Hamilton-Waikato Metropolitan Area

# Southern Metro Wastewater

## Detailed Business Case Executive Summaries

**Ko te taipitopito whakaraapopoto o te maahere paakihi**

Hamilton City Council
Te kaunihera o Kirikiriroa

WAIKATO TAINUI

Future Proof
Te Tau Tītoki

Waikato DISTRICT COUNCIL

Waipā DISTRICT COUNCIL

WAIKATO METRO WASTEWATER

# Contents

# Strategic Case

## He Keehi Rautaki – He keehi kaha moo te panoni

### *Introduction*

This report sets out the Strategic Case for the Waikato Southern Mero Area Wastewater Detailed Business Case (Southern Metro DBC). The purpose of the Strategic Case is to evaluate the need for the project and the case for change. The case for change has been informed by examining the problems of the existing wastewater management situation and refining the benefits of addressing the existing problems. Investment objectives are also defined to inform the other cases.

**This report also includes:**

- An overview of the approach taken to develop the DBC
- Strategic context relevant to the Waikato Metro Area and this DBC including geographic extent, historical context, Te Tiriti o Waitangi Settlements, wastewater assets, previous wastewater servicing investigations, relevant policies and plans, and population and land use assumptions.

Local authorities, iwi, communities and industry face significant challenges in meeting their current and future three waters service needs.

The Waikato Metro Wastewater Detailed Business Case (DBC) seeks to provide a long-term wastewater infrastructure solution for the Hamilton-Waikato-Waipa Metropolitan Areas.

The study area for this DBC includes the following communities and areas of future development, which lie within the Metro Area. These communities have been separated into northern and southern areas:

| Northern Communities | Southern Communities |
|---|---|
| Taupiri | Mātangi |
| Hopuhopu | Tamahere |
| Ngaaruawaahia | Hamilton Airport |
| Horotiu | Ohaupo |
| Te Kowhai | Cambridge/Karapiro |
| Hamilton (North) | Te Awamutu/Kihikihi |
| Area east of Hamilton | Tauwhare |
| | Tauwhare Pa. |

The Waikato Sub-regional Three Waters Strategic Case (2019) highlights the water infrastructure issues the Waikato River sub-regional catchment area is currently facing. These issues relate to all three waters (i.e., drinking water, wastewater and storm water) and to the wider management of water resources and infrastructure. The programme level problem statements have been adopted for this Project and refined to reflect the specific wastewater issues within the Metro Area. The table below provides a high-level summary of the programme problems.

## Programme problem statement and relevance to the project

### Problem One

**Lack of integrated catchment management and urban waters long-term planning.**

Founded on:

- a common vision and agreed future outcomes that are unconstrained by territorial boundaries
- the application of both Maatauranga Māori and conventional science methods, and
- appropriate funding provisions
- is resulting in inefficient, near-sighted decision-making and degraded health and well-being of the Waikato River.

#### Relevance to Wastewater Treatment within the Metro Area

There is currently no long-term integrated wastewater services planning, funding or operations and maintenance across the Metro Area. This creates the potential for misalignment in wastewater planning and servicing objectives, methods and approaches.

Development and land use changes often occur without full appreciation of the impacts on wastewater infrastructure and the investment needed to provide capacity for growth, in the short and long-term. As a result, development and growth can occur without the necessary infrastructure and investment needed to service it. This adds more pressure to existing systems, and at times contributes to further degradation of the health and wellbeing of the Waikato River through increased contaminant loading from wastewater treatment plant discharges and network overflows.

This problem has led to reactive and short-sighted wastewater infrastructure decisions in the Metro Area.

The impact of these short-sighted and reactive investment decisions are further evidenced in problem two.

## Problem Two

**Historic land confiscations coupled with inconsistent, short-term and parochial regulatory, planning and investment decisions on land use and urban water resource management.**

Have contributed to:

- cultural disconnect,
- degraded water quality,
- poor ecosystem health and over allocated resources.

As a consequence, the relationships and aspirations of communities with the Waikato River and the ability of Waikato River iwi to exercise mana whakahaere or conduct their tikanga and kawa have been severely compromised.

### Relevance to Wastewater Treatment within the Metro Area

Problem two further investigates how short-sighted and reactive investment decisions have affected river water quality, river ecosystems, Te Mana o te Awa and contributed to the cultural disconnect, through an inability by mana whenua to exercise mana whakahaere.

