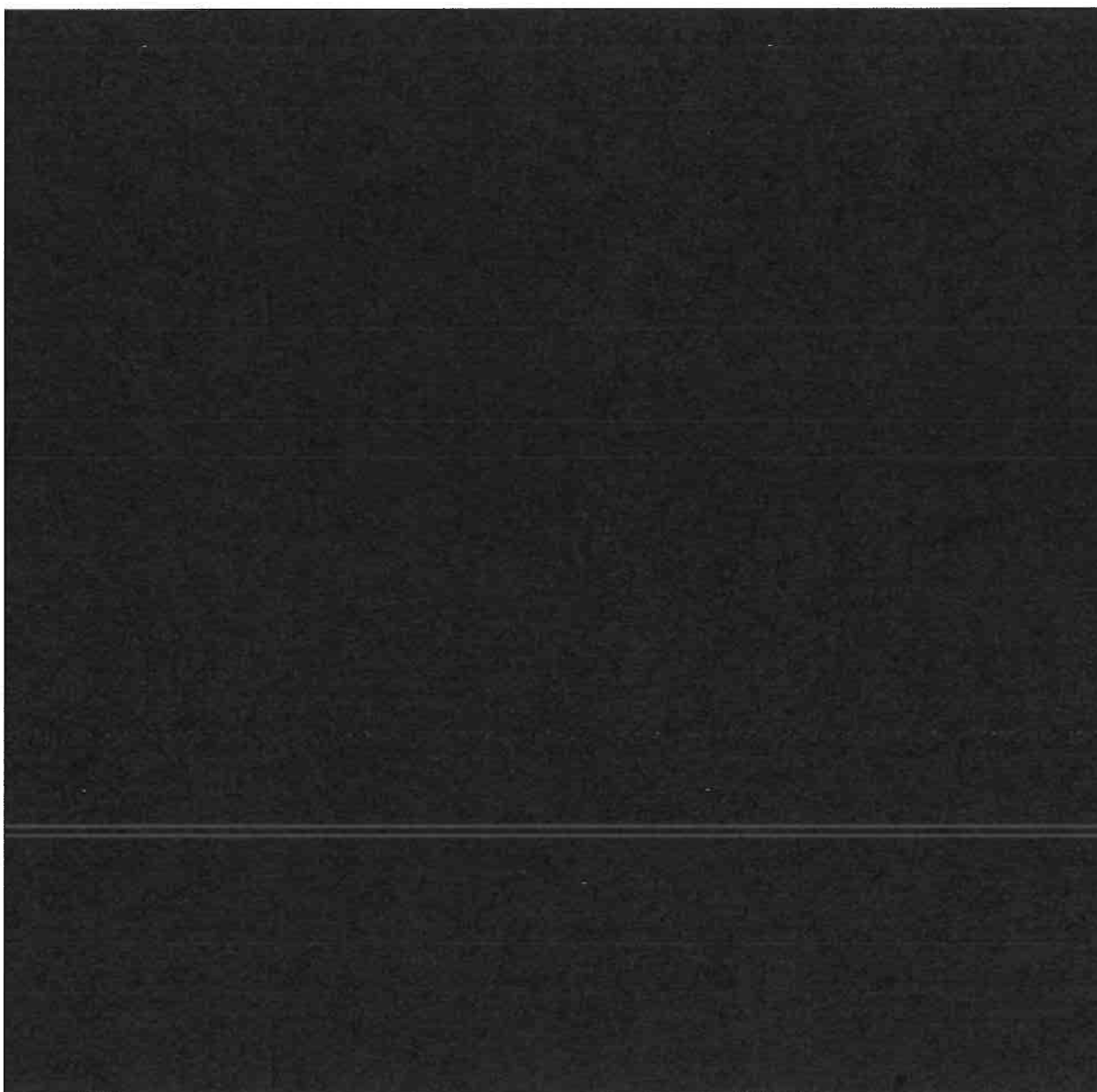
Table 22: Risk quantified through Monte Carlo simulation



P90 risk allowances are generated by undertaking a Monte Carlo simulation of 10,000 iterations and assigning a PERT distribution to all risks. A PERT distribution is a continuous probability distribution which is defined by the minimum, most likely and maximum values. It is widely used for risk analyses due to the intuitive nature of the input parameters. The PERT differs from a triangular distribution in such that it has a smoother shape and places a greater emphasis on the most likely value.

Below is a summary of the high-level outputs from the risk analysis with the complete analysis presented in in Appendix H.

Table 23: P90 contingency risk adjustments



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 24: Preliminary Financial Impacts Summary (\$ nominal FY 2021)

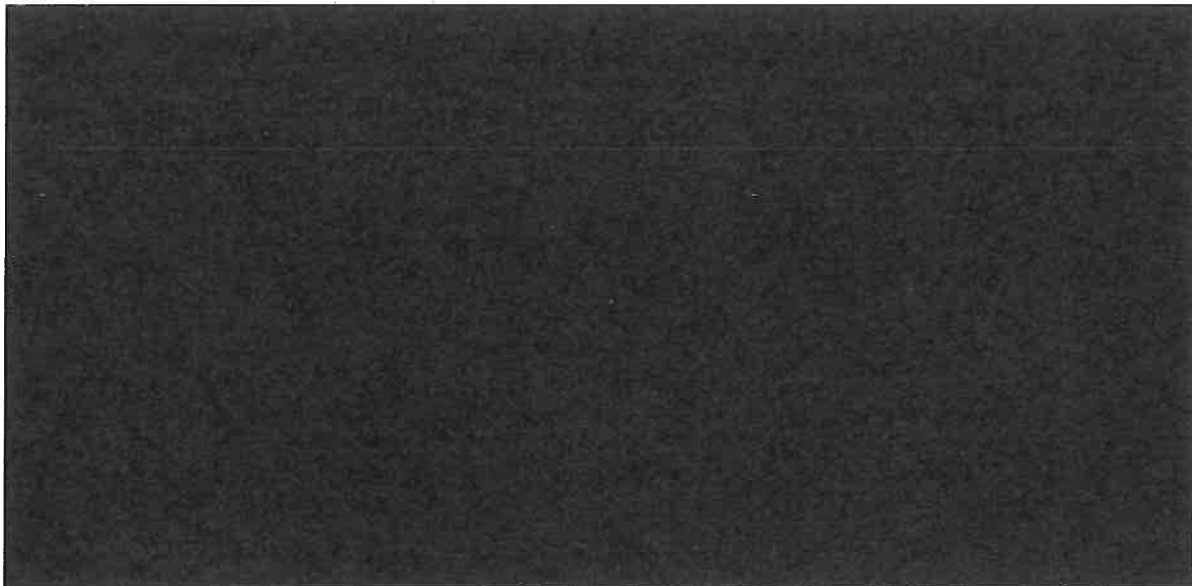


Table 25: Staffing Impacts Summary

Impact	2020-21	2021-22	2022-23	2023-24
FTE	Nil	Nil	Nil	Nil

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 26: 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

5.1 Cost Benefit Analysis

A Cost Benefit Analysis (CBA) captures the quantifiable economic, and social and environmental benefits of the project in measurable cash flows. The CBA assesses the economic costs and benefits, comparing the options against the base case so that the incremental costs and benefits can be identified.

The following table summarises the costs and benefits were included as part of the CBA for both the base and project Case.

Table 27: CBA Costs and Benefits

Element	Category	Base Case	Project Case
Costs	Construction Costs	No capital costs.	• Design • Construction
	Operating and Maintenance Costs	No change in operating costs. Assumes that the diversion of FOGO from landfill will not change operating, maintenance or staffing costs.	• Staffing • Education costs • Fixed O&M Costs (Maintenance Allowance, Lease Costs, Insurance, Admin etc) • Variable O&M costs • Landfill costs
Benefits		No Benefits	• Reduced Greenhouse Gas Emissions (GHG) • Delayed landfill investment • Reduction in leachate

The CBA has been developed to be compliant with ACT Treasury Guidelines and integrates the National Greenhouse Accounts Factors on Greenhouse Gas Emissions. Table 28 summarises the key parameters that underpin this analysis.

Table 28: CBA Key Parameters

Element	Category
Discount year	FY 2021
Discount rate	%
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 (MH₄) emissions using the conversion factors summarised in Table 29 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.

²⁰ReputTex 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/>

Table 29: Greenhouse gas conversion factors for landfill

Item	Value	Source
Landfill – Food waste conversion factor	2.1	National Greenhouse Accounts Factors, Department of Industry, Science, Energy and Resources - Table 45
Landfill – Garden and Green waste conversion factor	1.6	National Greenhouse Accounts Factors, Department of Industry, Science, Energy and Resources - Table 45
Capture rate	75%	Australian Clean Energy Regulator - NGER Technical guidelines for the estimation of emissions by facilities in Australia

The project case uses the composting equations provided in the National Greenhouse Accounts Factors to calculate the methane and Nitrous Oxide emissions. These are summarised in the table below. There is assumed to be no recovery of methane, as this is only relevant for an Anaerobic Digester Facility.

Table 30: Greenhouse gas conversion factors for composting

Item	Value	Source
Methane Emissions Factor (per tonne)	0.021	National Greenhouse Accounts Factors, Department of Industry, Science, Energy and Resources
Carbon Equivalent Factor (Methane)	28	National Greenhouse Accounts Factors, Department of Industry, Science, Energy and Resources - Table 30
Nitrous Oxide Emissions factor	0.025	National Greenhouse Accounts Factors, Department of Industry, Science, Energy and Resources
Methane Carbon Equivalent Factor (Nitrous Oxide)	265	National Greenhouse Accounts Factors, Department of Industry, Science, Energy and Resources - Table 30

Delayed landfill investment

This benefit monetises the variation in costs resultant from extending the Mugga Lane landfill life. This is a result of the diversion of FOGO waste to the new facility, in turn deferring expansion / new

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 31: 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 [REDACTED] (2006) and escalated to 2021 values for the economic analysis.

5.1.2. Results

Table 32 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

discount rate. This indicates that the project does have some economic benefits, however, they do not outweigh the costs of the project. Although this is the case, it is key to note that the project has a number of non-quantifiable benefits that should be considered as well as the outcomes of the CBA.

Table 32: CBA results (\$ discounted, FY 2021)

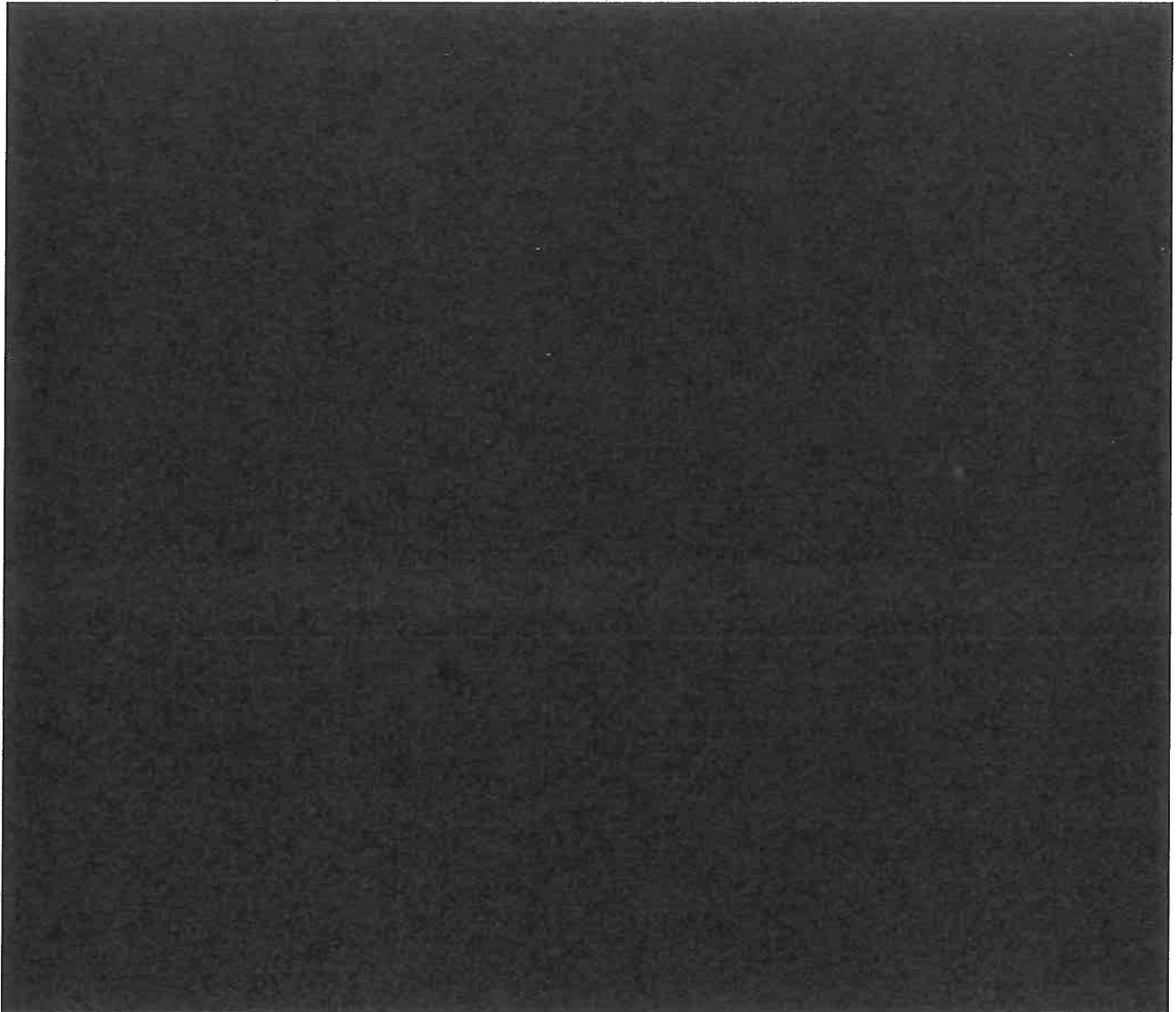
Element	FOGO Facility
Costs	
Capital Costs	████████
Operating Costs	████████
Total Costs	████████
Benefits	
GHG Benefit	████████
Land Fill Closure Cost Delay Savings	████████
Leachate Saving	████████
Total Benefits	████████
Summary	
Net Present Value (NPV)	(34,200,348)
Benefit-cost Ratio (BCR)	0.56
Internal Rate of Return (IRR)	N/A

5.1.3. Sensitivity Analysis

Due to the early stage of project development, a detailed sensitivity analysis has been completed to understand the impact that uncertainties around the Project and its parameters may have on its economic impact.

Table 33 summarises the sensitivity analysis undertaken for the preferred option with respect to the Central Case. The Central Case is the results for the preferred option, with no sensitivities applied, using a discount rate of 7%.

Table 33: Sensitivity Analysis (\$ Discounted, FY 2020)



5.1.4. Social Analysis

Studies regarding the social aspects of a circular economy, in this case employing a waste recovery strategy, have identified several social benefits. Employment being the primary impact on the community, followed by quality, wellbeing and willingness to pay for food composting.²²

Employment

Investment in the FOGO facility will create employment opportunities during construction and operations. Based on a 2009 NSW Treasury Paper, for every \$1m spent in Construction Trade

²² MDPI, *Addressing the Social Aspects of a Circular Economy: A Systematic Literature Review*, 24 September 2020

services, there are 7.2 jobs created.²³ For a '\$40m level of investment, this could be a total of ~30 construction jobs.

Additionally, as the government invests in greener policies, supports circular-based economies, and creates better waste management systems, additional jobs are expected to be created during the operating phase. Based on analysis of the proposed facility and its operations an additional 10 Full Time Equivalent (FTE) jobs, as well as 1 FTE for the education rollout, are expected to be realised.

These employment opportunities, higher in the waste hierarchy, create opportunities for higher skilled work in ACT in the waste sector. This transition will be reliant on upskilling of workers through providing necessary skills and training.

Health and wellbeing

Diverting organic waste from landfill has the potential to improve the quality and wellbeing of the public through the improvement of air quality – by subsequent reduction of air pollution and GHG production – as well as the reduction of leachate production.

Depending on local circumstances, leachate can find its way into the water table, which can result in considerable damage to community health. As such, by investing in diverting waste away from landfill, there is a significant reduction in risk to these water supplies.

Willingness to pay for food composting

According to a paper by the Australian National University that looked at Brisbane households, on average Brisbane households' willingness to pay (WTP) is an additional \$32 to \$35 (\$2011) per year for a general waste bin where food waste is split from general waste.²⁴ Brisbane households were seen to be a close comparison to the ACT, particularly as they have relatively similar average weekly earnings.

Based on advice from ACT NoWaste, at this stage additional Council Rates to pay for the FOGO facility should not be considered within the analysis. As such it has been assumed that all households receiving the new FOGO bins capture this WTP benefit.

This incorporates the community's willingness to pay for decreased landfill costs, sale of recyclables, environmental externalities and reduced resource. As it is unclear the proportion of benefits attributed to benefits already calculated in the CBA, this WTP benefit has been expressed as a quantitative benefit.

Households participating in the scheme are broken down by Single Unit Dwellings (SUD) and Multi-Unit Dwellings (MUD). The number of households has been based on the ACT NoWaste 2020

²³ NSW Treasury, Employment support estimates – methodological framework, 2009

²⁴ Robert Gillespie & Jeff Bennett, 2011. "Willingness to pay for recycling food waste in the Brisbane Region," Environmental Economics Research Hub Research Reports 1096, Environmental Economics Research Hub, Crawford School of Public Policy, The Australian National University.

dwelling count forecast using EPSDD new dwelling occupancy projections 2018-2047. The WTP benefit would be realised on a per household basis, regardless of the number of occupants.

The number of households participating in the scheme is outlined in the table below.

Table 13: Number of households expected to be onboarded

Year	2024
MUD FOGO-onboarded Dwellings	6,063
MUD FOGO incremental onboarded Dwellings	3,832
SUD FOGO-onboarded dwellings	249,821
SUD FOGO incremental onboarded dwellings	116,490

5.1.5. Environmental Analysis

The implementation of this project positively impacts the environment through creating an activated waste sector. Benefits include:

Improved water quality

The primary method of waste disposal in ACT is landfill which has negative environmental impacts through leachate discharges, greenhouse gas emissions, loss of visual amenity, foul odours and harbouring of disease-carrying pests. The other alternative that is often used is incineration which can produce toxic emissions if not controlled properly. Preventing organic wastes going into landfill has the potential to reduce the potency of leachate infiltrating into the groundwater and impacting water quality.

5.2 Wider Economic Benefits

Wider economic benefits are the improvements in economic welfare that are not typically captured in a CBA. These benefits are generally difficult to quantify and have been presented qualitatively.

The FOGO processing facility along with the resultant recycled organics, should have a wide range of wider economic benefits that bring added value to the Territory, public and industry. These benefits are outlined in the sections below.

Improved agriculture productivity

The benefits of organic compost for soils for agriculture crops and landscape maintenance far outweighs the use of synthetic fertilisers. Organic fertilisers have a greater capacity to hold and store nutrients, increasing soil fertility and as such soil organic carbon. Additionally, compost can aid in

restoration of soils contaminated by hazardous waste and is also a cost-effective solution over water and air pollution remediation technologies.²⁵

Australian soils are generally low in organic carbon, a key indicator of soil fertility. Using compost improves soil fertility and promotes healthy plant growth through its macro and micronutrients (often absent in synthetic fertilizers), reduced nitrogen leaching properties and its ability to release nutrients slowly over time.

Additionally, a study in Adelaide²⁶ found typical yield in various agricultural industries improved by 12% by using high-quality compost made by recycled organics. This is due to savings from water efficiency. Organic compost products support water efficiency as it helps soil retain moisture increasing its water holding capacity. It is also estimated that “the combined gross crop productivity benefit for use of compost within the viticulture, horticulture, cut flower and nursery industries is about \$102/tonne of organic product applied”.

As such, this can result in lower maintenance of landscapes and agricultural crops as well as a reduced reliance on synthetic fertilizers.

Contribution to the circular economy

Using high-quality compost derived from recycled organics is sustainable, replacing soil nutrients and improving structure when the quality is poor. Compost can be used to replace topsoils, reducing the need to source virgin material from environmentally sensitive areas. It can return organic carbon to the soil where it can be stored as opposed to being emitted in the form of methane.

An economic analysis report assigned by the Australian Organics Recycling Association found “7.5 million metric tons of organics recycled puts more than \$2 billion into the country’s economy”.²⁷ The sources of recycled organics includes municipal and council wastes, commercial and industrial and construction and demolition waste. Additionally, a report prepared by KPMG about circular opportunities in the food industry and their potential GDP and employment impacts further supports the value and employment opportunity that a FOGO facility could help to unlock.²⁸

²⁵ EPA, *Reducing the Impact of Wasted Food by Feeding the Soil and Composting*, 2020 retrieved from <https://www.epa.gov/sustainable-management-food/reducing-impact-wasted-food-feeding-soil-and-composting>

²⁶ EPA, Consultancy report: Organic waste economic values analysis, 2002
http://report.epa.sa.gov.au/files/8451_organic_waste.pdf

²⁷ BioCycle, *how much do organics recycling businesses contribute to Australia’s economy*, 2020 retrieved from <https://www.biocycle.net/much-organics-recycling-businesses-contribute-australias-economy/>

²⁸ KPMG, *Potential Economic Pay-off of a circular economy*, 2020 retrieved from <https://assets.kpmg/content/dam/kpmg/au/pdf/2020/potential-economic-pay-off-circular-economy-australia-2020.pdf>

Opportunity	Description	Real GDP (2047-48, present value \$million)	Employment (2047-48, FTE)
Food			
Nutrient recovery and recycling	Converting nutrients in organic waste into fertiliser	1,597	233
Biogas from organic waste	Converting organic waste to renewable energy	8,834	823
Water use efficiency	Improving the efficiency of water use	29,899	4,510
Food waste	Reducing waste in the consumption of food	37,141	-2,936

Figure 11: Circular opportunities in the food industry

Currently landfilling is used in the ACT is a linear approach in waste management. FOGO processing, managed effectively can be a part of the circular economy for food that helps rebuild soil health, recovers valuable resources, and provides feedstock for energy plants.

6. Delivery Model Analysis

6.1 Outline of Key Risks

This chapter explores the viable delivery model options available for implementation of the project. Key to the analysis was developing an understanding of project risks, how they could be managed / mitigated, and the level of risk transfer that may be achieved under the procurement models under consideration. The process undertaken with respect to analysis of risk management is summarised in Figure 12 below. This process included holding risk workshops and undertaking qualitative and quantitative assessments to assess the risks involved in pursuing the project.

These risks have been used to quantify delivery model contingency outlined in Appendix J – Delivery Model Shortlisting. This is the value of retained risks and the impact to cost. For this project, these contingencies have been applied in both a DCMO delivery model and traditional Government Procurement, with total quantified risk, not just retained risk, applied to the Government Procurement alternative. Additionally, this risk assessment, and resultant cost implications have been used in the assessment of delivery models, integrated into the Value for Money Assessment (Financial Analysis) outlined in Section 7 below.

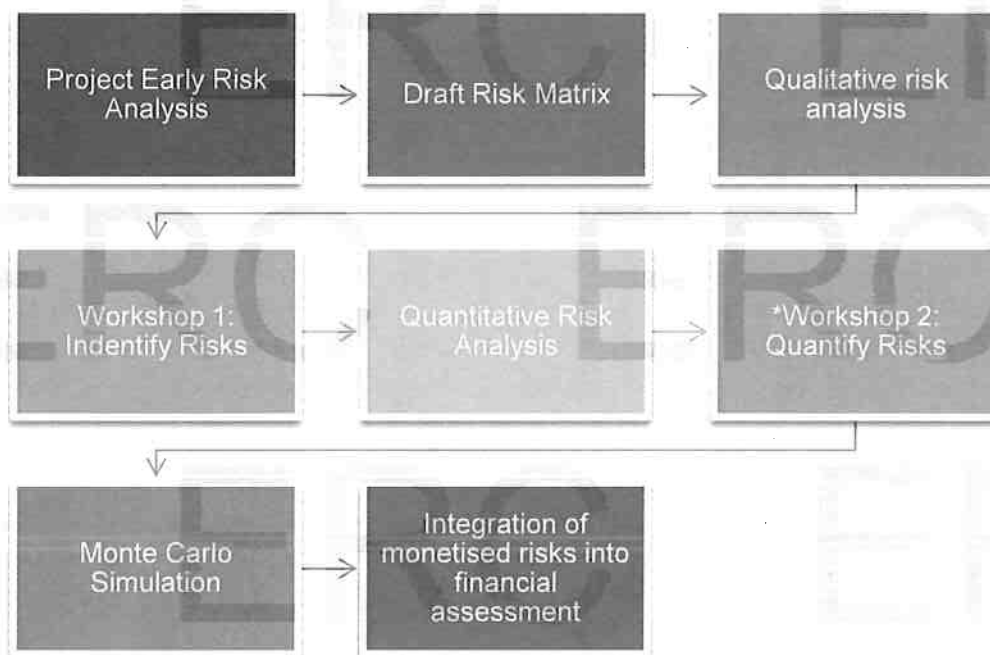


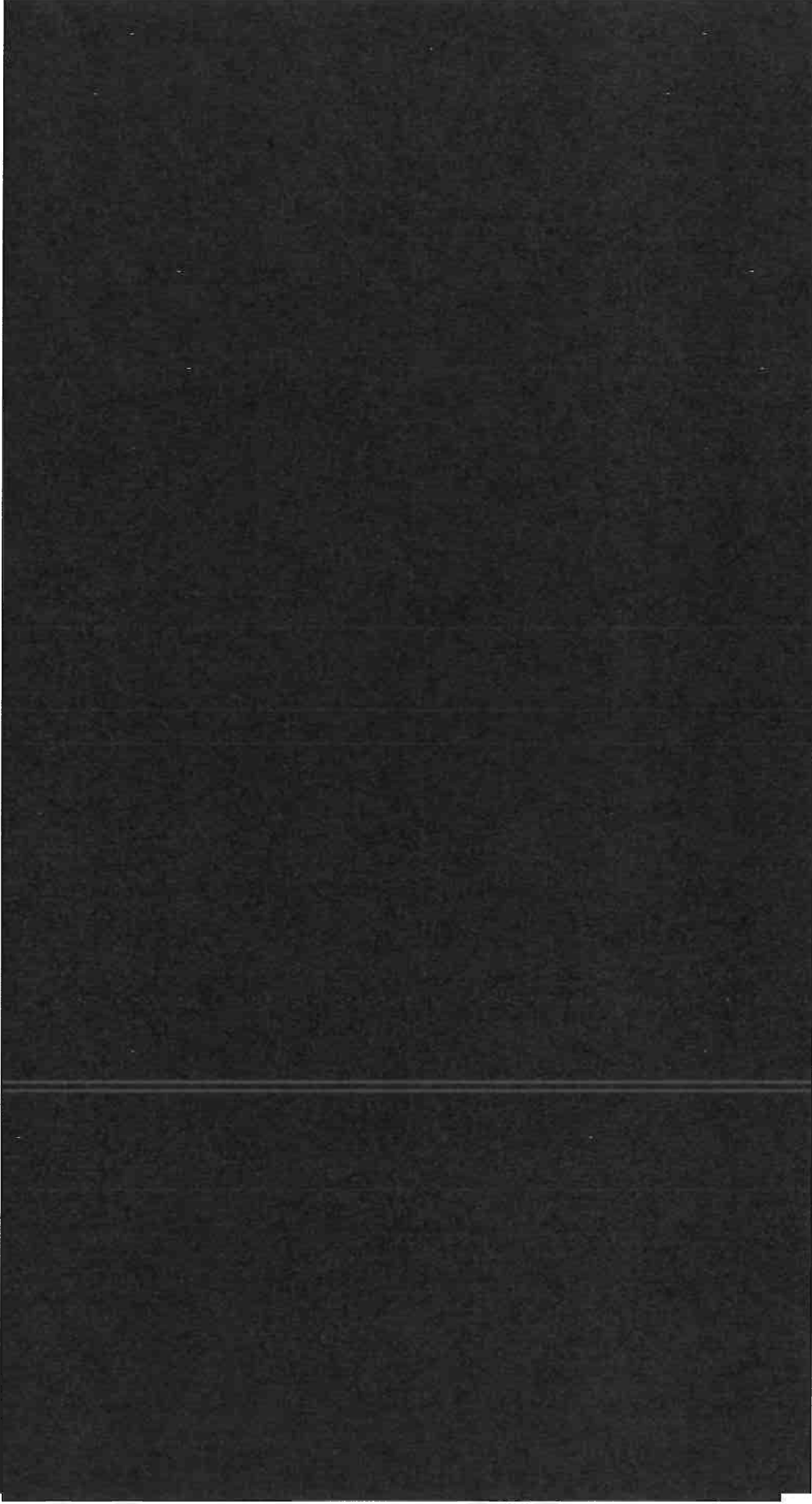
Figure 12: Risk management process

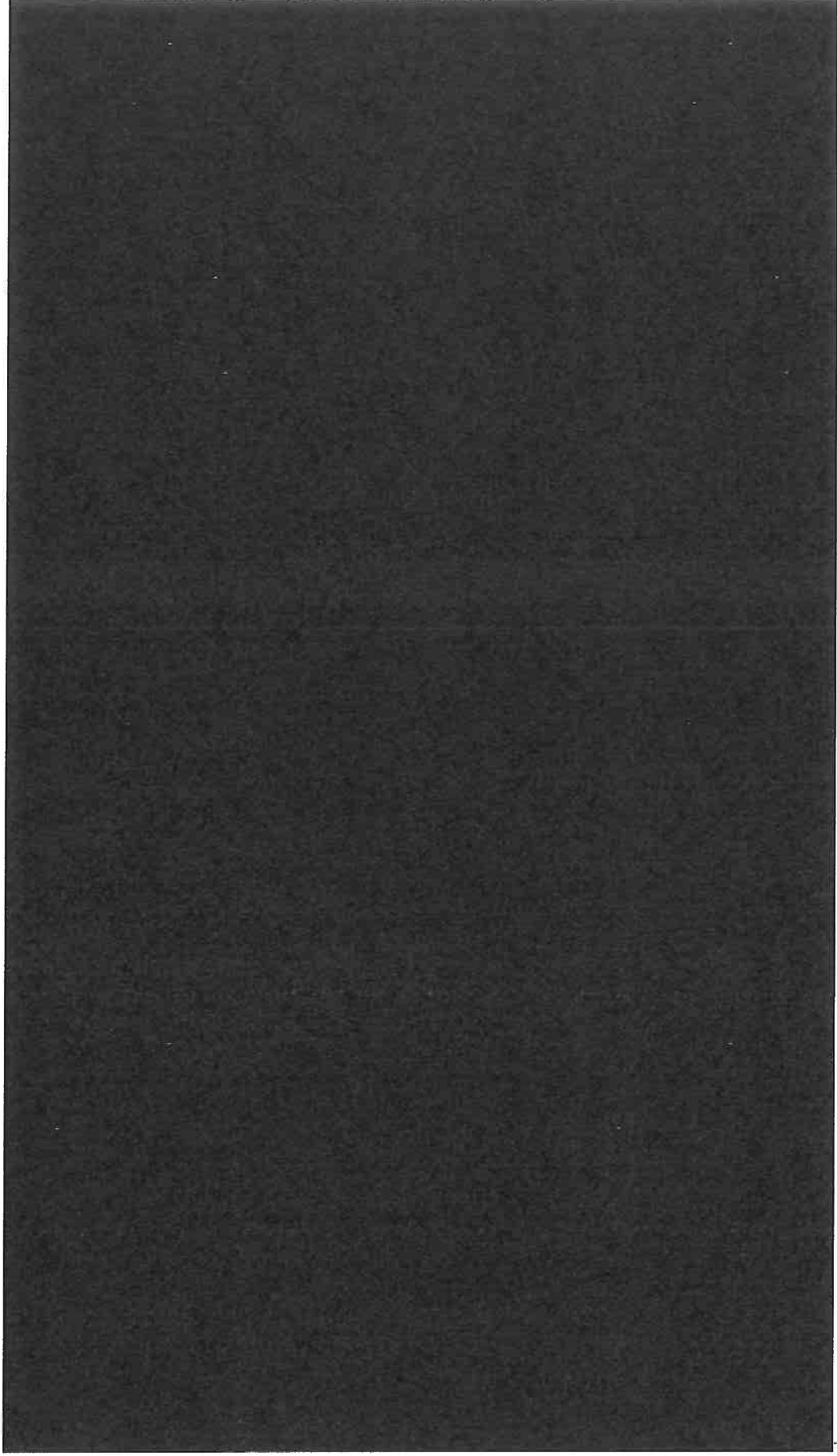
**outcomes validated over email with ACT NoWaste*

The following risks summarised in Table 34 have been identified as relevant to the project are detailed further in a Risk Register in Appendix C. Further to this a detailed assessment of the causes,

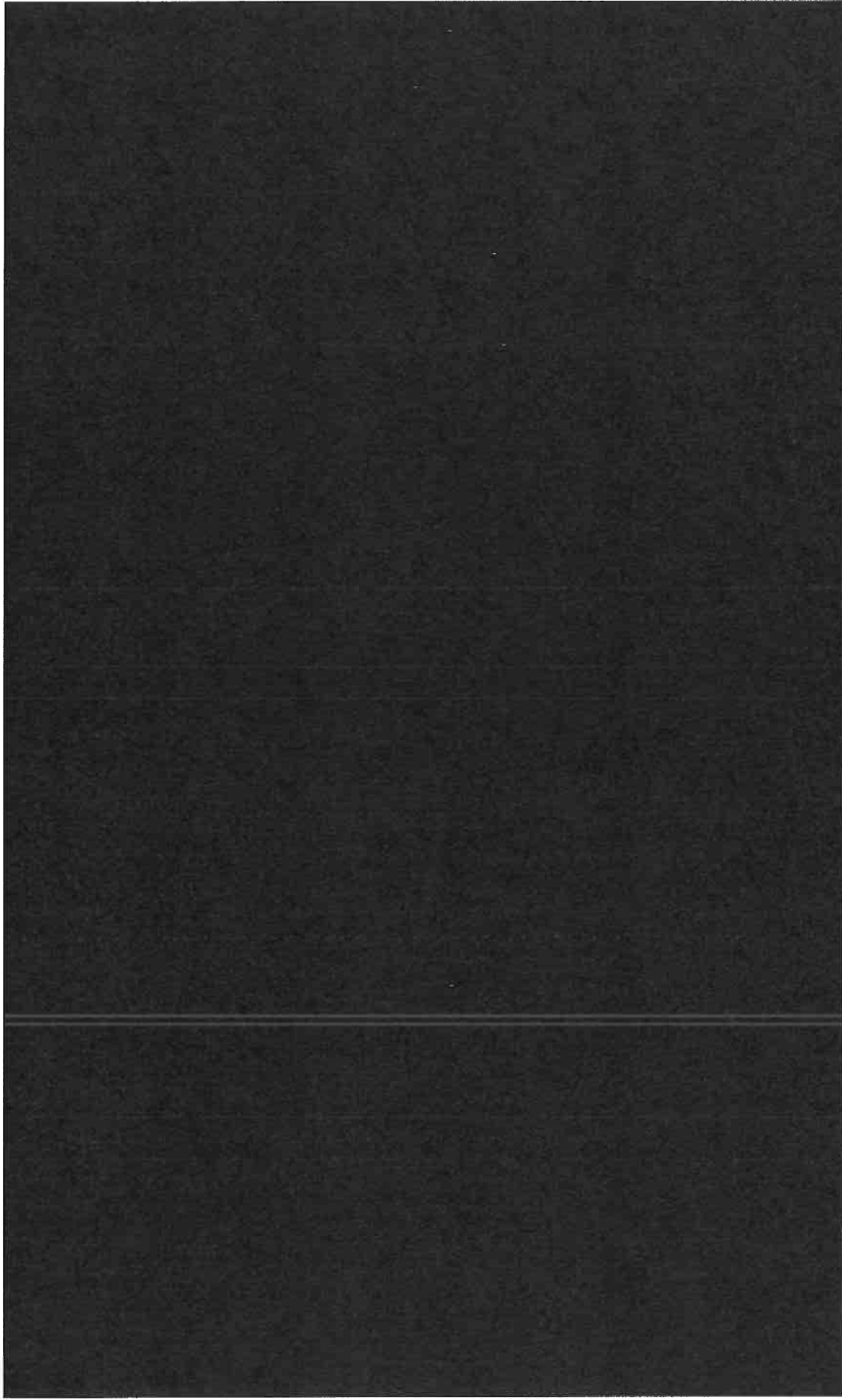
impacts and potential mitigations of the risks considered in the Risk Management Plan in Appendix E.

Table 34: Project Risk Summary



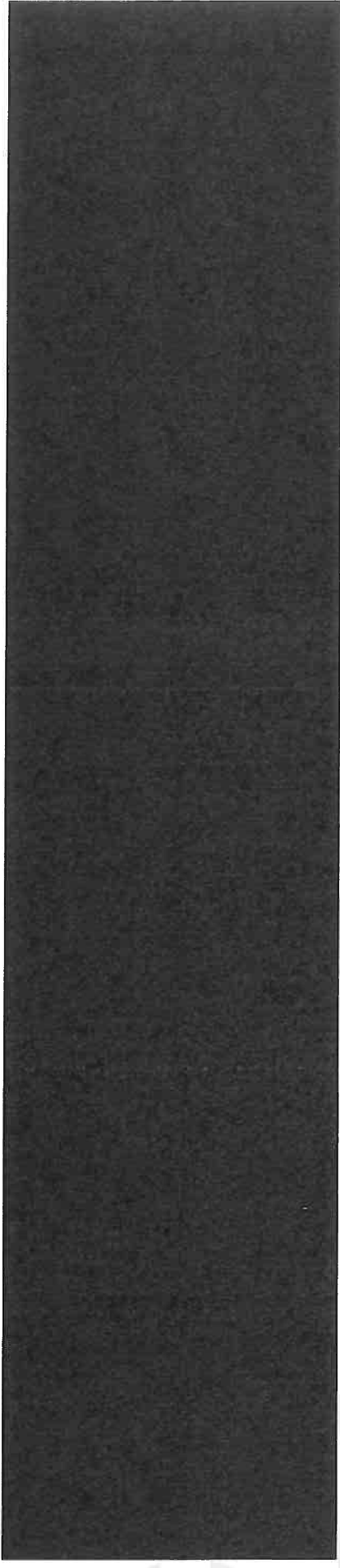


CABINET-IN-CONFIDENCE (after first entry)



Single Assessment Framework – Business Case Template (All Tiers)

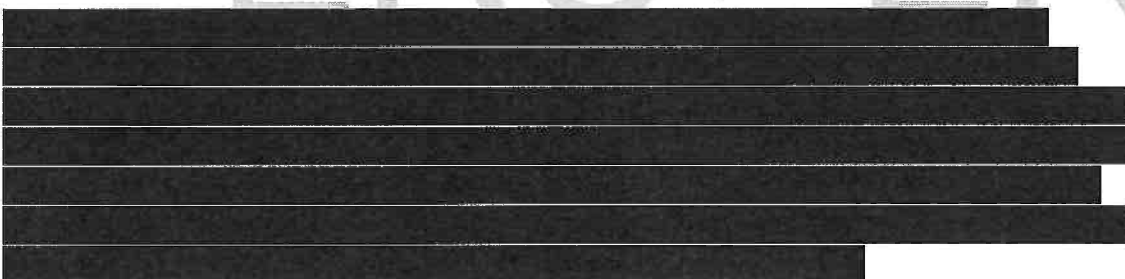
CABINET-IN-CONFIDENCE (after first entry)



6.1.1. Commentary on risk

The risk workshop considered potential future risks based on the current known information. There are a variety of mitigating measures that will be implemented prior to project contractual close to mitigate certain project risks as far as is practical. Identified mitigation / management measures are presented in the Risk Register. Much of the risk will be mitigated through further design development prior to financial close such as Front-End Engineering Design (FEED) activities, ground investigation and utilities connection studies. In addition, project risk will be mitigated through the contracting philosophy. As far as reasonably practicable, risk mitigation will be undertaken prior to contractual close, before significant capex is incurred. As is typical for any capital works project, some risks will have to continue to be managed through construction, and for such mitigation measures, associated project development cost has been included in the financial modelling.

Much of the risk under the shortlisted delivery models analysed later in this chapter are anticipated to be transferred to the chosen private sector developer / contractor. The mitigation measures set out in the risk register assume that the contractor would be willing to accept a level of risk that is in line with general market practice and therefore considered reasonable. Such risks are assumed to be priced into developer / contractor costs in the analysis in Section 7 of this document. The risk appetite of contractors may change over time as they undertake due diligence and investigations and therefore final risk positions are expected to be commercially agreed within the contracts during the project's procurement stage.



6.2 Commercial Principles

To select the most appropriate delivery model, the relative importance of a range of commercial principles has been considered. For the FOGO facility, the commercial principles underpinning the proposal that are important to consider include the following criteria:

- Time to deliver
- Flexibility
- Level of Integration / Bundled Services
- Level of risk transfer
- Innovation and incentive
- Output specification
- Cost and level of complexity for Government
- Price certainty

These commercial principles have been used in a Multi-Criteria Analysis that was the basis of selecting the preferred delivery model, as outlined later in this chapter. A description of each of these principles based on the *ACT Government Capital Framework, Draft Delivery Model Analysis Guidelines* is summarised in Table 35 below.

Table 35: Definition of key commercial principles

Commercial Principle	Description
Time to deliver	The extent of time required to prepare and procure the project, and commence operations.
Flexibility	Operational flexibility: the extent to which the delivery model enables the Government to retain flexibility in terms of the project's operational profile. Future scope changes: the extent to which the delivery model assists the Government in managing and implementing changes to the functional requirements of the project over time (both during the design and construction stage and subsequently).
Level of integration / Bundled services	The level of integration between construction, ongoing maintenance, and facilities management.
Level of risk transfer	The extent to which the delivery model facilitates a transfer or project risks from the Government to the private sector contractor.
Innovation and incentive	The existence of opportunities and incentives within the delivery model to drive innovation.
Output specification	The Project Team clearly understands the output requirements from the project and can readily measure outputs. The easier this is to define, the more suitable to complex, integrated models.
Cost and level of complexity for Government	Level of cost and complexity of the procurement process, both for the public sector and for bidders. Additionally, the costs to establish and maintain relationships between the parties and level of ongoing Government involvement.
Price certainty	The importance of price certainty to the project, associated with the project risk profile and need for flexibility.

The relative importance of each criteria and level of consideration when selecting the most appropriate delivery model is outlined in the table below. Note that this relative importance is quantified later in this chapter.