There are differences in the way that council engage with Iwi and mana whenua on wastewater activities across the Metro Area.

Currently individual councils react to wastewater issues as they occur, making it difficult to apply consistency and planned decision making to the wider wastewater treatment network.

This means wastewater treatment facilities are consistently falling short of environmental and cultural standards and impacting the health and wellbeing of the river.

## Problem Three

**Reactive infrastructure planning practices.**

Coupled with:

- light-handed regulation and compliance
- inconsistent management practices, standards and performance expectations
- has led to variable urban water system performance across the region and has adversely impacted the health and well-being of the Waikato and Waipā Rivers.

### Relevance to Wastewater Treatment within the Metro Area

Reactive infrastructure planning practices are evidenced in problem statements one and two.

This problem focuses on the issues of regulation, compliance and inconsistent and changing practices, standards and performance expectations across the three councils concerning the treatment of wastewater and how this has led to variable performances of WWTPs.

## Problem Four

**The legacy of under investment in urban water systems.**

Coupled with:

- infrastructure reaching end of life.
- increasing regulatory requirements;
- environmental expectations.
- climate change impacts.
- greater growth demands;

has created a significant investment deficit. This has resulted in unaffordable current and future costs for new infrastructure, maintenance and operations and human capacity and capability challenges within the waters sector.

### Relevance to Wastewater Treatment within the Metro Area

This problem further investigates issues related to affordability, ageing infrastructure and assets, climate change impacts and growth and capacity impacts. These have all led to a wastewater infrastructure deficit across the Metro Area.

Ageing wastewater infrastructure, increasing regulatory requirements and environmental expectations, climate change impacts and greater growth demands have created a significant investment deficit in the Metro Area.

To accommodate partner and stakeholder expectations for future growth, to make the necessary performance improvements to current infrastructure that recognise and provide for Te Mana o te Awa, Mana Whakahaere, and give effect to Te Ture Whaimana, requires an approach founded on Te Tiriti o Waitangi and a long-term wastewater servicing strategy unconstrainted by territorial boundaries.

## *Investment Objectives*

SMART investment objectives (Specific, Measurable, Attainable, Relevant and Time bound) that apply specifically to wastewater management have been developed to inform options assessments and identification of the preferred servicing solution for the Southern Metro Area.

The investment objectives were developed and agreed by the project partners as part of this DBC. The investment objectives also built on the Best for River Statements and high-level objectives developed in the Strategic Case – Compelling Case for Change and with reference to relevant regulatory and planning documents, including Te Ture Whaimana o Waikato and Tai Tumu Tai Pari Tai Ao. The following objectives have been developed to align with the Te Ture Whaimana and the Best for River definition.

| | |
|---|---|
| **1** | Before 2050 municipal wastewater discharges are no longer impacting on the ability of people to swim and collect kai from the river and connected waterways, thereby contributing to the restoration and protection of the health and wellbeing of the river. |
| **2** | The quality and extent of aquatic and terrestrial habitat and biodiversity in and around water bodies is enhanced through the reduction of wastewater treatment and discharge impacts before 2050. |
| **3** | Wastewater treatment solutions contribute to restoring and enhancing cultural connectivity with the river so that before 2050 marae, hapuu and Iwi access to the river and other sites of significance for cultural and customary practice within the Metro Area are no longer impeded by wastewater treatment solutions. |
| **4** | Maximise efficient use of resources and resource recovery to contribute to net zero greenhouse gas related emissions from wastewater treatment systems before 2050. |
| **5** | The wastewater solution provides sufficient capacity to ensure sustainable growth in the Metro Area in accordance with growth projections assumptions for the next 100 years. |

## *Benefits*

Three benefit statements were developed as part of the Waikato Sub-regional Three Waters Strategic Case. This project, whilst only focusing on wastewater treatment within the Metro Area will contribute towards delivering these benefits. This is outlined further below.

### Benefit One

**River health and quality is enhanced and people's connection with the River is restored.**

This benefit statement relates to:

the need to work collaboratively towards achieving the goals and objectives of Te Ture Whaimana

the need to improve the water quality of the Waikato River along its entire length, including reducing turbidity, E.coli bacteria and nitrogen and phosphorous contaminants present in the river

improving people's connections, interactions and appreciation of the river, and increasing the length of the river that is suitable for swimming and safe collection of kai. The Waikato River and region's waterways can be used more actively and commonly for customary, recreation and education practices.