Table 36: Commercial Principles

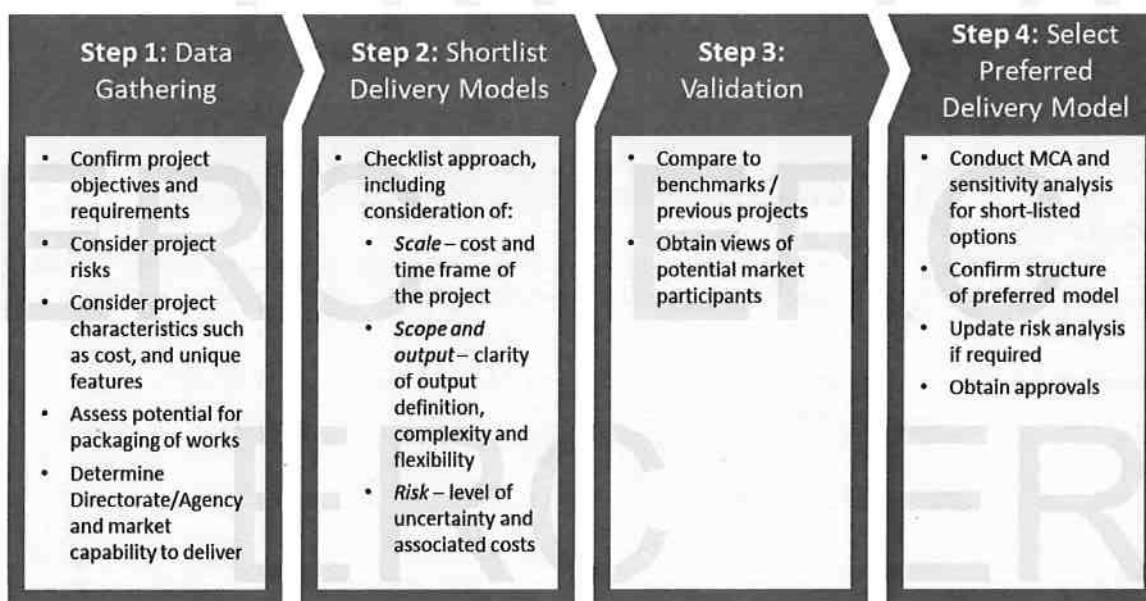
Criteria	Description
Time to deliver	Time to deliver the FOGO facility is relatively important due to Election Commitments and ACT's broader timelines to deliver the project in 2024, as well as the need to make progress against government's carbon reduction targets. Factors such as the technology and its potential obsolescence are not a driver or concern for this project.
Flexibility	Flexibility in the project and its delivery, in terms of ability to accommodate to variability and uncertainty is not the primary concern form this project. The facility's size, quantity of waste and the required output is expected to be understood prior to going to market.
Level of Integration / Bundled Services	Level of integration and the ability bundle services is important for this project. This will help to ensure that the facility is designed and built to accommodate optimised operational procedures and can generate a compost output of the quality required. This is consistent with feedback during informal market sounding, where private sector parties emphasised the importance of integrating asset creation and operating activities, and limited interest in post development operating contracts. Additionally, as the operator is intended to be responsible for creating the market for compost produced, there is incentive for the developer to construct a facility that is fit and useful over the asset life.
Level of risk transfer	[REDACTED] [REDACTED] [REDACTED]
Innovation and Incentive	The delivery model should encourage the private sector to be innovative, creating the opportunity for a better solution for organic waste processing. If allowed by their technologies or market relationships, bidders should be encouraged to demonstrate the ability to generate additional by-products that could be used to generate additional revenue streams and further develop the circular economy.

Criteria	Description
Output Specification	The Output Specification would be limited to stipulating compliance with relevant environmental standards and the required waste feedstock level being pre-defined. This lends to a model which would not require detailed designs to be provided to bidders, particularly as there are options for bidders to deliver this project using various technology solutions or uses for produced compost.
Procurement cost and level of complexity for Government	This project requires balancing the need to leverage private sector know-how, capacity, and innovation potential, with minimising unnecessarily complex contractual arrangements. [REDACTED] This commercial principle is considered to have a medium level of importance given the project is small in scale and therefore less complex.
Price certainty	Price certainty is important for this project and is sought for most government projects. Given constraints in the ACT's current and future budgets, price certainty is of high importance for this project.

6.3 Delivery Model Assessment

The Delivery Model Assessment has been undertaken using both the *ACT Government Capital Framework*, and *Delivery Model Analysis Guidelines*. This approach includes shortlisting delivery models, and subsequent detailed delivery model analysis using the Commercial Principles discussed in Section 6.2, based on the framework below set out in the guidelines.

Table 37: Delivery Model Selection Framework



6.3.1. Data Gathering

Significant work has been completed prior to the Business Case phase on Delivery Model Assessment and high-level market sounding. This has been highlighted throughout the business case document, summarised in the table below.

Table 38: Data Gathering

Data area	Key observations
Project objectives	See Section 2.1.1 for project objectives.
Project requirements	- Introduction of food and garden organic waste treatment for waste that is currently sent to landfill - Redirection of 50% of domestic organics from landfill - Treatment of over 42,000 tpa of feedstock by 2024 - Ability to engage and create a compost market for the sale of the output of the facility. Potential for additional revenue generating by-products
Project risks	Key project risks have been outlined within Section 6.1, with further detail provided in the Risk Management Plan included in Appendix E. [REDACTED] [REDACTED] [REDACTED]

Data area	Key observations
	[REDACTED]
	[REDACTED]
	[REDACTED]
	[REDACTED]
	[REDACTED]
Market Sounding - 2020	Soft Market Sounding was completed as part of the Feasibility Study with various established and reputable players in the FOGO market. Please see the section below for a summary of the findings of the market sounding.
Market Sounding to inform FOGO facility delivery model November-December 2021	The ACT undertook a market sounding in order to gain insights from the market before commencing the procurement process, specifically feedback on potential opportunities and constraints that should be considered in structuring the proposed procurement and associated delivery model. The market sounding process provided an opportunity for the market to input into the design of the project's commercial structure.

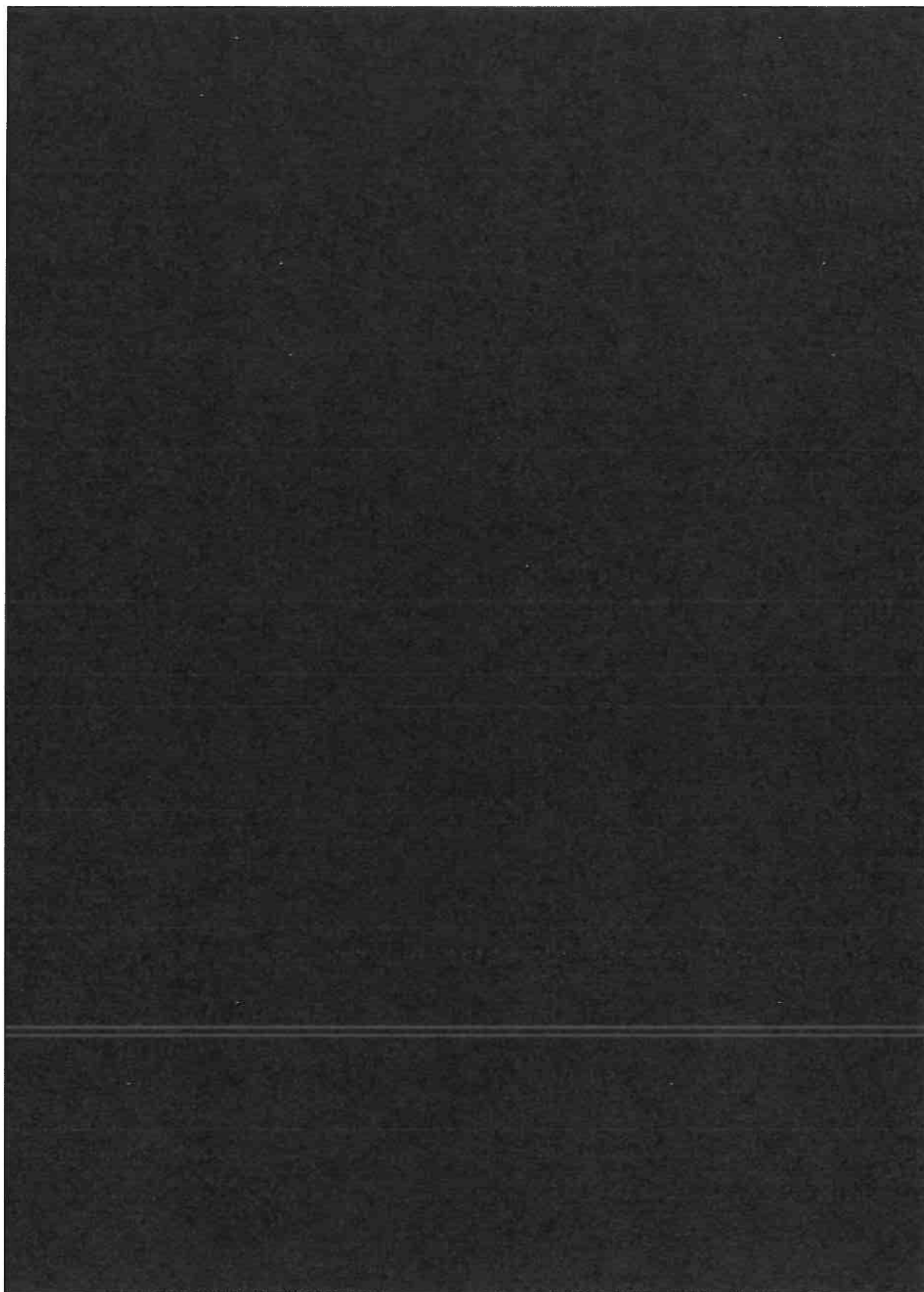
6.3.2. Market Soundings

Arup conducted a soft market sounding with various established and reputable players in the FOGO market. This included technology providers and facility operators with experience across a range of contractual models. Key findings have been anonymised to protect commercial-in-confidence information and are summarised in Table 39.

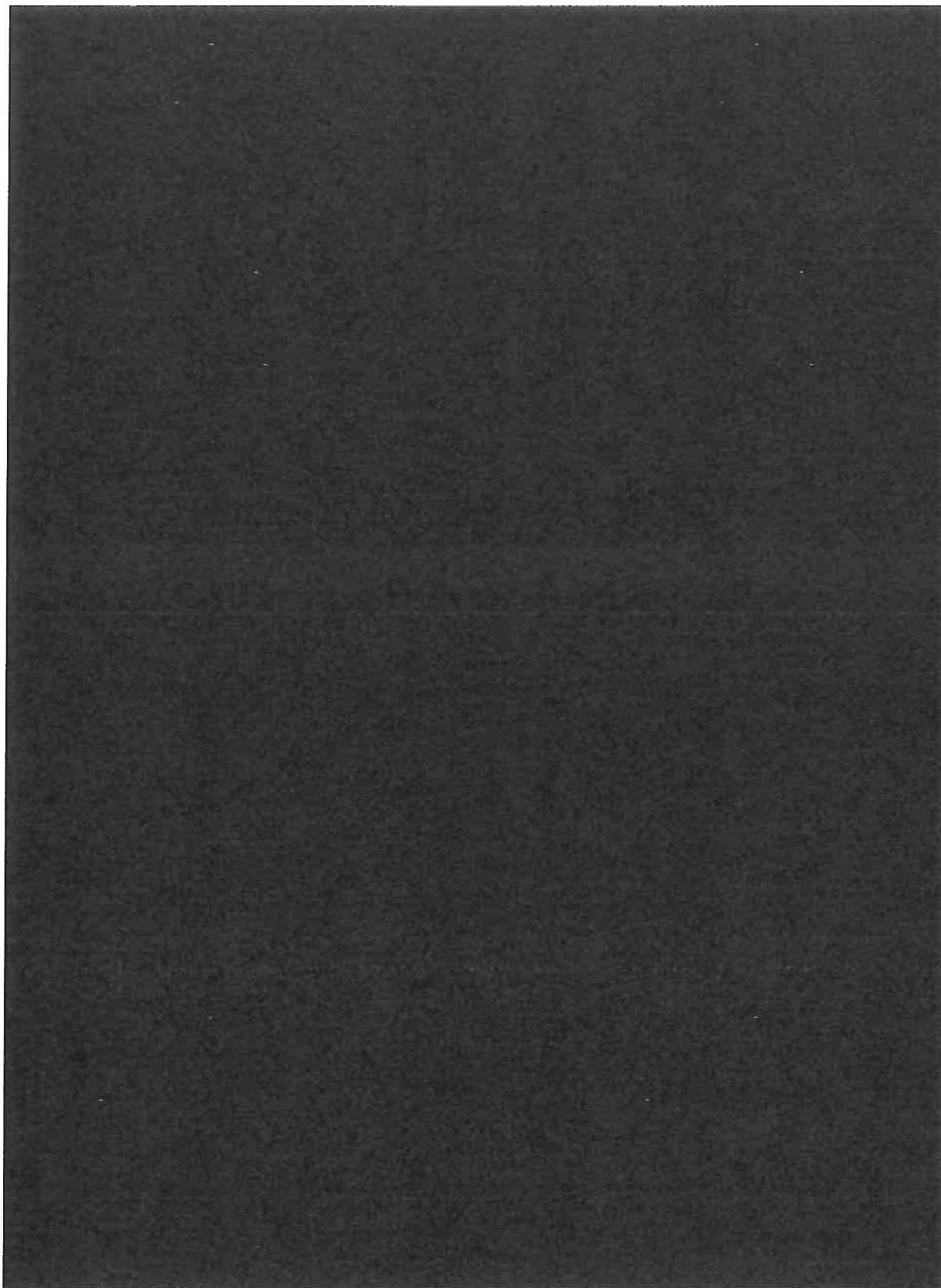
Table 39: Summary of soft market sounding findings

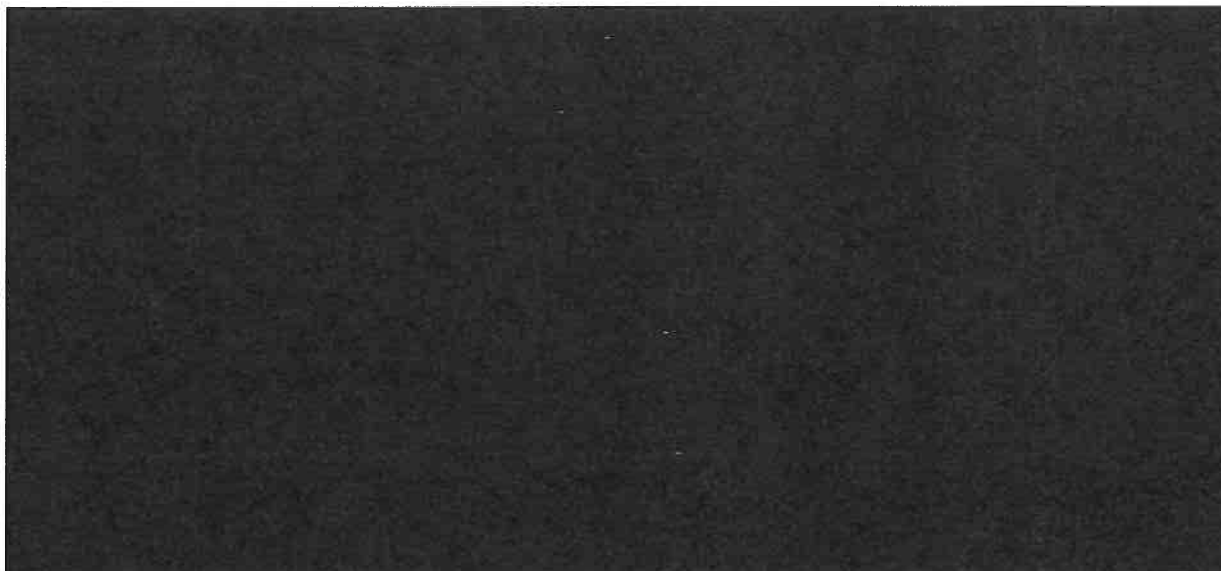
[REDACTED]

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model. Refer to Appendix K – Delivery Model Market Sounding Report for details on the market sounding process and findings.

6.3.3. Delivery Model Short-List

The long list of delivery models considered for delivery of the FOGO Facility are detailed in the Appendix J – Delivery Model Shortlisting. 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

Refer to Appendix J – Delivery Model Shortlisting for the results of the analysis and short-listing.

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.

Delivery Model	Benefits	Disadvantages
	to manage these risks. The DCMO substantially places these risks with the contractor, although some level of direct product procurement by the ACT may be appropriate. FOGO technology is well understood within the market and there is strong market appetite for delivery models which combine design and operations phases.	
User Charge PPP	- In addition to risk transfer as discussed for DCMO, decommissioning risks and costs can be transferred to private sector - Long-term arrangement with contractor - Asset creation and operating activities being linked can help ensure interfaces are well managed and the facility is operated optimally, incentivises for whole-of-life cost savings for maintenance and operations - Similar to DCMO, leverages private sector's ability to identify and/or create end markets for compost products - No upfront capital investment required by the ACT - FOGO technology is well understood within the market and there is strong market appetite for delivery models which combine design and operations phases.	- ACT has limited input into design, build and long-term operations once contractual arrangements are finalised with contractor - Limited ability to innovate or upgrade over the life of the plant - Generally, takes a long time to structure, document, negotiate, procure and reach financial close, given the involvement of a number of different parties. - Facility transfers to ACT at the end of the term (could be a benefit or a risk) - Cost of PPP may be higher due to a combination of higher bid costs resulting from additional due diligence to satisfy providers of private finance, additional project costs due to the use of private finance and the need to generate incremental returns required by providers of capital vs. the cost of capital for ACT Government (note, there is insufficient detail around incremental impact to risks or risk allocation at this time to more fully assess)

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.*

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- *Sign off should only occur if the IFCW office is confident that the delivery model selected is the most suitable to the project requirements and level of risk.*

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.*

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

This model is outlined in the diagram below.

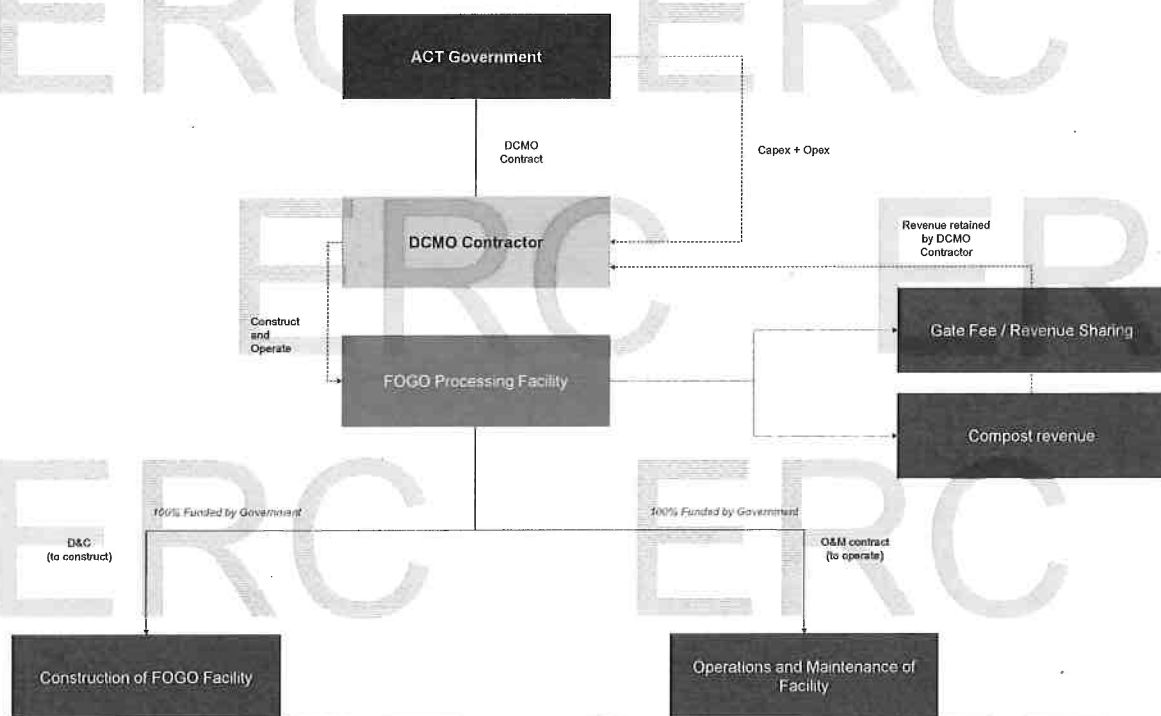


Figure 13: DCMO Proposed Structure

For the purposes of financial model, the model assumes that the DCMO contractor would be paid by the Government for upfront capital costs, inclusive of a [REDACTED] profit margin on construction activity. It would also be paid a revenue item (possibly structured as either a gate fee or availability payment) set at a level that would allow the contractor to generate an assumed contractor profit margin of [REDACTED] on operating expenses.

7.2 General Assumptions

The DCMO model assumes that capital costs, operating costs and major maintenance will be funded by the Government. In addition, the following assumptions have been applied:

- The DCMO contractor would be paid by the Government for capital costs, operating costs (net of any revenue derived from the sale of compost product(s)), and an assumed contractor profit margin of [REDACTED]. The assumed private sector profit margin in the financial analysis is based on Arup's observations of similar and recent projects in the Australian market.
- Under the DCMO, risks are allocated between government and the selected contractor. The analysis assumes this contract type will see the transfer of significant risks to the private sector in line with typical standard practice and this is articulated in the risk management plan in Appendix E.
- The Government would only fund capital and operating expenditures that align with the agreed allocation of risks and responsibilities. If a risk that is allocated to the contractor results in increased costs, the contractor would absorb any additional costs, either by

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 10%. 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 40 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.

Table 41: Systematic risk premium allocation table

Systematic Risk type	Weighting (Scale 1-5)- Based on relative importance	Estimated Portion of Systematic Risk Premium %	Allocation of risk based on Step 1 analysis (Scale 0 - 1)	Systematic Risk Premium Transferred to Private Sector
Demand				
Inflation				
Asset residual value				
Downturn in broader market				
Total				

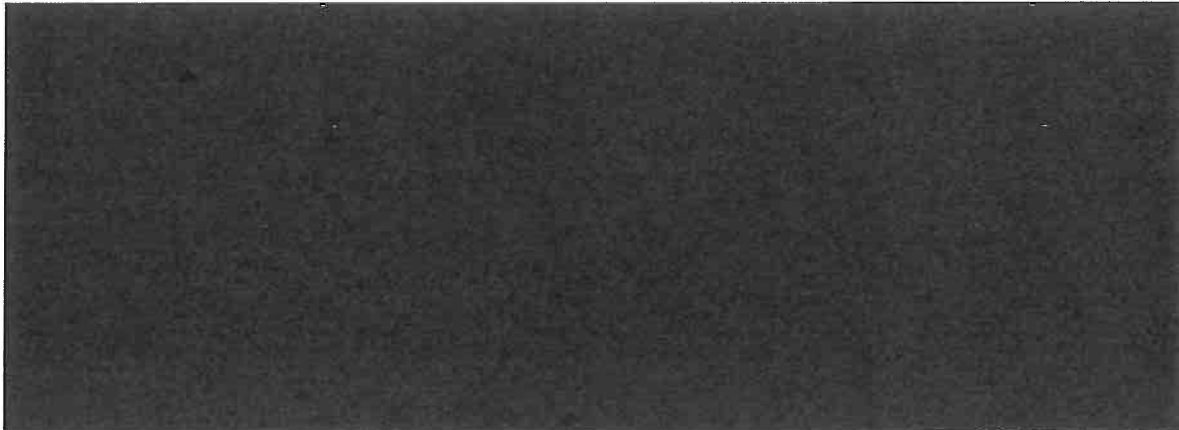
With consideration of the risk analysis undertaken in Section 6, the weighting and allocation of risk is based on the following reasoning:

- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]

The estimated portion of systemic risk premium in Table 42 is calculated by multiplying the portion of weighting in the Weighting column by the total systematic risk premium. The total systematic

premium is derived by multiplying the market risk premium with asset beta. The market risk premium is assumed at █% 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 43 and the average beta of █ was used in forming the total systematic risk premium. Therefore, the systematic risk premium as applied was █%.