#### Relevance to Wastewater Treatment within the Metro Area

The DBC contributes to achieving this benefit through:

- The partnership approach and collaboration that is central to delivering this DBC
- Adopting Te Ture Whaimana as the project vision and ensuring direct linkages between the project SMART objectives and Te Ture Whaimana to ensure it is at the forefront of all considerations.
- Project objectives 1, 2 and 3 align directly with this Benefit Statement.

### Benefit Two

**Commitment and dedication to a collaborative and integrated approach to land, water, community planning that is holistic, integrated, aligned with community aspirations, and provides opportunities for involvement by the wider community.**

#### Relevance to Wastewater Treatment within the Metro Area

The project is intended to deliver an integrated, holistic and collaborative wastewater treatment solution. The scope of the project (i.e. the Metro Area) is broader than the territorial boundaries and considers wastewater treatment as a wider network, rather than in isolation. By assessing solutions in a boundaryless way, the Project is well placed to achieve a collaborative response to the wastewater treatment issues in the Metro Area.

Wider land use and development decision-making has also been incorporated into the Project to deliver a fully integrated approach. It is expected that the Metro Spatial Plan (as outlined in Appendix B) will evolve to align with the metro-wide wastewater treatment strategy to be developed as part of this Project.

## Benefit Three

**Deliver Best for River solutions and approaches for managing growth and resource sustainability.**

This benefit statement relates to:

- the need to invest efficiently in existing and new three waters infrastructure to meet growth demands for appropriate land uses and improve the capacity and capability to efficiently manage associated waters infrastructure provisions
- the need to prioritise investments in the sub-region as a whole based on the condition and risk of assets, and offset maintenance and renewal costs through a reduction in reactive repair and maintenance costs
- the need to achieve national/regional standards and targets, and investment in infrastructure and servicing solutions that are energy efficient to deliver Best for River outcomes. There are strong linkages between this benefit and the targets and outcomes sought in the World Future Council's Regenerative Cities report:
- Initiating comprehensive political, financial and technological strategies for an environmentally enhancing, restorative relationship between urban communities and the ecosystems from which they draw resources for their sustenance[8]

### Relevance to Wastewater Treatment within the Metro Area

Project objectives 4 and 5 align directly with this Benefit Statement.

# Economic Case
## He Keehi Whakarauora – he tirohanga whaanui

### *Purpose*

This report sets out the Economic Case for the Waikato Southern Metro Area Wastewater Detailed Business Case (Southern Metro DBC).

The purpose of the Economic Case is to evaluate options available to address the problems identified in the Strategic Case. The assessment of these options uses several criteria including the project objectives which have been identified in the Strategic Case and other critical success factors. The Economic Case aims to identify a Preferred Option that delivers best public value including wider social and environmental effects.

This report provides an overview of the preferred option, the approach to the development and assessment of options and the refinement and details of the preferred option.

## *Project Vision and Objectives*

The project vision is to identify long-term wastewater treatment solutions for the Waikato-Hamilton Waipā Metro Area. This report covers the area from the southern part of Hamilton City, through to Cambridge, Te Awamutu and Kihikihi (known as the Southern Metro Area). It evaluates sub-regional solutions that operate across territorial boundaries to deliver higher quality outcomes, community benefits and overall efficiencies compared to solutions constrained by territorial boundaries.

**Tooku awa koiora me oona pikonga he kura tangihia o te maataamuri**

*"The river of life, each curve more beautiful than the last"*

...a future where a healthy Waikato River sustains abundant life and prosperous communities who, in turn, are all responsible for restoring and protecting the health and wellbeing of the Waikato River, and all it embraces, for generations to come[1].

1 Te Ture Whaimana o te Awa o Waikato

Project objectives were developed and agreed with the project partners and are based on giving effect to Te Ture Whaimana, the Best for River definition and other key drivers. Project objectives are:

1. Before 2050 municipal wastewater discharges are no longer impacting on the ability of people to swim and collect kai from the river and connected waterways, thereby contributing to the restoration and protection of the health and wellbeing of the river.

2. The quality and extent of aquatic and terrestrial habitat and biodiversity in and around water bodies is enhanced through the reduction of wastewater treatment and discharge impacts before 2050.

3. Wastewater treatment solutions contribute to restoring and enhancing cultural connectivity with the river so that before 2050 marae, hapuu and Iwi access to the river and other sites of significance for cultural and customary practice within the Metro Area are no longer impeded by wastewater treatment solutions.