Table 44: Comparable betas



As shown in Table 44, 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 (█%) and the 10yr ACT Government bond rate (█%), resulting in a discount rate to be applied to Government cash flows under the DCMO model of █%.

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 45: General model assumptions

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

Item	Parameter	Source
		<i>Bank of Australia, Forecast Table – February 2021</i>
Government discount rate	DCMO: █ % Traditional government procurement: █ %	Calculated in accordance with the <i>National PPP Guidelines Volume 5 Discount Rate Methodology</i>
Contractor profit margin	█	Based on benchmarking
Base CAPEX costs (excluding GST)	█ (real, FY21)	Refer to Section 4 for detailed assumptions and breakdown of development and construction capital costs
Base major maintenance costs (excluding GST)	Assumes one period of major maintenance in operational period in year 10. █ (real, FY21)	Refer to Section 4 for detailed assumptions
Base OPEX (excluding GST)	█ (real, FY21) aggregate across 20 years	Refer to Section 4 for detailed assumptions of variable and fixed operating costs
Risk adjustment on CAPEX	Risk adjustment of █ on CAPEX where █ of this risk is allocated to government under DCMO model.	Refer to Section 4 Error! Reference source not found. for methodology and detailed assumptions of determining risk adjustment.
Risk adjustment on OPEX for	Risk adjustment of █ on OPEX where █ of this risk is allocated to government under DCMO model.	Refer to Section 4 for methodology and detailed assumptions of determining risk adjustment.
Compost output revenue rate	█ per tonne (FY21, real)	Based on prices for various compost-based products in the urban landscaping market in Canberra.

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 █% (10-year ACT government bond rate), the net present value (NPV) of project cash flow is shown in Table 46. The cash flow in present value terms for the first full year of operations (FY2026) is summarised in Table 47.

Table 46: NPV Project cash flows

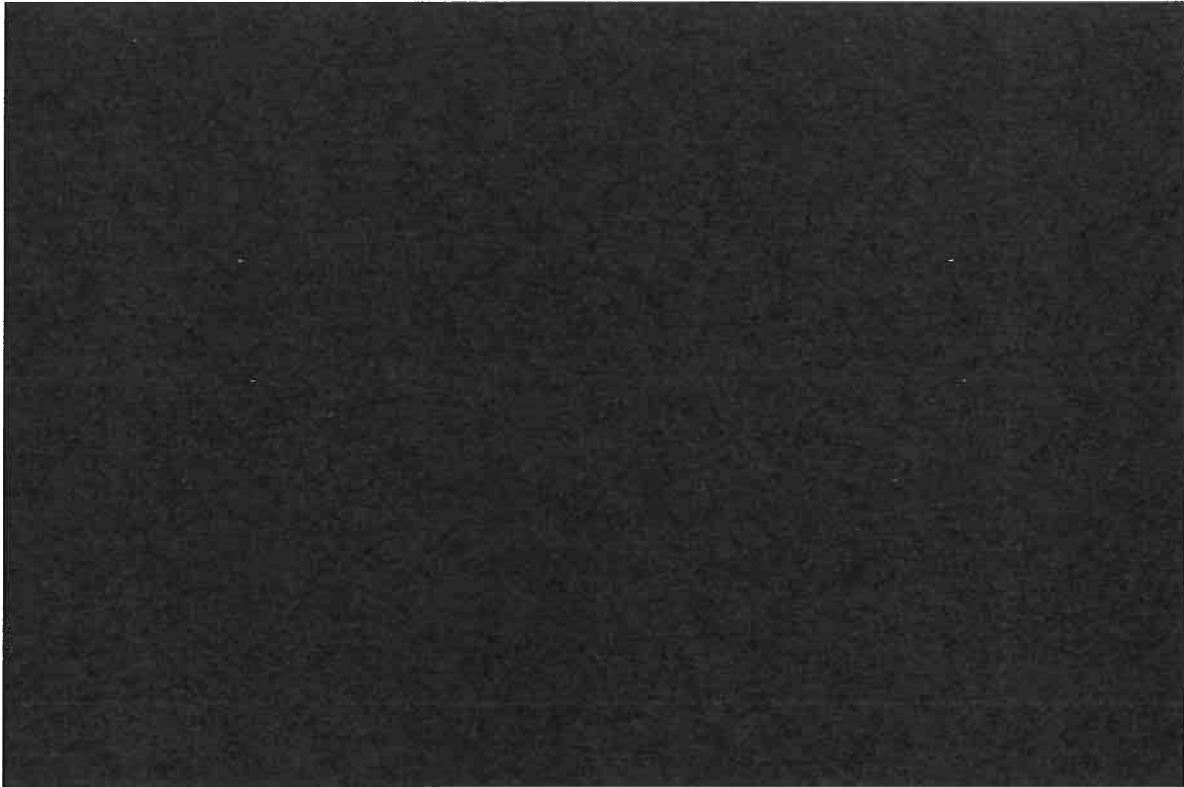
NPV Project cash flows	Value (\$, Discounted)
Capital Costs	
Development and construction CAPEX	█
Major maintenance CAPEX	█
Recurrent Costs	█
NPV	█

Table 47: NPV cash flow for first full year of operations

NPV Cash flows for first full year of operations FY 2026	Value (\$, Discounted)
NPV	█

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.

Table 48: Pre risk-adjusted nominal cash flows



To reflect the uncertainty associated with the project, sensitivities on selected key assumptions and inputs were undertaken. Sensitivity testing will allow the ACT NoWaste team to better understand how changes in key variables can influence analysis outcomes, and therefore parameters that may be of focus in evaluating bids during the procurement stage. The impact of each sensitivity test upon project cash flow outputs was modelled relative to the central case of others.

Table 49: Sensitivities on project cash flows

Sensitivity	NPV Project cash flows
Base case outcome	
Discount rate sensitivity 3%	
Discount rate sensitivity 5%	
Capital costs (excluding major maintenance) +40%	
Capital costs (excluding major maintenance) +20%	
Capital costs (excluding major maintenance) -20%	
Operating costs +20%	

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

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 50 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.

Table 50: Potential outlets for compost-based products

Urban amenity	Agriculture	Site remediation
<i>Limited volume</i>	<i>Higher volume sales</i>	<i>Potential for high volume, low value</i>
<i>Higher-price point for some products</i>	<i>Lower price point for some products</i>	
<i>Moderate to high quality</i>	<i>High quality</i>	<i>Low quality</i>
• 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 after major works • Rehabilitation of riparian zones and design of bioretention systems for storm-water management	• Dairy pasture • Orchards • Broadacre cropping • Viticulture	• Landform reinstatement and vegetation establishment • Erosion control • Daily cover at landfill sites (material with high physical contamination)

Table 51 illustrates a range of retail prices for urban amenity products from current suppliers in the Canberra region. All products contain a compost component, with varying blends of soils, manures and fertilisers, and varying levels of screening to adjust the texture and performance of the product. The variability in product types and pricing further increases when considering agricultural, horticultural or land remediation markets, but prices are not available for these markets and are likely to be negotiated directly with bulk customers.

Table 51: Advertised retail prices from major Canberra green waste composters and CRJO FOGO composting

Canberra green waste composters and CRJO FOGO composting.	Self-haul retail price \$/m ³	\$/tonne based on an approximate compost density of 0.4 tonnes/m ³
Snowy-Monaro Regional Council FOGO service A-grade compost	\$ 32	\$79
Bega Valley Shire Council FOGO compost	\$ 33	\$83
Corkhill Bros garden mix/vege mix	\$ 48	\$120

Canberra green waste composters and CRJO FOGO composting.	Self-haul retail price \$/m ³	\$/tonne based on an approximate compost density of 0.4 tonnes/m ³
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 51, 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.

7.4 PPP/DCMO Payment Stream

Whilst Section 6.4 has identified PPP and DCMO models as suitable, the impact to risk quantification under each model cannot be accurately captured at this preliminary stage of the project. Therefore, the financial analysis of private sector delivery focuses on a DCMO model. The DCMO risk adjustment (as discussed in Section 4.3 **Error! Reference source not found.** and shown in Table 45) is applied upon the base capital and operating costs, reflecting risks retained by the Government under DCMO.

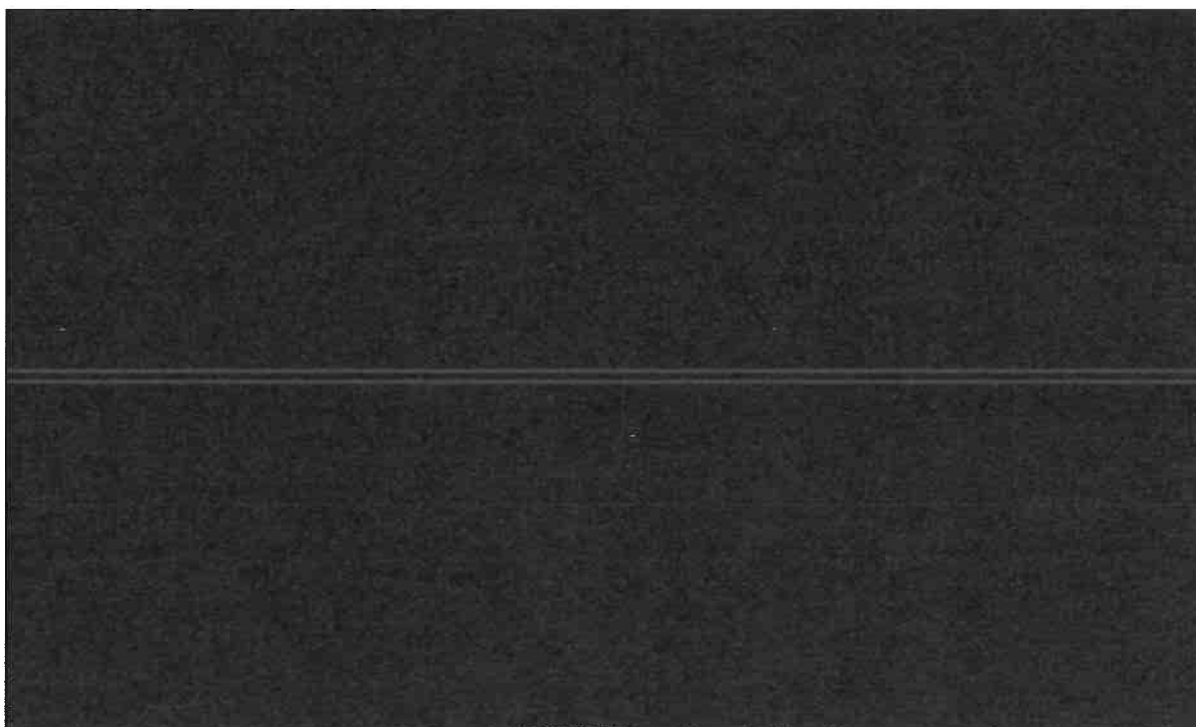
Under the DCMO model, the government pays the contractor a total amount that equates to capital costs, operating costs, and an assumed profit margin of █%. The risk-adjusted net present cost to the Government amounts to █, in which the capital costs to government in present value terms is \$█ and the risk-adjusted recurrent cost to government is \$█. Table 52 outlines the risk adjusted costs to government.

Table 52: Breakdown of net present costs to government under DCMO model

DCMO	Value (\$, Discounted)
Risk-adjusted capital costs to government	█
Risk-adjusted recurrent costs to government	█
Net present cost to government	█

The following graph shows the cashflow profile of the risk-adjusted net present cost to the Government from 2022 to 2044. Detailed cashflow is presented in Appendix I.

Figure 14: DCMO Risk-adjusted net present cost



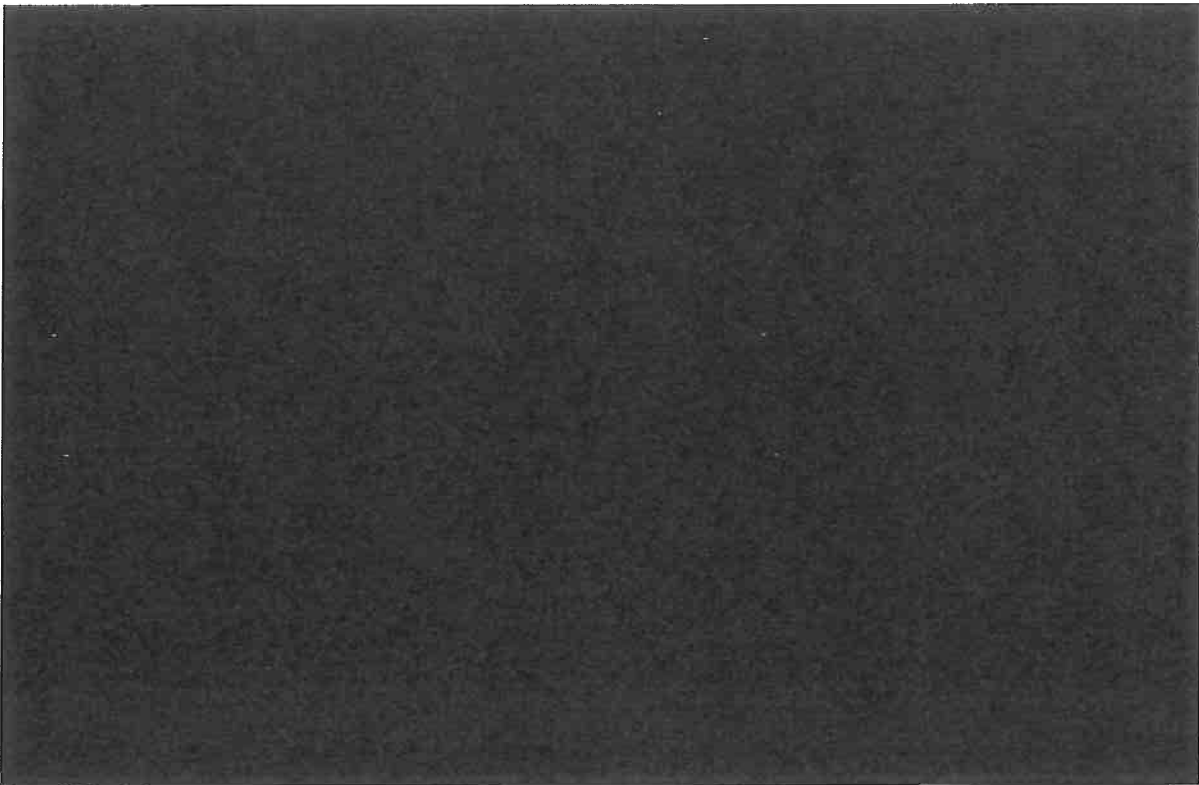


Figure 15: DCMO Nominal risk-adjusted cash flows

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 53: 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

The main objective of the analysis is to assess and quantify whether the transfer of delivery, operations and maintenance responsibilities to a contractor can create higher value to the Government. In undertaking analysis, a Public Sector Comparator (PSC) model has been designed to forecast the total costs associated with building and operating the facility through traditional government procurement. The PSC assumes that Government retains all project risk. This contrasts to the DCMO model where a proportion of risk would be transferred to the contractor.

The PSC consists of the following components:

- **Raw PSC capital and operating costs:** Breakdown of costs and underlying assumptions are detailed in Section 4.
- **Transferrable risk adjustment:** Represents potential risks that could be transferred to a contractor under a DCMO approach, however, it is being retained by the Government under traditional government delivery. [REDACTED]

Refer to Section Error! Reference source not found. for further discussions on risk allocation.

- **Retained risk adjustment:** Represents the value of risk that is not transferrable to the contractor. For example, force majeure risk or political risk. Refer to Section for further discussions on risk allocation.

The risk-adjusted NPC to the Government for both PSC and DCMO model are shown in Table 54. As discussed in Section 7.2, the PSC uses a discount rate of [REDACTED] % and DCMO uses [REDACTED] %. The risk-adjusted NPC cost to government for DCMO is [REDACTED] lower than if the project is delivered via traditional procurement.

Table 54: Risk-adjusted NPC to the Government

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

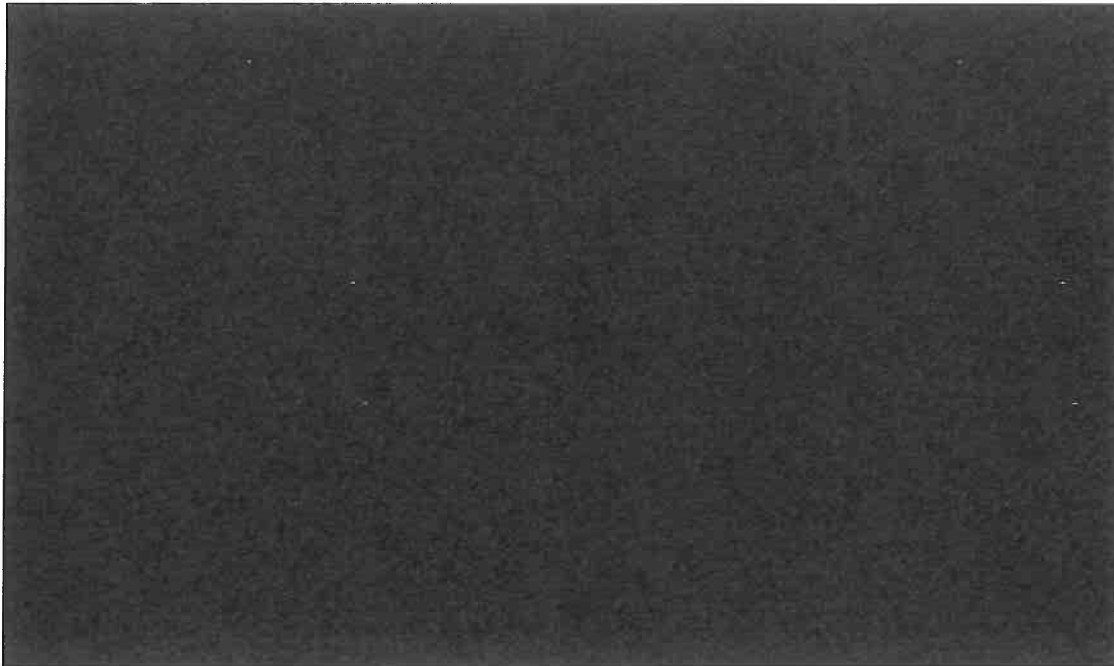


Figure 16: Financial Analysis

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.*

8. Project Governance

Proper control and coordination of key stakeholders and activities can help to achieve the clearly defined objectives of the proposed FOGO Facility, and ensure sufficient levels of transparency and accountability. By understanding key stakeholders and their guiding principles, the ACT Government can begin to develop a framework that can help facilitate the desired outcomes of the facility.

8.1 Key Stakeholders / Governance Groups

While the exact composition is unclear, there is a preliminary understanding of the likely actors who may have a role in the governance of the FOGO Facility. The preliminary assessment of the stakeholders is defined in Table 55 below.

Table 55: Key Stakeholders, Interests and Role

Stakeholder	Interest and Role	
Minister	Overall government sponsor for the project.	<i>Chris Steel MLA</i> Minister for Recycling and Waste Reduction / Transport
Steering Committee		
Project Sponsor (Chair)	Typically, the senior responsible person in the Requesting Directorate. Undertakes the role of Chair of the Steering Committee and is responsible for briefing the Minister on the progress of the FOGO Facility. Responsible for: - The role of Chair of the Steering Committee - Responsible for briefing the Minister on the progress of the project	Executive Branch Manager ACT NoWaste, TCCS Executive Group Manager, TCCS Executive Branch Manager, Infrastructure Delivery, TCCS Executive Branch Manager, Civil Infrastructure Branch, Major Projects Canberra
Treasury	Senior responsible person / decision maker Treasury. Responsible for:	Executive Branch Manager, Infrastructure Finance & Reform Division - Treasury

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

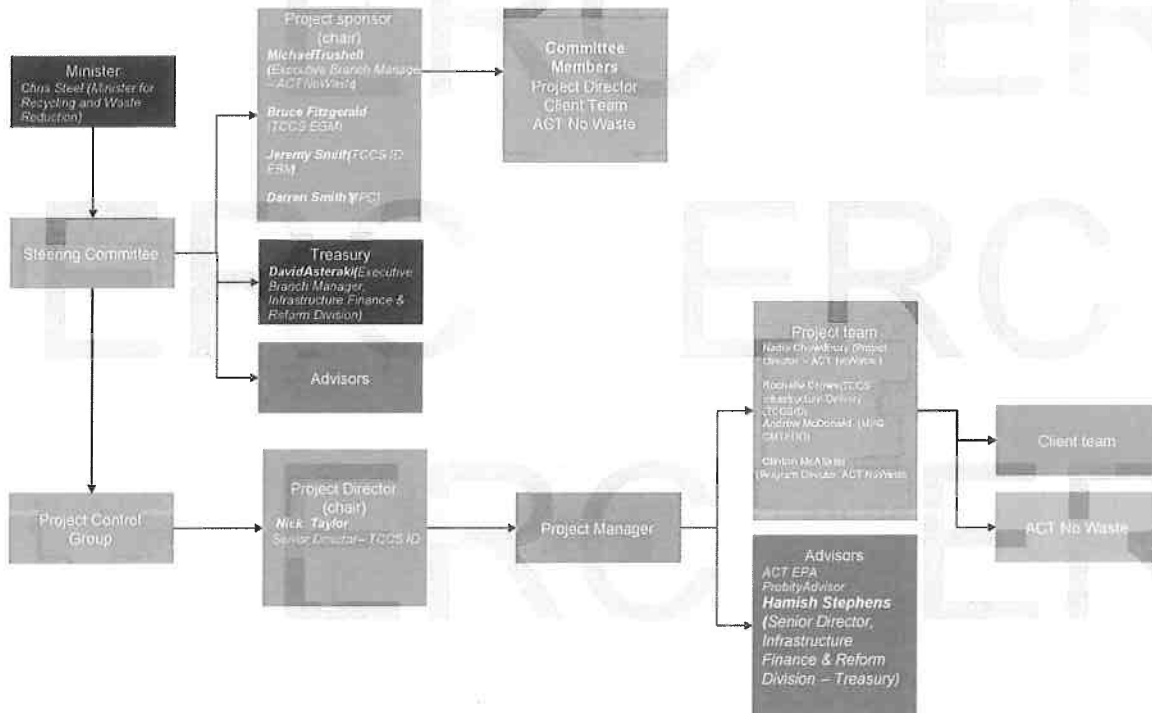
Stakeholder	Interest and Role	
Project Director (Chair)	Typically, from the Requesting Directorate. The PD has a highly developed project management and commercial skills and knowledge of government processes. Responsible for: • Day to day management of the project. • Management of the project team & advisors. • Provide periodical progress updates to the Steering Committee/ Project Sponsor. • Ensure project objectives are being met. • Overall responsibility for financial management & reporting. • Overall responsibility for contracts management. • Overall responsibility for time/schedule management	Senior Director, Infrastructure Delivery, TCCS
Relevant Advisors	Engaged on an as required basis. Provide specialised/technical input to the PCG where required.	ACT EPA Senior Director, Infrastructure Finance & Reform Division - Treasury
Probity Advisor	Should be engaged where required during the project. Observe and review the competitive bid process and establish whether the procedures have been administered fairly and impartially to all parties.	External Legal Services and GSO Probity Advisor – To be confirmed

8.2 Governance Framework

Based on the current understanding, a high-level overview of the proposed Governance Framework has been developed. The framework has also been informed by the *ACT Business Case Guideline* that sees the importance of consultation and communication.

The proposed governance framework is presented in Figure 17.

Figure 17: FOGO Governance Structure



9. Stakeholder Engagement Plan

9.1 Stakeholder Identification

Consultation during the Feasibility, EIS Scoping and Business Case stages of the project was limited to key stakeholders whose input was required to inform into the project planning and design. Targeted stakeholder engagement will proceed in the future phases of the project's planning and delivery. Key government stakeholders have participated in critical workshops, received regular updates and provided reviews of project deliverables. A stakeholder register has been developed that includes the Stakeholder Engagement Plan.

Key Stakeholders for the project include:

- Territory Departments
 - ACT NoWaste
 - ACT Treasury
 - Major Projects Canberra
 - EPSDD
- Potential bidders
- Local Community
- Adjacent Tenant
- Special interest groups
- Collections contractor(s)
- Indigenous communities
- Procurement ACT

9.2 Stakeholder Involvement & Interest

The following table outlines the identified stakeholder groups, their impact / interest in the project and the consultation done to date, as well as that planned for the future. Additional detail on stakeholder engagement and specific communication is included in the Stakeholder Engagement Plan in Appendix F.

Table 56: 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
	other directorates. They typically are designated projects that have significant complexity and scale.		
Environmental Planning and Sustainable Development Directorate (EPSDD) –	Department of Planning and Approvals. They are responsible for the statutory planning framework for planning in the ACT, which aims to deliver independent, long-term planning to benefit Canberra's residents. They are responsible for overseeing the development of the EIS statement and compliance with EPA Standards.	Informal consultation to determine the correct approvals pathway (Impact track, EIS required) and information requirements for EPSDD to assess the FOGO processing proposal. EIS Scoping process, with the EIS Scoping Report formally submitted in early March 2021 and published on the EPSDD website in April 2021.	Development and submission of the detailed EIS. A Brief and Statement of Requirements will need to be developed to allow the EIS process to progress. Respondents to the Tender process will be urged to submit concept to design documentation as soon as practicable to allow the design and all the facility requirements to be submitted as part of this EIS progression. A Consultant will need to be engaged through an open Tender process asap to meet the EPSDD timelines and coordinate all requirements in conjunction with ACT NoWaste, EPSDD and the successful Tenderer for the FOGO Facility Design, Construction and operational services

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
	advocates such as current composting groups or environmental lobbyists who will be impacted by the facility.		
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	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 of 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. Once a preferred tenderer has been identified, more detailed aspects of

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.

Stakeholder	Impact and interest on the project	Consultation to date	Planned consultation
	Major Project Canberra supports the delivery of larger or higher risk projects. MPC has been confirmed as the agency for the FOGO procurement process.		

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 advisors 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.

10.1.5. Other Specialists

Based on consultation with EPSDD it is confirmed that an environmental impact statement (EIS) will be required for development of a FOGO processing facility anywhere in the ACT. This process has commenced for the preferred site, and an EIS scoping report has already been prepared.

Arup is completing the EIS Scoping Process in conjunction with the Conservator's Office. A concept design will need to be prepared by Consultant alongside the EIS in order to inform the Assessment. This will be used as a base for the EIS and refined as required during the detailed design

10.1.6. Stakeholder Management and Communication

Stakeholder Management and Consultation will be undertaken by both Arup and ACT NoWaste as per the Stakeholder Engagement Plan. Additionally, Education for residents will be required to roll-out the FOGO facility and this will be led by the ACT NoWaste Education Partnership Team.

10.1.7. Project Management

Major Projects Canberra is likely to have some involvement in the in the project management and delivery of the FOGO facility. IPD, which is a part of MPC will manage the procurement process on behalf of TCCS.

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 57: Project Timeline (DCMO)

Stage	Key Activities	Timeframe	Notes
Business Case Finalisation	Business Case Finalisation	Q2 2021 – Q4 2021 (9 months)	
	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		
Procurement Process	Engage Legal Advisors	Q1 2022 – Q1 2023 (13 months)	
	Preparing RFP request and evaluation criteria		
	RFP application preparation time for bidders(s)		
	RFP Response Period		

	Evaluate and shortlisting valuation period for RFP Submissions Preparing RFT (including contractual documents) request and evaluation criteria RFT Response Period Evaluation period for RFT Responses Selection of Preferred Bidder		
Procurement Finalisation	Additional internal review of Selected Bid Negotiating, completing and concluding Project Documents Final approval of Selected Bid Contract Signing	Q1 2023 (2 months)	This requires for contracts to be negotiated and completed within 2 months. This is particularly tight.
EIS and Concept Design	Approved Scoping Document received from EPSDD and published online Preparation of reverse brief for EIS and Concept Design Tender process and appointment of Consultant Preparation of Concept Design EIS Background studies (NB Cultural Heritage, AQ / Odour)	Q1 2022– Q3 2023 (18 months)	In order to meet the 2024 project completion date, approvals must be run in parallel with both contractual negotiations and detailed design.

	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.

- A 6-month period for design is appropriate, however, the capacity of the successful tenderer to deliver the design within this period should be key criteria in the tender assessment process.
- Construction and commissioning will require early procurement of key plant and equipment.

11.1.3. Project constraints and/or deadlines

The key project constraints will be around ensuring the project receives appropriate funding, and the procurement process, particularly selecting the preferred bidder.

Key deadlines for the business case and approval process are summarised in the table below.

Table 58: Project deadlines

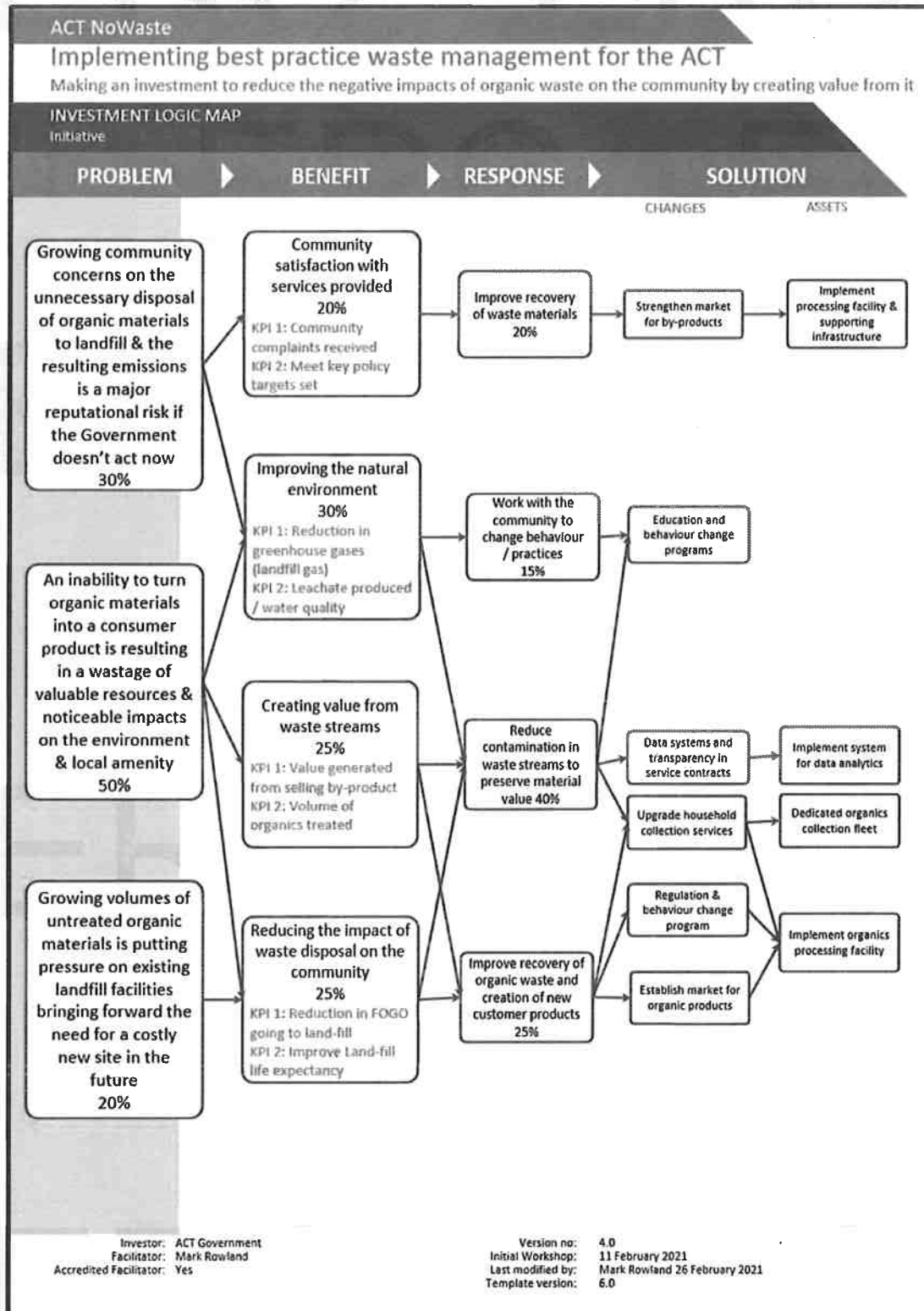
Task	Deadline
Cabinet Review Process	17 January 2022
Approvals - Budget estimates, including allocation for FOGO procurement	24 March 2022

12. Appendices

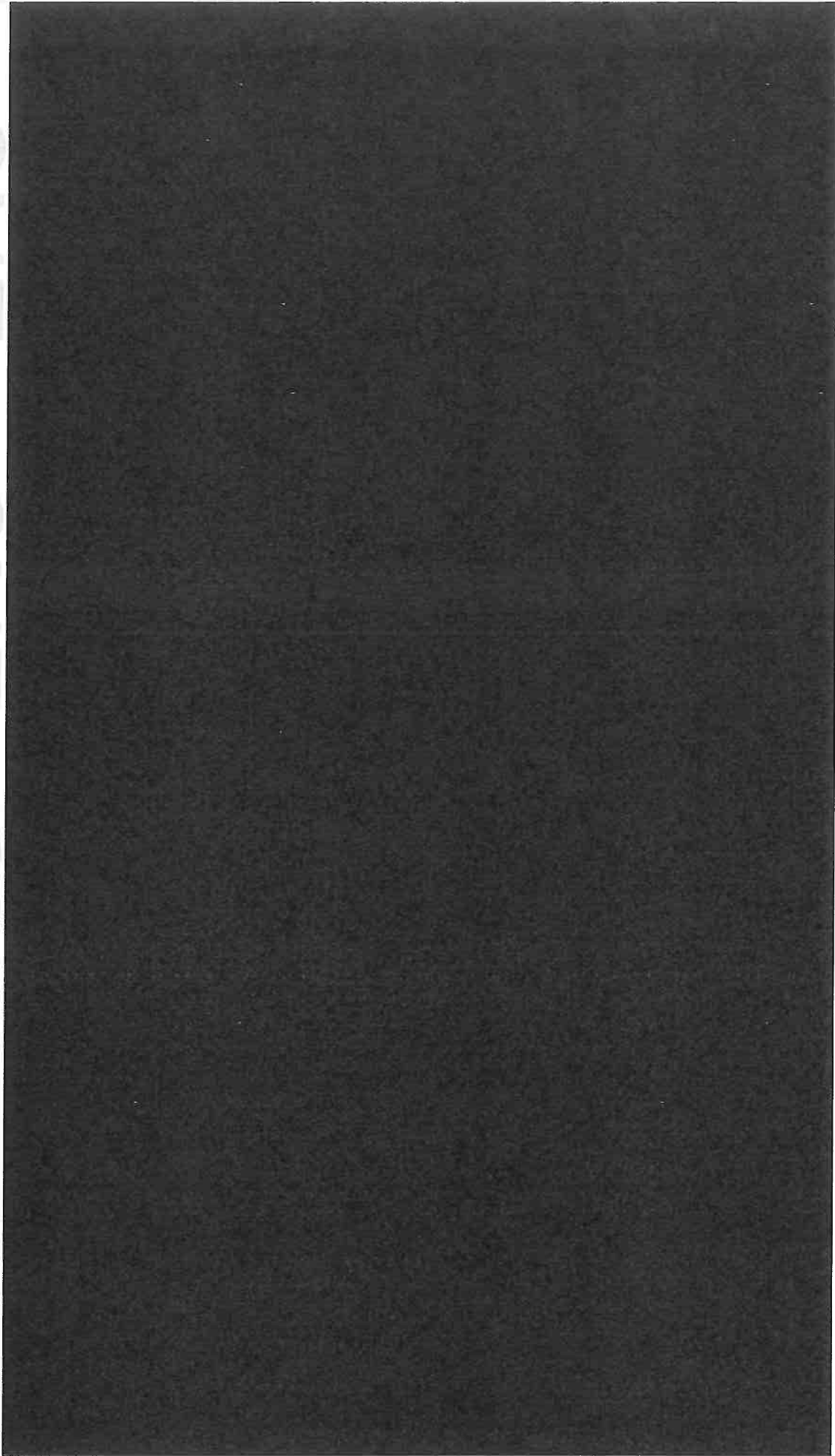
12.1 Appendix A – Functional Brief / Output Specification

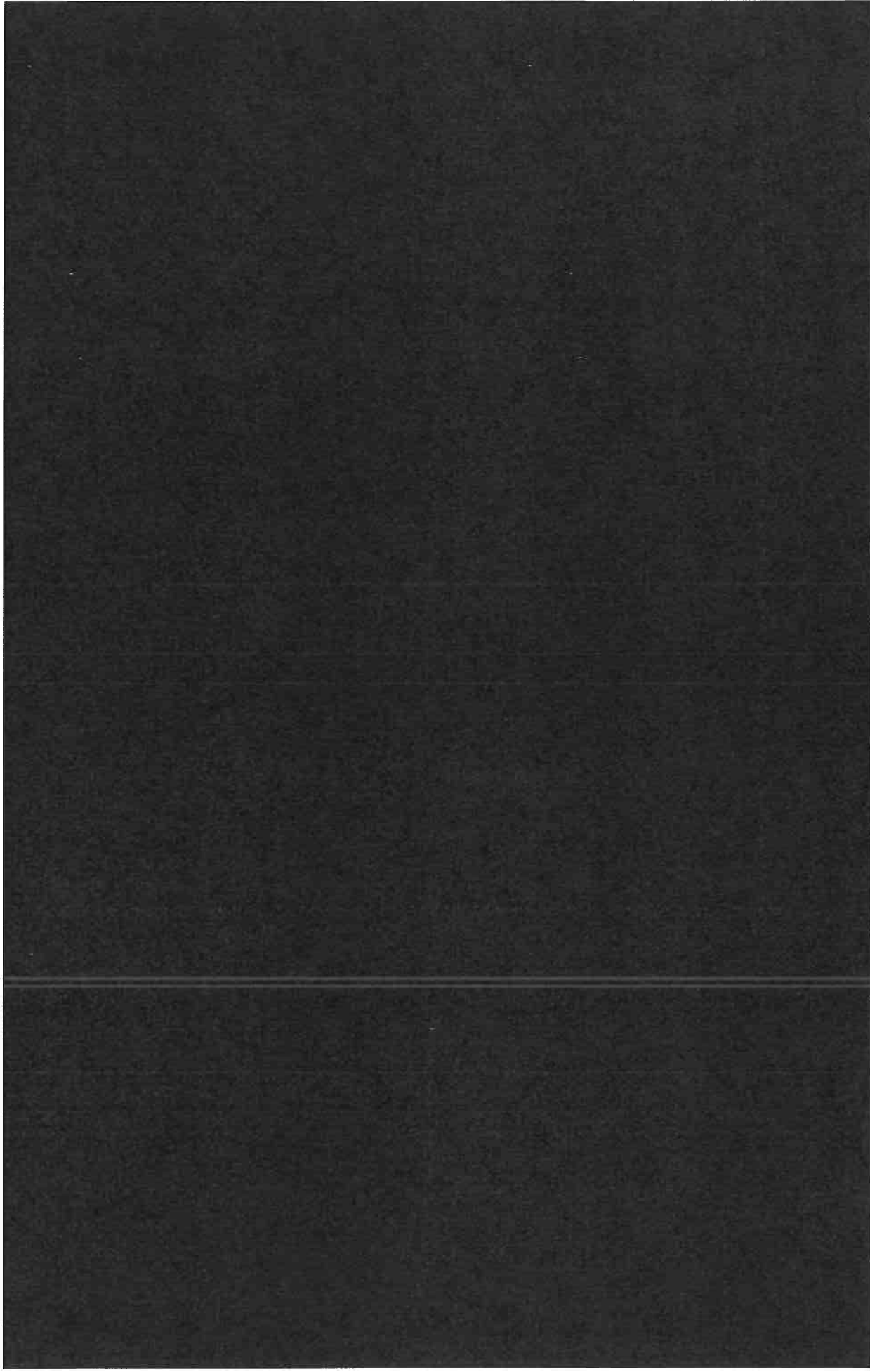
The Functional Brief/Output Specification is to be provided by Major Projects Canberra as part of the Procurement Strategy. This will summarise the needs and outcomes that ACT NoWaste is seeking to achieve from the project to assist in the achieving successful outcomes.

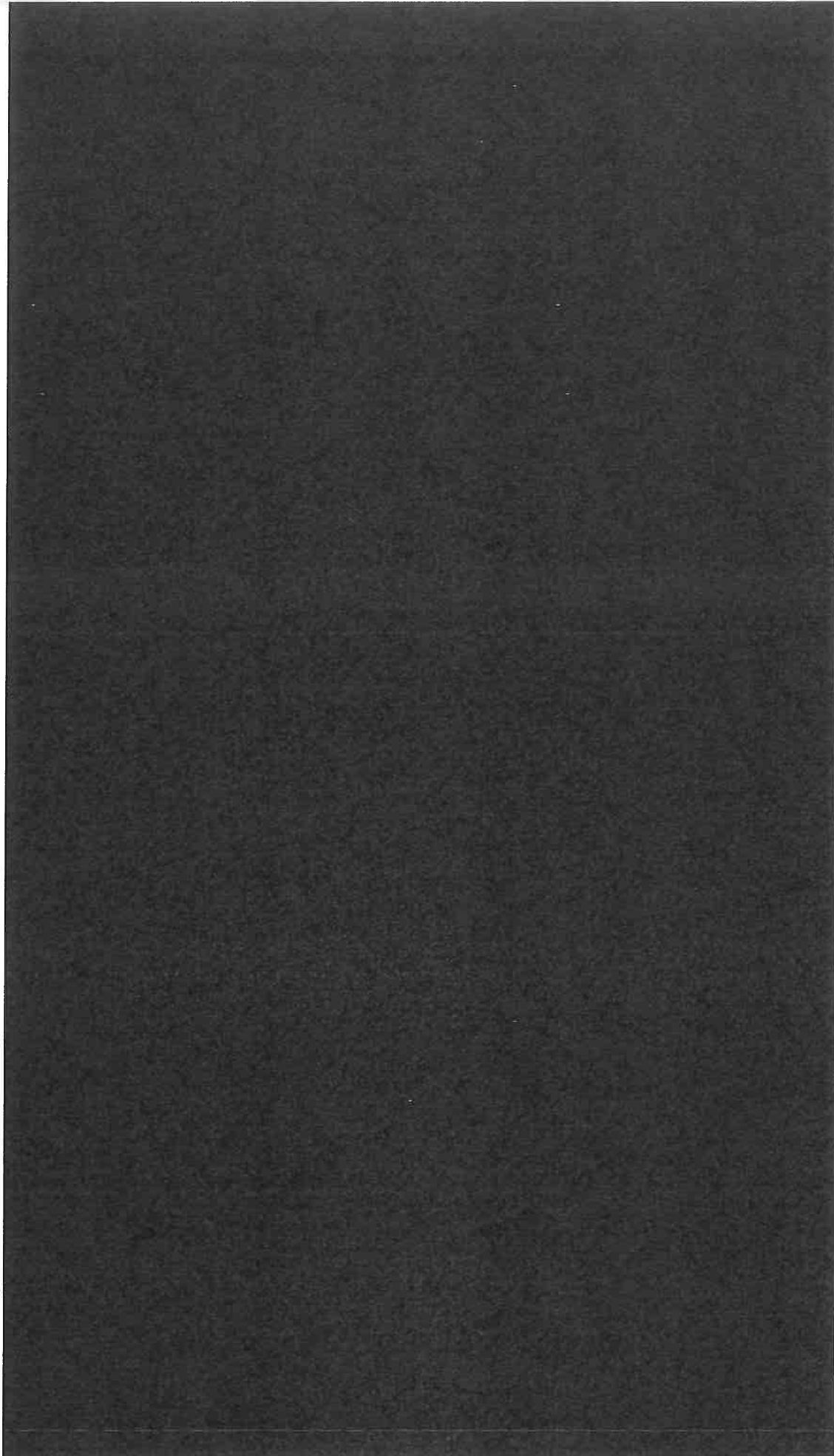
12.2 Appendix B – Investment Logic Map

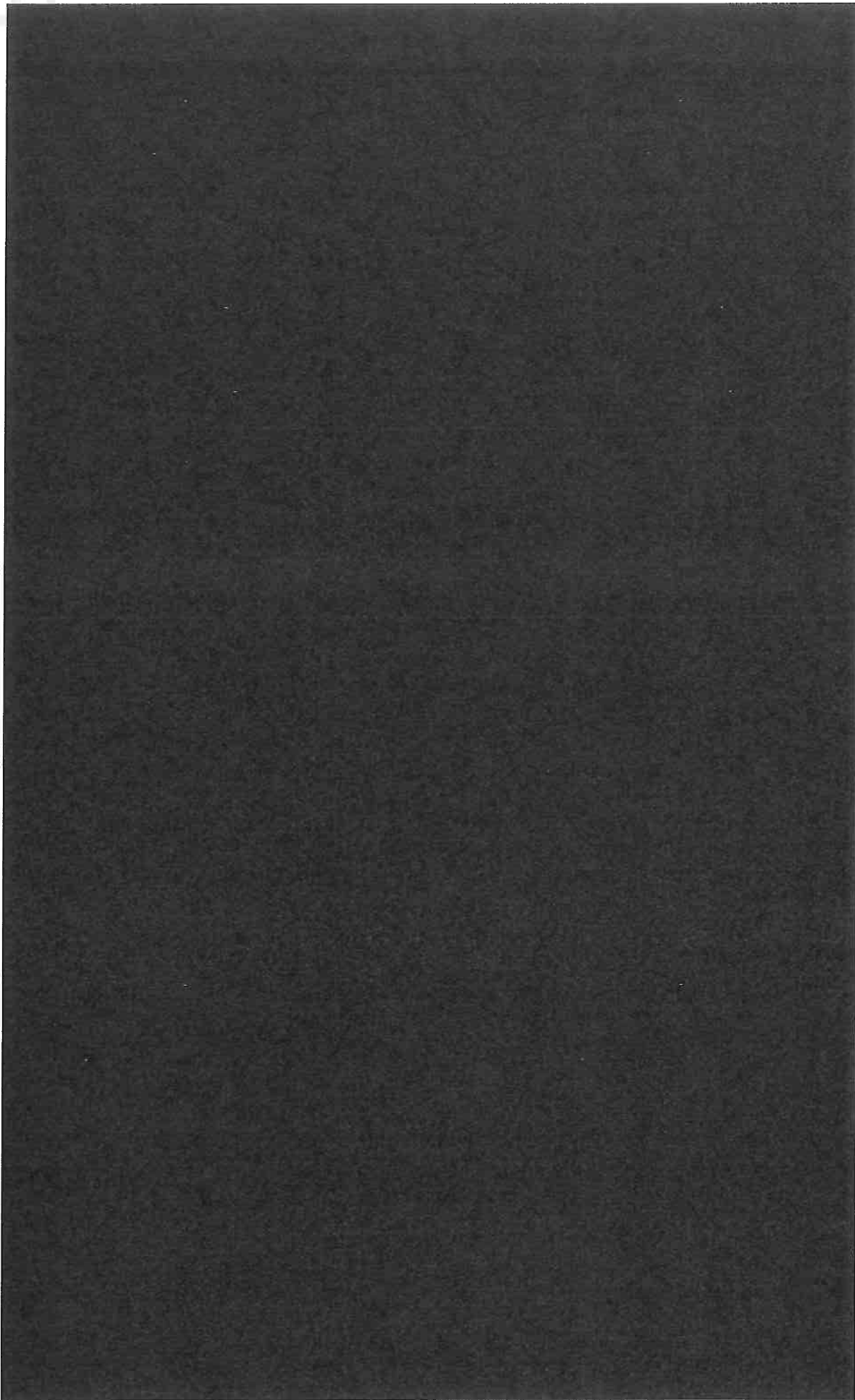


12.3 Appendix C – Risk Register







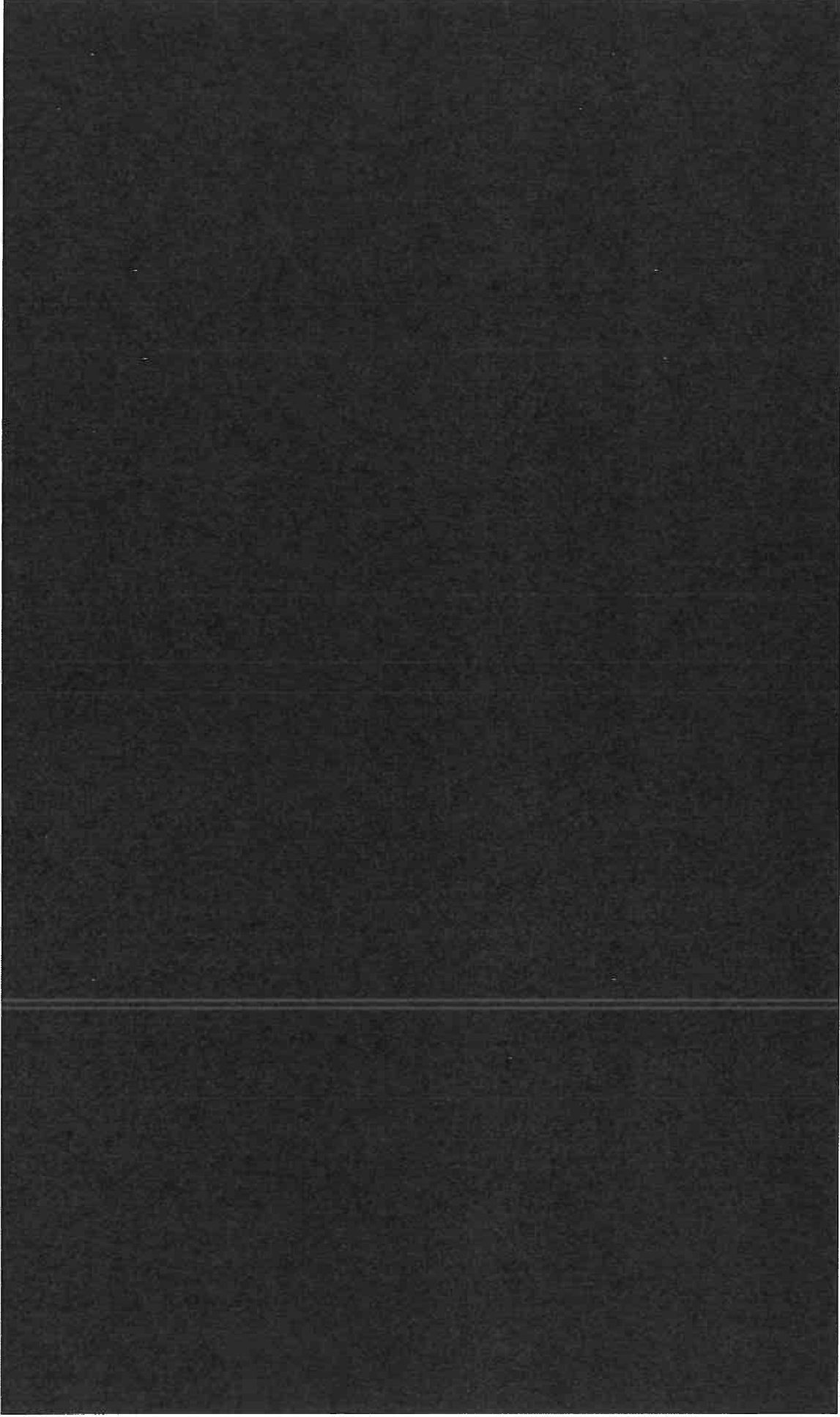


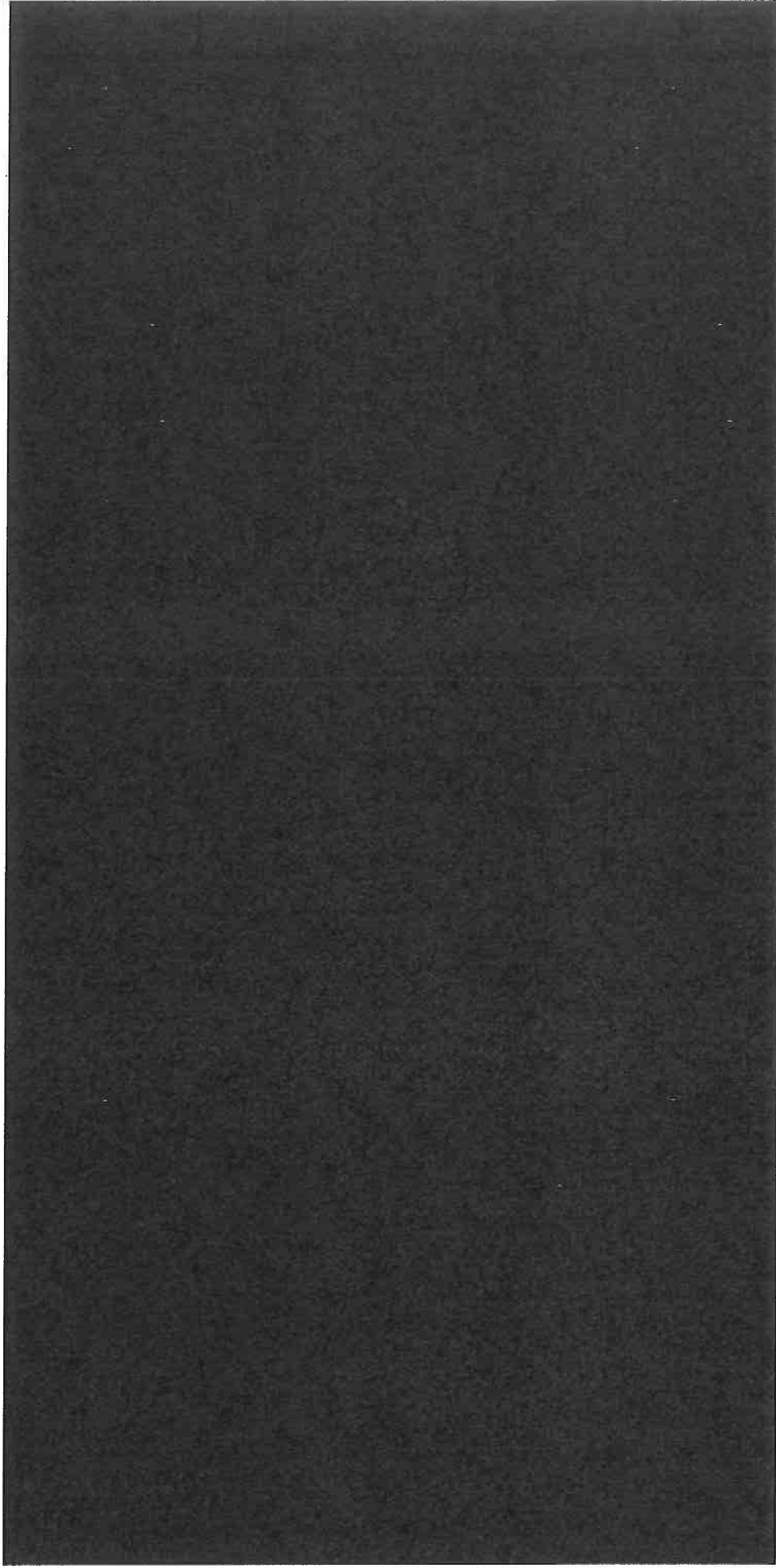


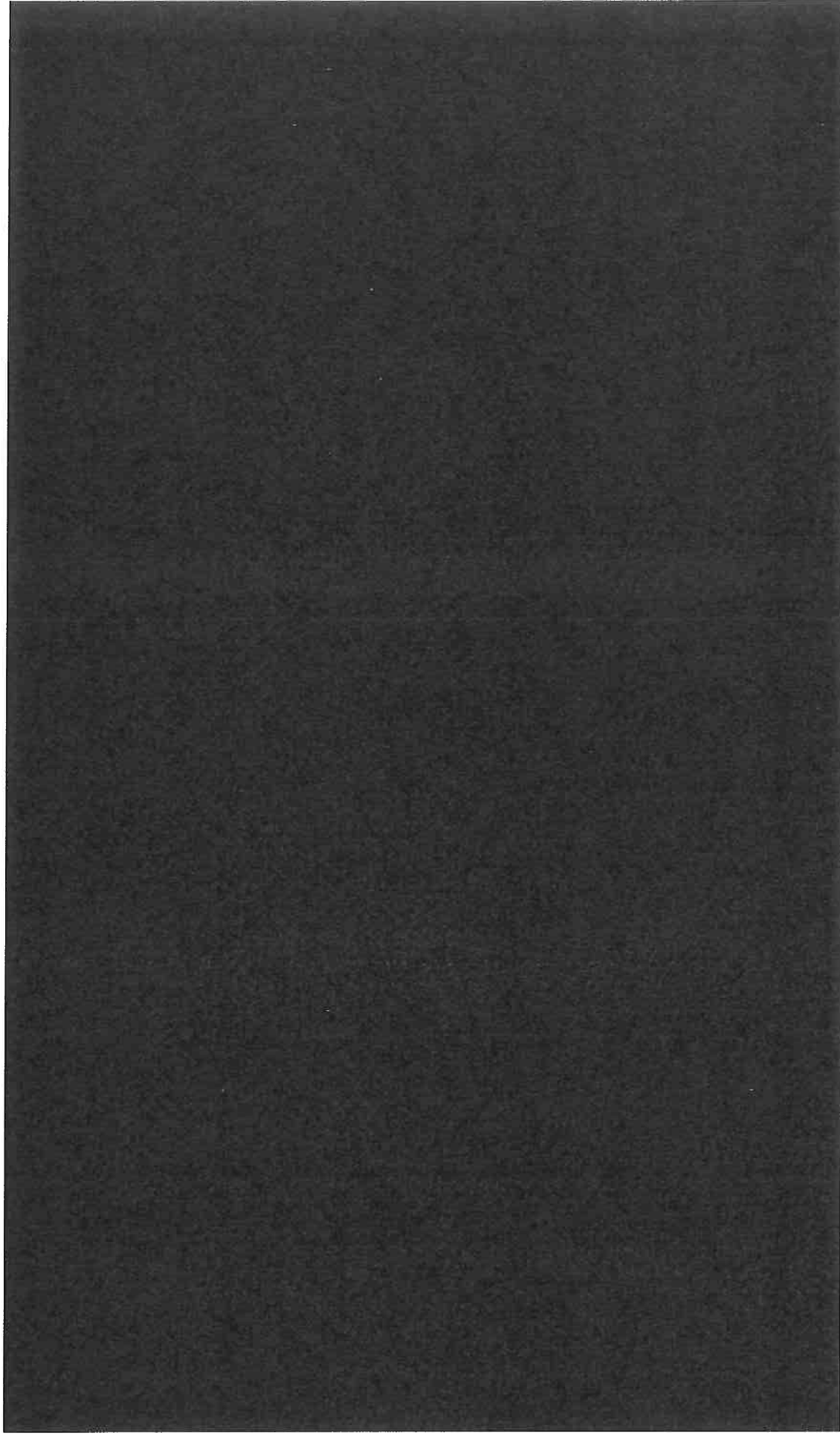
12.4 Appendix D – Project Programme

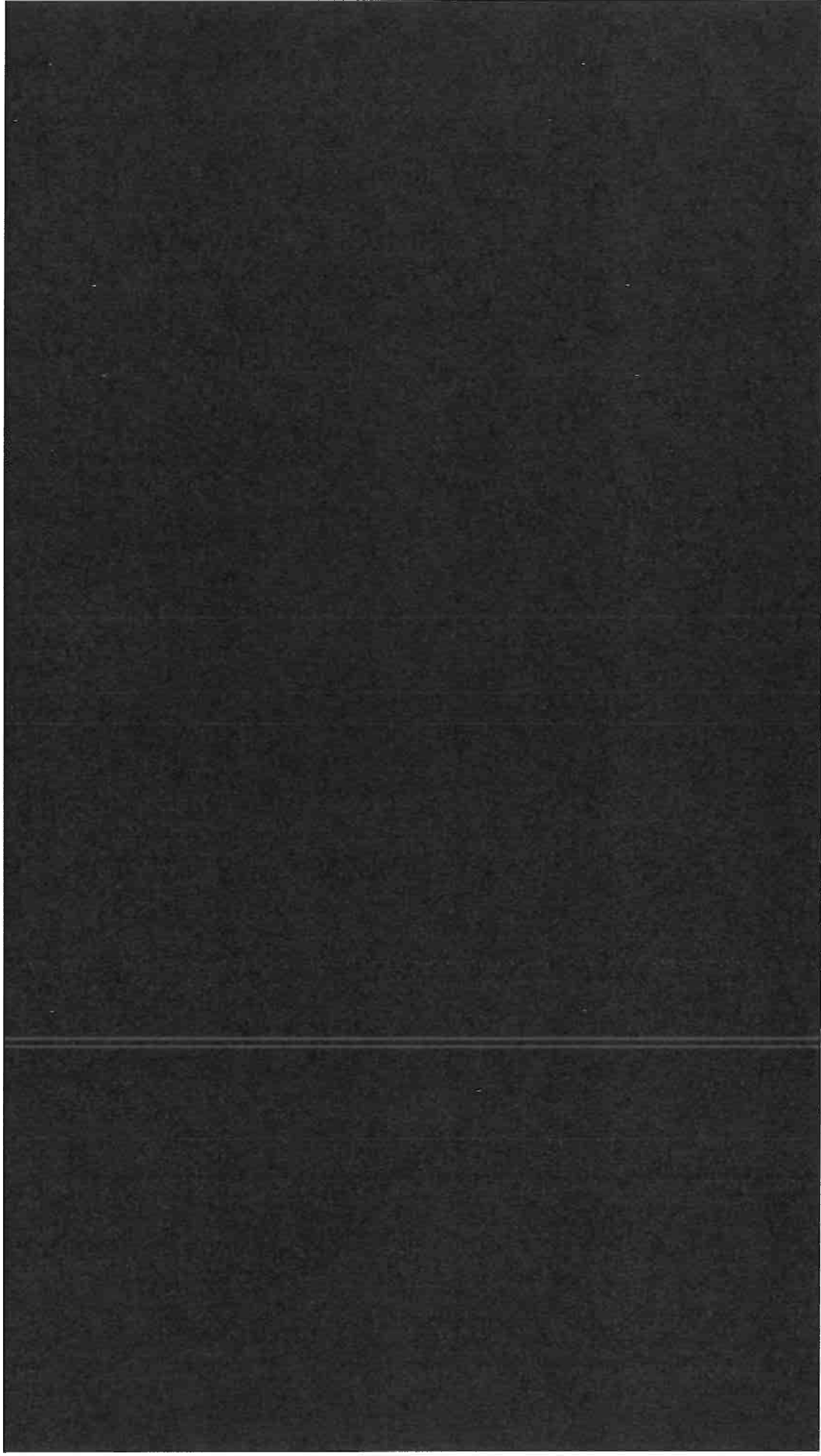
Procurement Process	2021												2022												2023												2024											
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec						
Project Lead Adverts																																																
Preparing BIF requests and evaluation criteria																																																
BIF Response Period																																																
Evaluate and shortlisting selection period for BIF submissions																																																
Issue BIF (including confidential documents) request and evaluation criteria																																																
BIF Response Period																																																
Evaluation period for BIF Responses																																																
Selection of Preferred Bidder																																																
Finalisation																																																
Further evaluation of selected Bid																																																
Negotiating, completing and concluding Project Documents																																																
Final approval of Selected Bid																																																
Contract Signing																																																
EO and Concept Design																																																
Tender process and appointment of Consultant																																																
Preparation of Concept Design																																																
ES Background studies (MS Cultural Heritage, ACO/CHS)																																																
ES Preparation and Submission to ES/DO																																																
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Submission of Applications to ES/DO																																																
Design (for selected Bidder)																																																
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Approvals (Planning, Environmental etc)																																																
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Testing, commissioning and handover																																																
Community Education																																																
Community Education Prior to Operations																																																

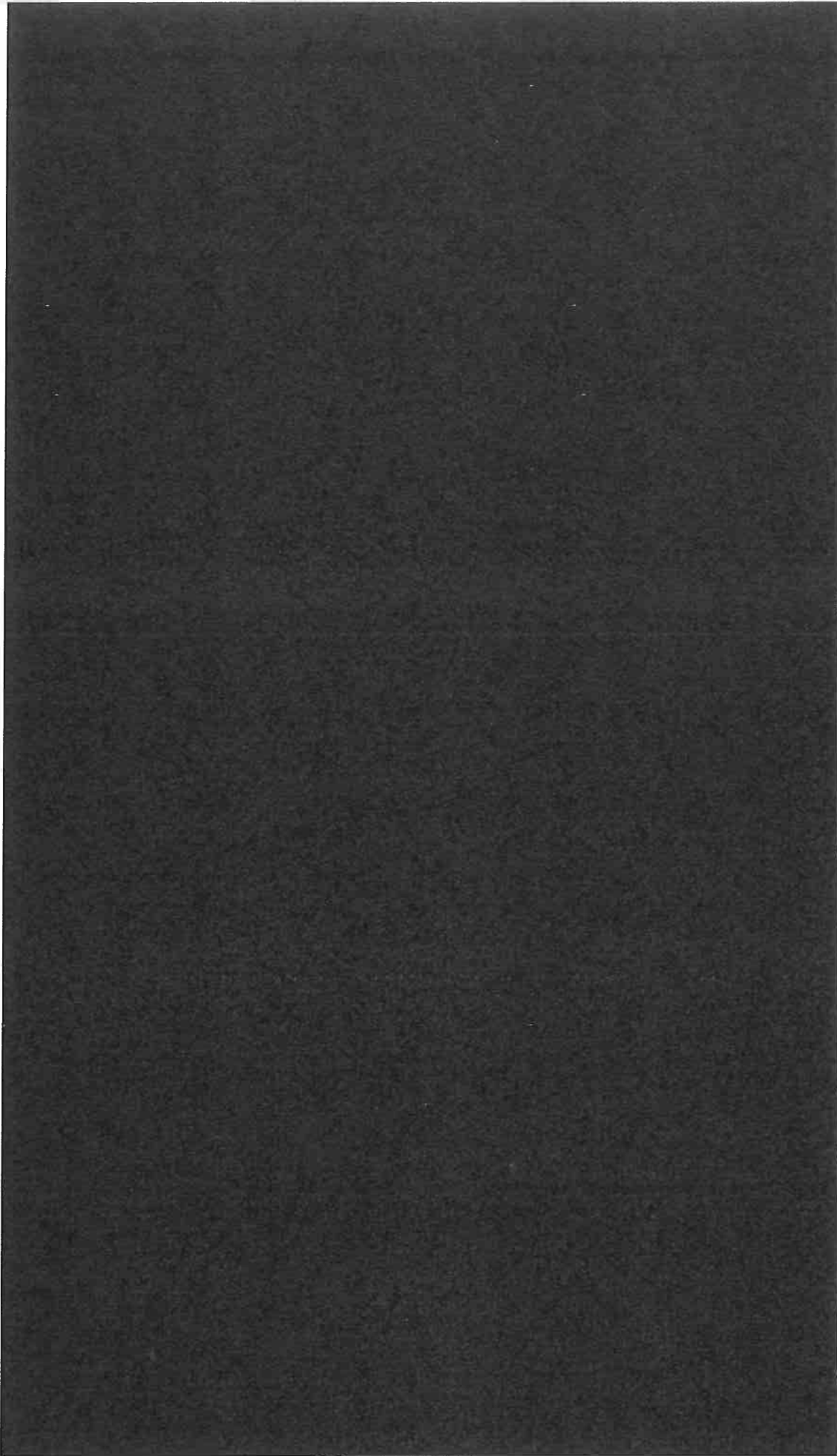
12.5 Appendix E – Risk Management Plan

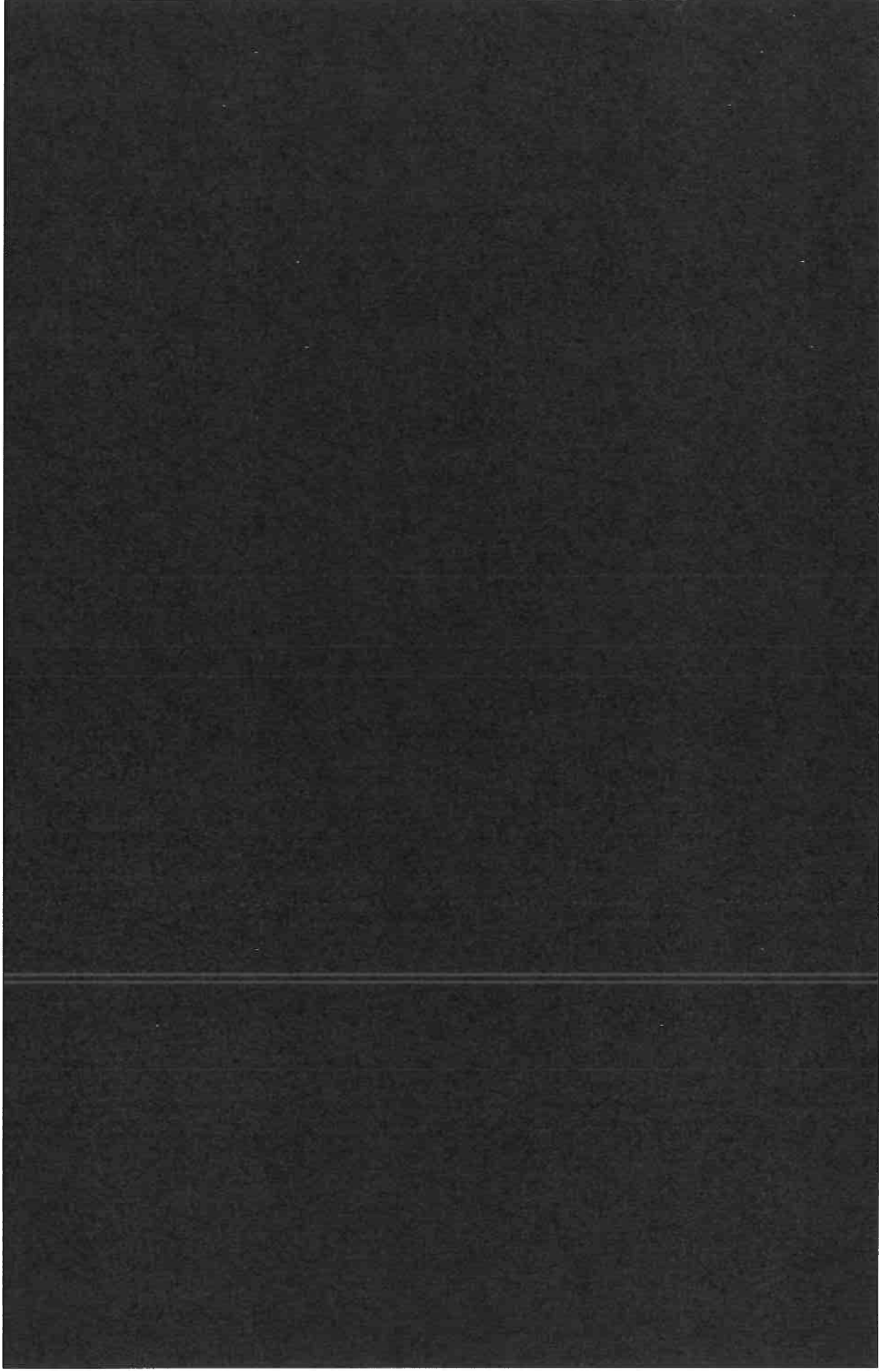


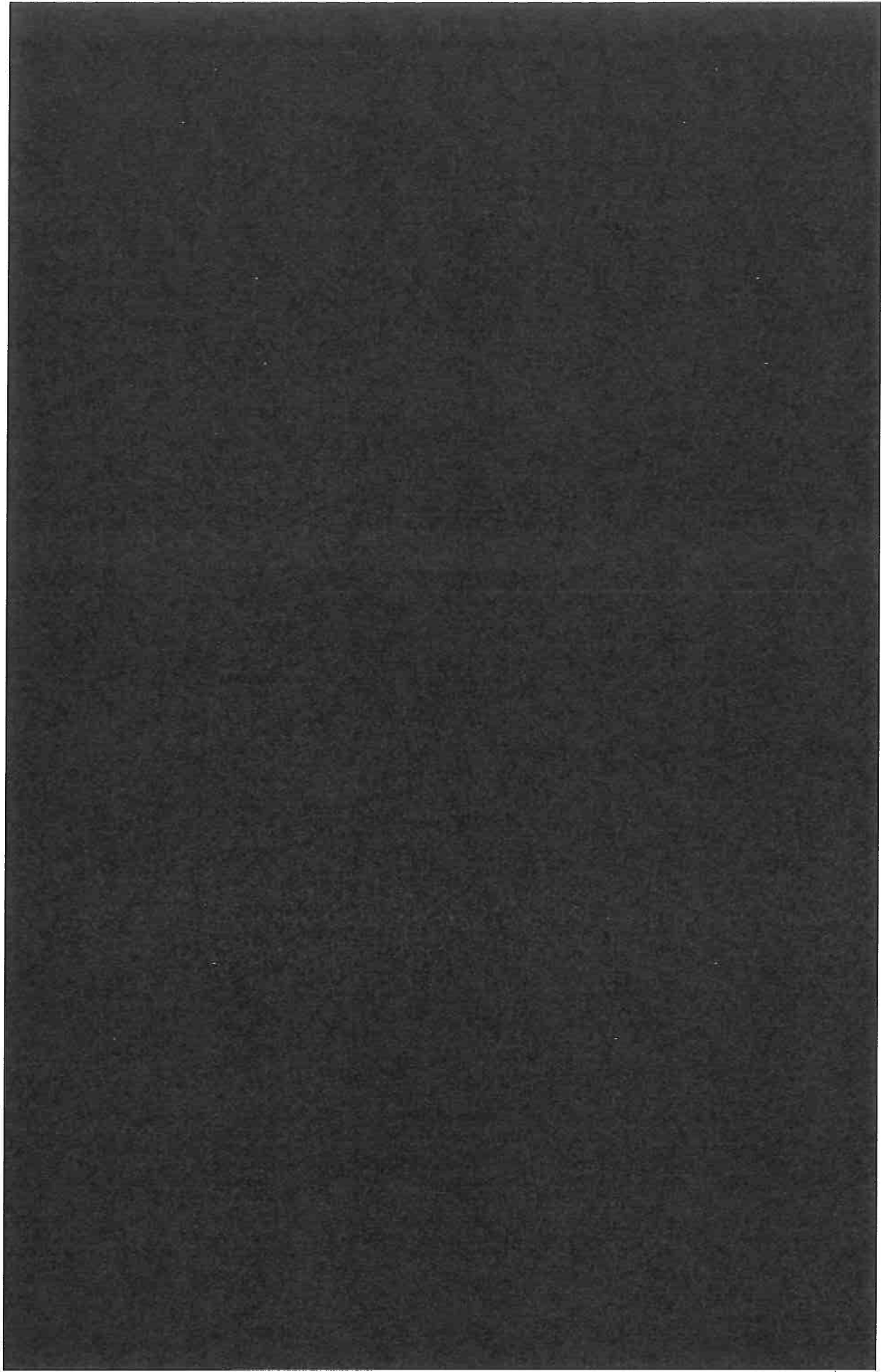


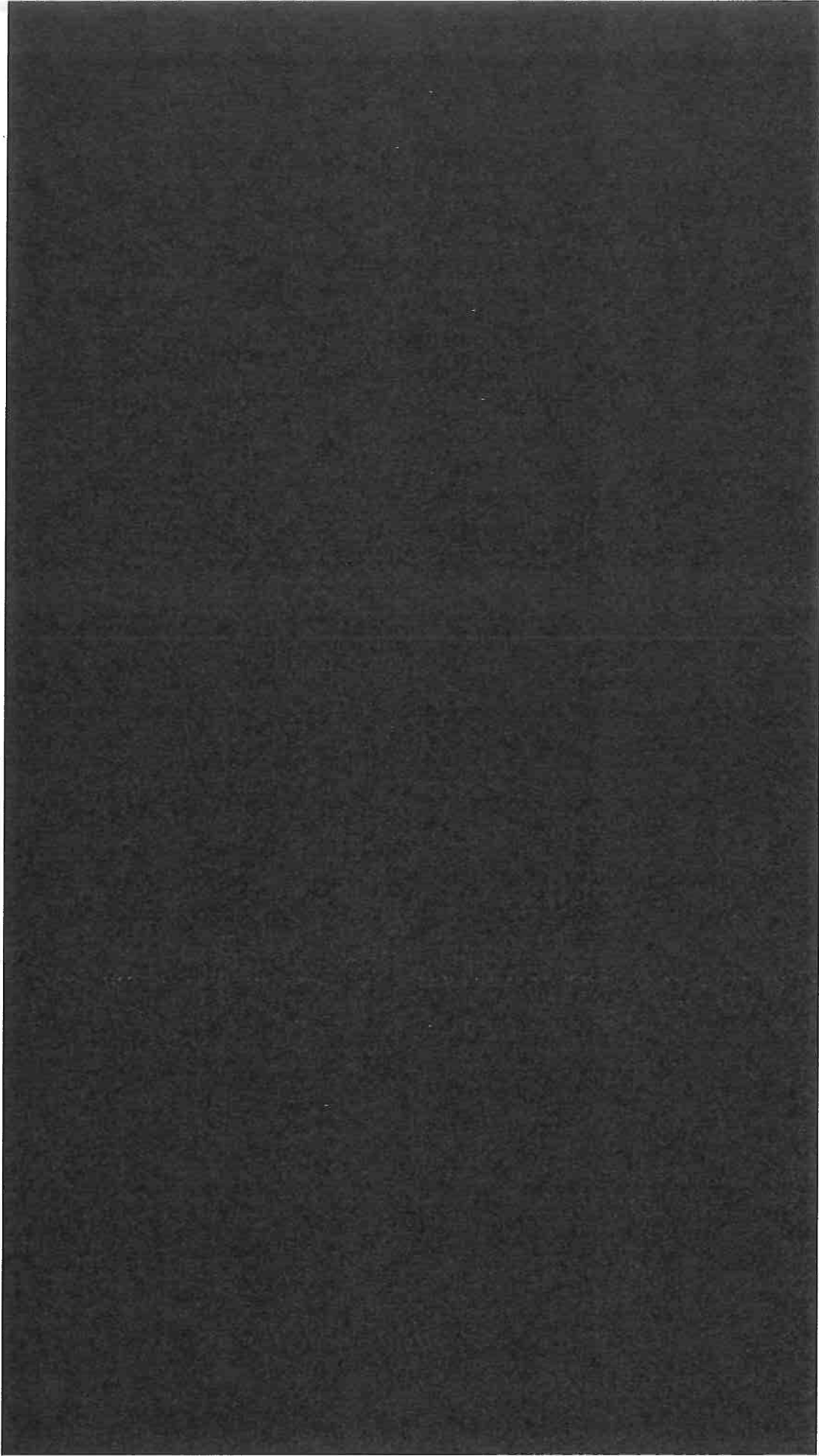












12.6 Appendix F – Stakeholder Engagement Plan

Stakeholder	Impact and interest on the project	Consultation to date	Method of Consultation	Planned consultation	Method of 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.	Consultation and Workshops	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.	Consultation and Workshops

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
Environmental Planning and Sustainable Development Directorate (EPSDD) –	Department of Planning and Approvals. They are responsible for the statutory planning framework for planning in the ACT, which aims to deliver independent, long-term planning to benefit Canberra's residents. They are responsible for overseeing the development of the EIS statement and compliance with EPA Standards.	Informal consultation to determine the correct approvals pathway (Impact track, EIS required) and information requirements for EPSDD to assess the FOGO processing proposal. EIS Scoping process, with the EIS Scoping Report formally submitted in early March 2021.	Consultation and Workshops	Development and submission of the detailed EIS through a Tender process to engage a consultancy to manage the EIS process in conjunction with the successful Tenderer for the Design of the facility. This Design and all criteria will inform EPSDD on the requirements are required to progress the EIS.	Consultation and Workshops and procurement processes.
Potential bidders/ technology providers	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.	Consultation and Requests for Submissions

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

Stakeholder	Impact and interest on the project	Consultation to date	Method of Consultation	Planned consultation	Method of Consultation
Special interest groups	These are the community groups that will be included in the community reference group. They are likely to be advocates such as current composting groups or environmental lobbyists who will be impacted by the facility.	None.		Community consultation workshops to understand community views towards the delivery of the facility.	Focus Groups / Workshops

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.
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Stakeholder	Impact and interest on the project	Consultation to date	Method of Consultation	Planned consultation	Method of Consultation
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.		identified, more detailed aspects of FOGO service provision will be explored and the interface between collections and processing will be established.	
Procurement ACT	Procurement ACT supports the delivery of many capital works projects in the ACT. Major Project Canberra supports the delivery of larger or higher risk projects. MPC has been confirmed as the agency for the FOGO procurement process.	Not engaged. ACT NoWaste has engaged with Major Projects Canberra (MPC), as MPC will be the agency supporting delivery of the FOGO infrastructure project.		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.	
				None. MPC will be the agency supporting delivery of the FOGO infrastructure project.	

12.7 Appendix G – Case Studies

Case study: Bunbury-Harvey Regional Council WA²⁹

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>

use in the next round of communications with their communities, as a way of showing the impact of contamination.

Compost outlets and experience

The current windrow process for FOGO material has worked well at the current site but is beginning to experience operational challenges including odour complaints at the throughout approaches the site's licenced limit. The move to a new in-vessel facility at the Stanley Road site will solve these issues while providing more capacity and secure land tenure.

FOGO material is mixed with shredded green waste and placed in windrows over the aeration system for pasteurisation. The piles are turned five times during the composting process. This was done monthly. However, as the site throughout has increased, turning has being increased to fortnightly, and the site has experienced some odour complaints as a result. BHRC has made some operational changes, including using odour suppression and not turning the windrows when the prevailing wind is towards sensitive receptors. These are seen as short-term adjustments until the new IVC facility is ready.

Compost is matured for 6 months and screened. Oversize material from the 50mm screening captures most of the contamination, including items like plastic bags and containers. This fraction is sent to the landfill as daily cover.

The <10mm fraction is the sold as organic compost.

The 10mm-50mm fraction undergoes further processing and screening to reduce as much material as possible to <100mm compost. Any remaining oversize material is used for landfill rehabilitation.

BHRC has recently launched the "360 Organics" brand to market their compost with a separate identify to the wider Regional Council operations. Their certified organic compost is sold into a range of markets, including:

- Horticulture, market gardens and orchards. Avocados farmers and orchards in the South-West region are important customers.
- Viticulture, particularly vineyards pursuing organic certification
- Sale to the public through transfer stations and landscaping suppliers
- Department of Main Roads verge rehabilitation

In addition to meeting AS4454 standards for mature compost, all compost is also certified organic under NASAA certification standards, regardless of the end customer. This involved an upfront cost for site certification and has ongoing implications for testing time before each batch is sold. Use of FOGO is not a barrier to organic certification. However, they have refused some commercial food waste supplies which contain a high proportion of genetically modified material in order to maintain the organic certification.

Organic farming in the area currently only makes up around 10-15% of their market outlet and this market is currently too small to generate a price-premium on organic compost. However, BHRC see

the organic certification as important to their brand and marketing. They 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/>

contamination campaign was carried out in the suburb of Casuarina, where high contamination rates were identified.

Compost outlets and experience

Currently, the council has no visibility or influence over the fate of its FOGO material, as this is blended with other feedstocks to create a range of different products at the Phoenix Power Recyclers facility in Queensland.

Completion of the IVC facility at Stotts Creek will see FOGO material returned to existing agricultural and domestic supply chains for compost. The facility will be located in a cane-growing area and product markets include broadacre application on cane farms. Broadacre farmers can accept compost with lower maturity levels, as this is often delivered in bulky loads and stored on farm for a period of several weeks or months before application to the fields. Maturation occurs during this on-farm storage period. Consequently, there is no dedicated space for maturation in the approved plans for the Tweed IVC facility.³² The design philosophy for this facility uses a longer time in the composting tunnels and no dedicated separate maturation phase, and this is expected to produce a material which is acceptable in the local market context.

Case study: Bega Valley Shire Council, NSW

Population

FOGO service provided to approximately 20,000 people. Total population approximately 35,000 people.³³

FOGO program introduced 2018

Tonnes of FOGO

4,000 tonnes in 2018/19

FOGO processing technology

Council-operated open windrow composting at their Merimbula Waste and Recycling site. FOGO composting uses a mobile aerated floor system. The council was already operating green waste shredding and mulching and has changed their operations to incorporate FOGO processing on the same site.

The council initially purchased a pull-behind windrow turner, tractor and waste cart, but this system wasn't able to process the volumes of FOGO material within the available site. The mobile aerated floor composting system speeds up the composting process and helps the council to process the FOGO material within the space constraints of their site.³⁴

Contamination rates and decontamination

³² <https://datracker.tweed.nsw.gov.au/Common/Output/Document.aspx?id=6493161&ext=pdf>

³³ <https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/wastestrategy/20p2373-appendix-waste-resource-recovery-report-2108->

³⁴ <https://wastemanagementreview.com.au/growing-a-fogo-community-bega-valley-shire-council-c-wise/>

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>

visiting population focused on physical materials such as multi-language brochures, fridge magnets, signage and other resources.⁴⁰

As a result of the strong led-in, residents were able to use the FOGO service as soon as it arrives. The FOGO collection recorded just 1% contamination in the first week of the service, dropping 0.8% in the week 2 and 0.6% in week 3.⁴¹ During its first year, the program achieved an average contamination rate of 0.4%, which is well below typical performance of Australian FOGO services.⁴²

The FOGO collection vehicles are fitted with cameras, which drivers use to inspect and photograph material as it is emptied in the truck. This system does not prevent all contamination being collected, but it provides the council with information to follow up with contaminating households.

Following the positive response and behaviour change among the community, the Bega Valley Shire Council expanded the FOGO service to schools. Schools can opt in to receive FOGO and recycling bins, and the council provides free collection and processing of the food waste.⁴³

Bega Valley Council have [published a lesson learned document online](#) to share their experience with other councils, and have also made their education and engagement materials available online.

Case study: Snowy-Monaro Regional Council, NSW

Population

FOGO service provided to approximately 3,600 people in the region. Total population approximately 20,000 people.⁴⁴

FOGO program introduced

First introduced for the Cooma township in 2015.

Tonnes of FOGO

Approximately 500 tonnes in 2018/19⁴⁵

FOGO processing technology

Open windrow composting operated by the Snowy-Monaro Council at their Cooma landfill site. The windrows are turned with a windrow turner and composted for 10-12 weeks.⁴⁶

Compost outlets and experience

⁴⁰

https://www.wmrr.asn.au/Web/WARR_Industry/Industry_Spotlight/Bega_Valley_Shire.aspx?WebsiteKey=00969b94-a8ff-49f3-8d36-264248d5094d

⁴¹ <https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/wastegrants/19p1770-fogo-collection-in-bega-valley-shire-case->

⁴² https://begavalley.nsw.gov.au/cp_themes/default/page.asp?p=DOC-DQM-50-44-25

⁴³ https://begavalley.nsw.gov.au/cp_themes/default/page.asp?p=DOC-RVC-05-78-51

⁴⁴ <https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/wastestrategy/20p2373-appendix-waste-resource-recovery-report-2108->

⁴⁵ <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>

⁴⁶ <https://www.snowymonaro.nsw.gov.au/824/Compost-Farm-Coompost>

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 trialling 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>

A strong relationship with waste collection teams, who manually inspect bins at the point of collection. Contamination is sometimes introduced by passers-by while the bins are presented at the kerbside, and this is manually removed from the surface of the food waste.

Case study: Corkhill Bros ACT

Corkhill Bros is one of the green waste processors in the ACT. They have a mature and established business located on ACT Government land at the Mugga Lane site. Corkhill Bros accept free drop-off of clean garden waste from households and businesses and produce a range of products for landscaping and horticulture. They also bring a range of other recovered and virgin materials onto their site for blending into final products, including pine bark (forestry residue), cow manure and washed sand. The Corkhill's business model targets markets where high-quality products can command a premium price, such as growing media for horticulture and flower shows. Not all of their products contain composted garden organics from the drop-off service. This business model allows them to accept clean green waste feedstock for free, without relying on gate fee revenue. Around 40% of their product is sold in the local area, while 60% is transported to interstate markets.

Case study: Sacyr compost facility, Victoria

This is a recent example of a private sector financing delivery model for a FOGO treatment facility.

In 2019, an indoor composting facility for municipal organic FOGO waste was opened in Melbourne, Victoria. Sacyr, a Spanish company, has a contract with the Victorian Metropolitan Waste and Resource Recovery Group (on behalf of a number of Victorian councils) for the provision of organic waste on the back of which it financed, designed, constructed, commissioned and operates the facility, for 15 years with a possible extension of five years.

The plant has a maximum capacity of 120,000 tonnes of waste per year and produces up to 50,000 tonnes of quality compost per annum. Public information suggests an overall project value of \$65 million of which the Clean Energy Finance Corporation provided \$38 million in debt financing.

Case study: UK experience with organics processing

Context and drivers

The UK focus over the last two decades on waste diversion from landfill and in particular on organic waste has been driven by EU policy and binding directives. The EU Landfill Directive set a target to reduce biodegradable waste to landfill to 35% of 1995 levels by 2020. In response, the UK developed a Landfill Allowances Scheme. It sets progressively lower limits on the tonnage of biodegradable waste which each council can send to landfill, charting a path to compliance with the broader EU targets. Councils failing to comply can face a financial penalty, and the UK potentially faced a national penalty under the Landfill Directive.

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.

⁴⁹

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

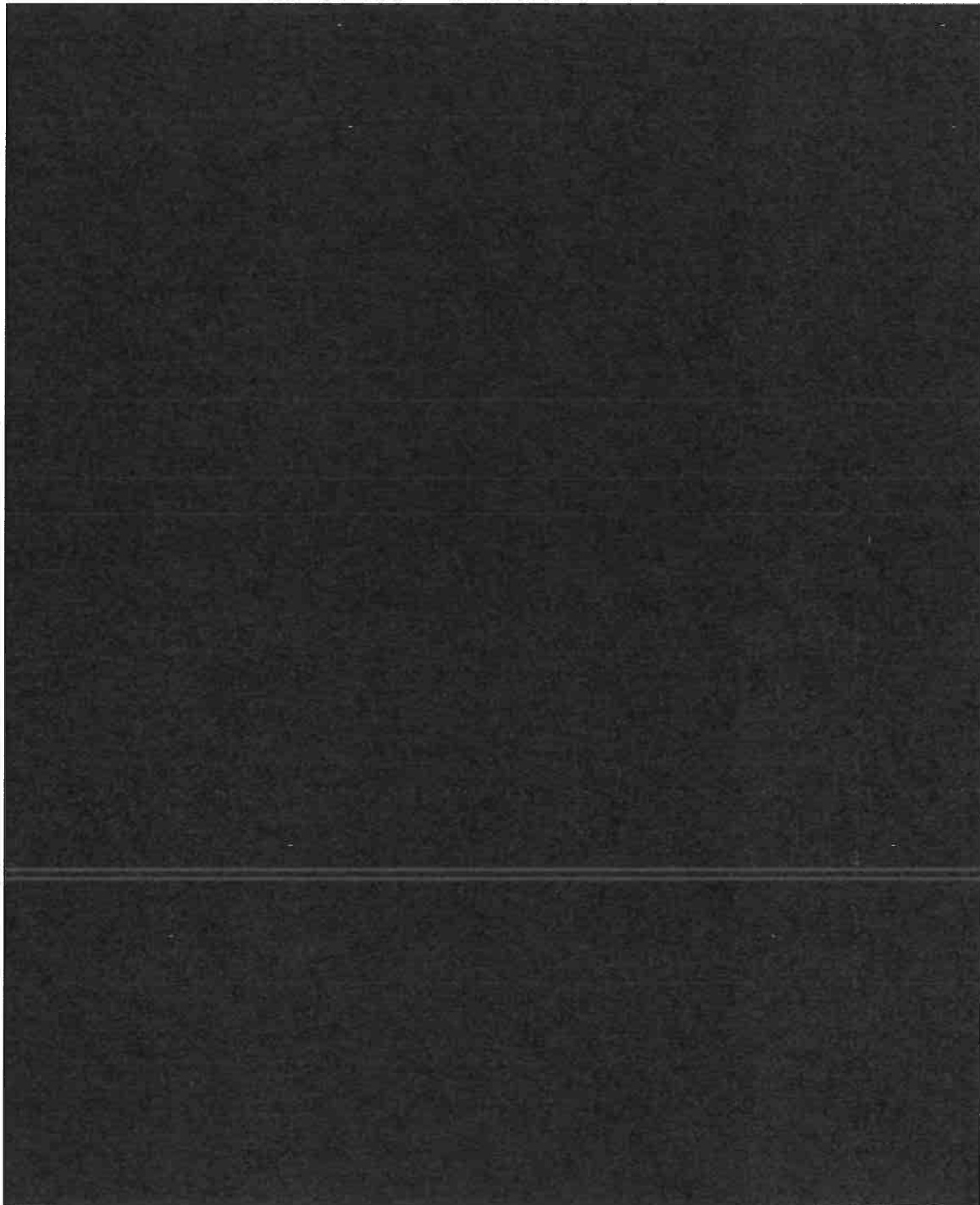
12.8 Appendix H – Monte Carlo simulation Output Reports

Capex

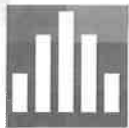


Total capex risk - 'Modelling capex'!AP17

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

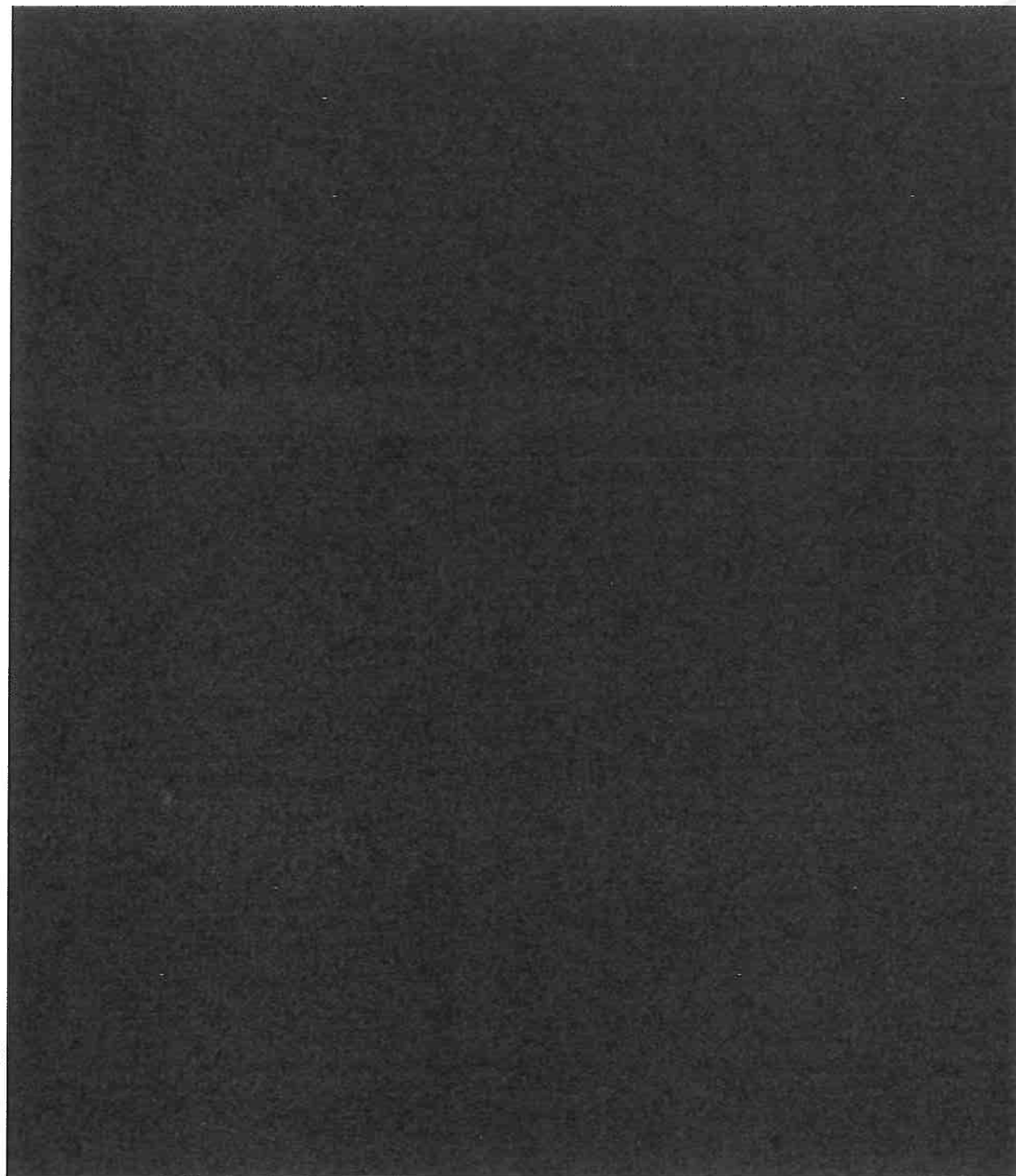


Opex



Total opex risk - 'Modelling opex'!AP9

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

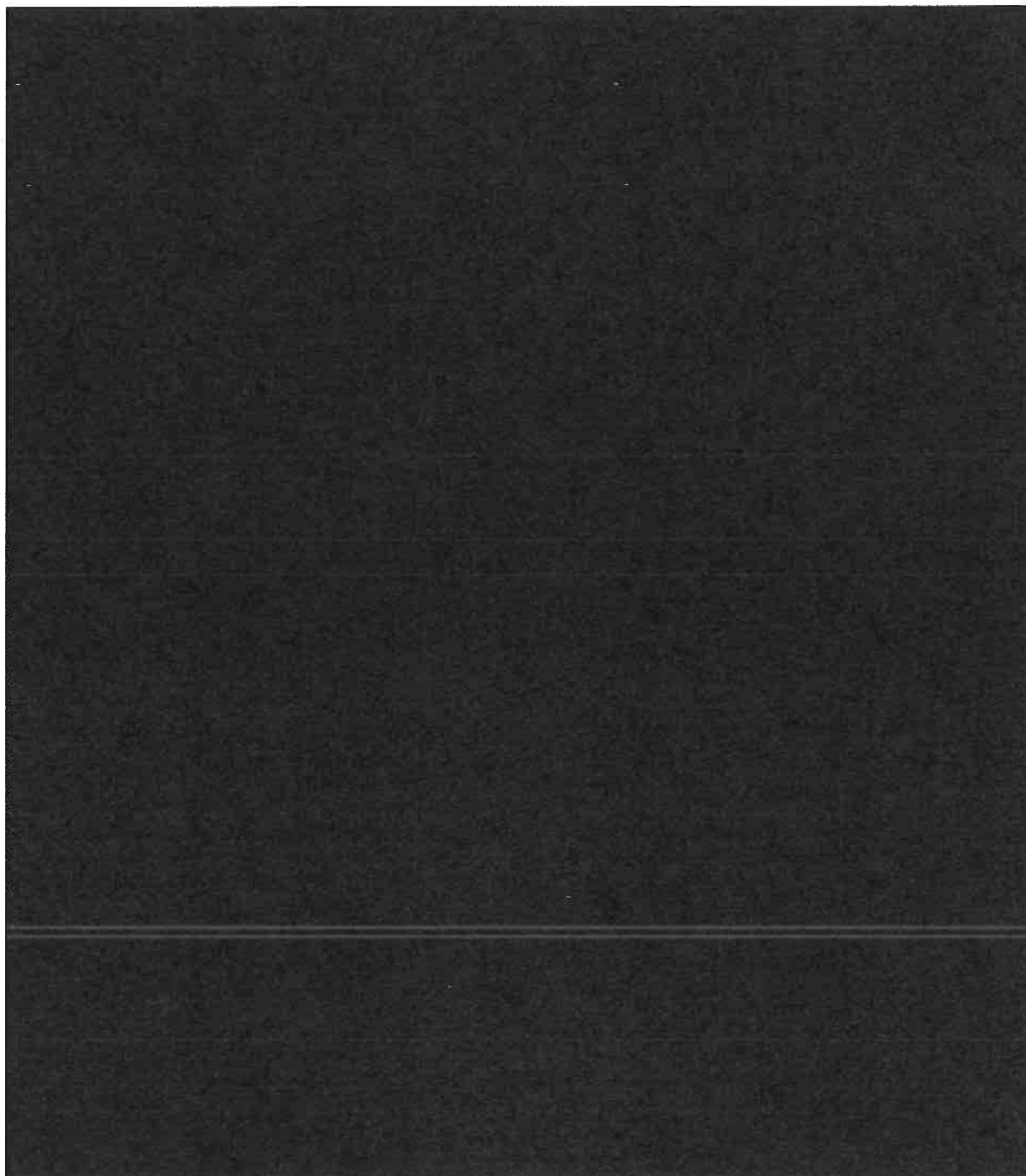


Revenue

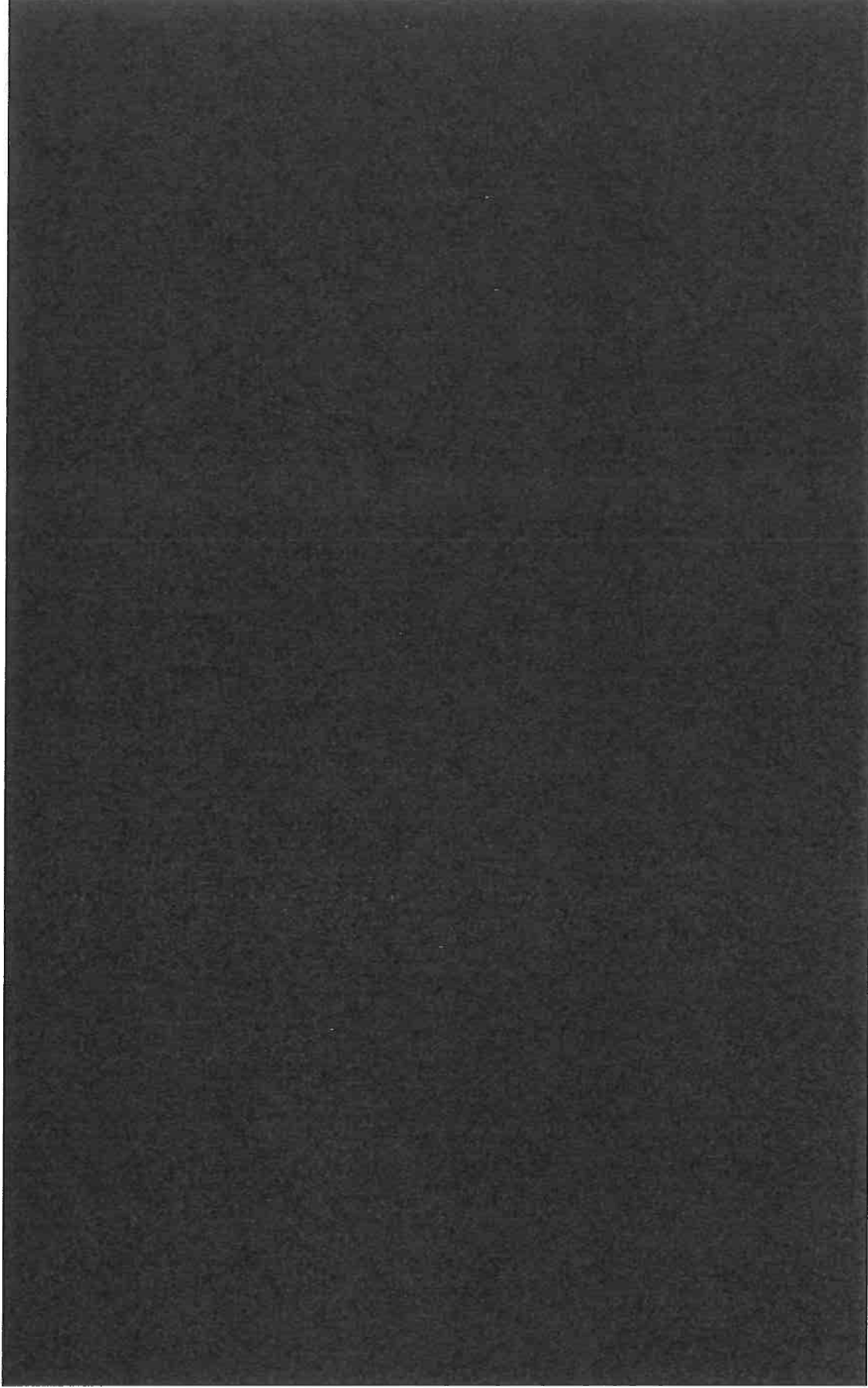


Sufficiency of end markets (revenue) risk - 'Modelling revenue'!AP7

Report: Compact Output Report
Performed By: Miles.Miranda
Date: Wednesday, 12 May 2021



12.9 Appendix I – DCMO and PSC Cash Flows



12.10 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 59: 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 60 below.

Table 60: 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	✓	✗	✗	✗
Is the useful life of the project asset over 10 years?	Yes	✓	✗	✗	✗

Issue	Project Details	Group 1	Group 2	Group 3	Group 4
Scope and outputs					
Are the project scope and outputs capable of clear definition?	Yes	✓	✗	✓	✗
Are design and construction complex, or does the project involve innovative technology?	No	✗	✓	✓✗	✗
Is the scope likely to change in a way that the Project Team cannot anticipate?	No	✗	✓	✗	✓
Are there any opportunities for bundling of non-core services and maintenance within the project?	Yes	✓	✗	✗	✗
Risk					
Is it possible to identify and quantify the main project risks?	Yes	✓	✗	✓	✓
Are there unquantifiable risks and uncertainties that could have a material impact on the project cost and objectives?	No	✗	✓	✗	✗
Is the cost of allocating the main project risks to the private sector likely to be prohibitive?	No	✗	✓	✗	✓
Score					
Ranking		1	4	2	3
✓ If the answer to the question is 'yes', these delivery models may be appropriate					
✗ If the answer to the question is 'no', these delivery models may not be appropriate					
Criteria suits the project					
Criteria does not suit the project					

The short-listing assessment suggests that Group 1, made up of DCMO and PPP is the most appropriate for the FOGO facility. Although scoring less, Group 3 is also suitable for the FOGO facility, with Delivery Models within carried through to the shortlist. Although PPPs are typically used for major economic infrastructure projects such as toll roads, it is also used for smaller projects with a component of user charges, such as waste treatment plants, with capital values of under \$50 million.

For this project, an availability PPP is less appropriate because revenues are anticipated (if under PPP delivery) through user charges; the Territory would be the key user and would likely need to commit 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.

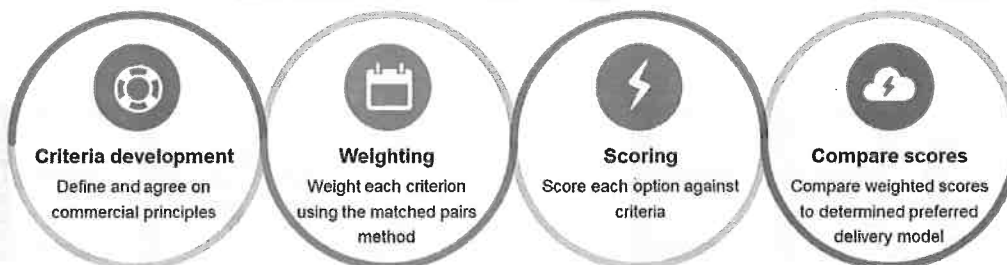


Figure 18: Multi-Criteria Assessment Framework

Criteria

The assessment criteria used for the MCA are a continuation of the Commercial Principles outlined in Section 6.2. These have been confirmed in a Procurement Workshop on the 15th of April 2020.

Weighting

Assessment criteria were weighted depending on their relative importance to each other. A three-point scale comprising High, Medium, and Low was used to weight the criteria. This was translated into a weighted total score using a 3:2:1 ratio.

The weighting was confirmed in an MCA workshop with ACT NoWaste and ACT Treasury. The results are summarised in Table 61 below.

Table 61: Commercial Principles Weighting

Criteria	Weighting (rounded)
Time to deliver	16%
Level of Integration / Bundled Services	16%
Level of risk transfer	16%
Flexibility	11%
Price certainty	16%
Procurement cost and level of complexity for Government	11%
Innovation and Incentive	11%
Output Specification	5%

Scoring

Each short-listed delivery model was scored in relation to the criteria using the scale shown in Table 62. Scoring was based on Table 5 in the *ACT Government Capital Framework, Draft Delivery Model Analysis Guidelines* as a starting point. These scores were then refined with input from ACT NoWaste and ACT Treasury team members to account for the nuances of this project.

Table 62: MCA scoring scale

Score	Description
1	The model does not meet the assessment criterion
2	The model marginally meets the assessment criterion
3	The model meets the assessment criterion
4	The model exceeds the assessment criterion
5	The model is superior to the assessment criterion

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

CABINET-IN-CONFIDENCE (after first entry)

Delivery Model	Score: Flexibility	Justification
		cumbersome to change to realise improvement.
Design Construct Maintain (Long Term)	2	Project generally needs to be scoped from the outset resulting in limited ability to innovate or upgrade over the life of the plant
Design Construct Maintain Operate	2	Project generally needs to be scoped from the outset resulting in limited ability to innovate or upgrade over the life of the plant
User Charge PPP	1	Given the use of private sector financing, and the need to have more rigid longer term arrangements in place to ensure private sector lender and investor appetite, government generally has limited ability to vary once project commenced

Level of Service / Integration

Delivery Model	Score: Level of Service / Integration	Justification
Design then Construct	1	Focused only on construction stage; no integration of outcomes beyond construction
Design & Construct	1	Focused only on construction stage; no integration of outcomes beyond construction
Design Construct Maintain (Short Term)	3	Addresses maintenance beyond construction phase but not ongoing operational considerations
Design Construct Maintain (Long Term)	3	Addresses maintenance beyond construction phase but not ongoing operational considerations
Design Construct Maintain Operate	5	Full integration of the life cycle of the project
User Charge PPP	5	Full integration of the life cycle of the project

Level of Risk Transfer