4. Maximise efficient use of resources and resource recovery to contribute to net zero greenhouse gas related emissions from wastewater treatment systems before 2050.

5. The wastewater solution provides sufficient capacity to ensure sustainable growth in the Metro Area in accordance with growth projections assumptions for the next 100 years.

## *Partnership and Collaboration*

Growth assumptions have been developed in conjunction with the three councils, Waikato-Tainui and with reference to relevant strategic planning documents. The growth assumptions have informed development of the preferred option. Growth assumptions have been used to size the system components for the long list, short list and preferred options and include:

- Existing development (residential and non-residential).
- Infill development.
- Planned commercial industrial development (e.g. Ngaaruawaahia, Taupiri, Te Kowhai, Hopuhopu, Horotiu, Te Rapa North, Rotokauri, Ruakura, Airport, Cambridge/Hautapu).
- Planned residential greenfield development (e.g. Taupiri, Hopuhopu, Ngaaruawaahia, Te Kowhai, Rotokauri, Peacocke, Temple View, R2, HT1, WA, Cambridge and Te Awamutu growth cells).
- Additional infill development as noted in the Metro Spatial Plan[2].
- 'Wet industry' allowances at Horotiu, Te Rapa, Ruakura, Airport and Cambridge. While these allowances have been included in the current DBC, the most appropriate locations for wet industrial activity in the Waikato Metro Area should be properly considered and discussed by Future Proof.
- The ultimate design horizon also includes 35,000 Population Equivalent (PE) for the area between the Southern Links designation and the current Hamilton City Boundary, and an additional 30,000 PE in the vicinity of Ruakura.

2 Hamilton-Waikato-Metropolitan-Spatial-Plan-Final-Low-Res.pdf (futureproof.org.nz)

## *Longlist Development and Assessment*

This project builds on previous wastewater servicing investigations for the metro spatial area, which includes urban areas from Ngaaruawaahia in the north, Hamilton, Cambridge, Te Awamutu to the south and smaller catchments in between. Some of the most relevant investigations are summarised in Table [3] of the Strategic Case.

The most recent and relevant previous feasibility study[3] was a pre-cursor to this DBC and identified a long list of six metro wastewater treatment solutions. The outcome of this study recommended the following options for further development:

- Convey all communities to a northern and southern centralised facility (new site).
- Convey all communities to a northern and southern centralised facility (Cambridge site).
- Five wastewater facilities to cater for the whole Metro Spatial Area including a new southern facility.
- Upgrades of existing facilities and new decentralised facilities at Whatawhata, the airport and Ohaupo.

Eight longlist options were developed for the Southern Metro Area Wastewater DBC based on the options above plus the inclusion of Fonterra for each option, as detailed in Section 3.2. These options were developed to meet the outcomes detailed in the Wastewater Treatment Assumptions Memorandum[4].

The longlist Multi-Criteria Analysis (MCA) assessment results identified Option 2A (involving a new southern facility on a new site) and Option 3A (building a sub-regional plant on the Cambridge site) as the highest overall scoring options (detailed in the Longlist Report, Appendix D). Both options also included upgrades of the Pukete and Te Awamutu WWTPs.

3 Future Proof Partners, 2020. Hamilton Metro Wastewater Treatment Feasibility Study. Retrieved 25 Feb 2021, from https://www.futureproof.org.nz/assets/FutureProof/H2A/Waters/Final-Metro-Area-Wastewater-Treatment-Feasibility-Study_with-Appendices.pdf

4 Wastewater Treatment Assumptions for Waikato Metro Wastewater DBC, August 2020, included in Appendix F, Preferred Option Technical Report, September 2021.

## Option 2A

**Option 2A was the highest performing option based on the MCA assessment and was progressed to the shortlist stage.**

It was considered the benefits associated with building a new plant on a new site would outweigh the risks involved in consenting and approving a new site.

A new site would offer the opportunity to masterplan a treatment facility to achieve the greatest long-term operational efficiency and flexibility to adapt to load, technology and resource recovery opportunities. A new site would be able to adapt more quickly and easily to growth changes.

A central location was also considered to reduce the length of large diameter rising main pipework and would allow for greater development opportunities when compared against Option 3A.

Additionally, a new location south of Hamilton is closer to the airport industrial area. This area has significant industrial growth potential which would provide greater opportunities for industrial water reuse.

## Option 3A

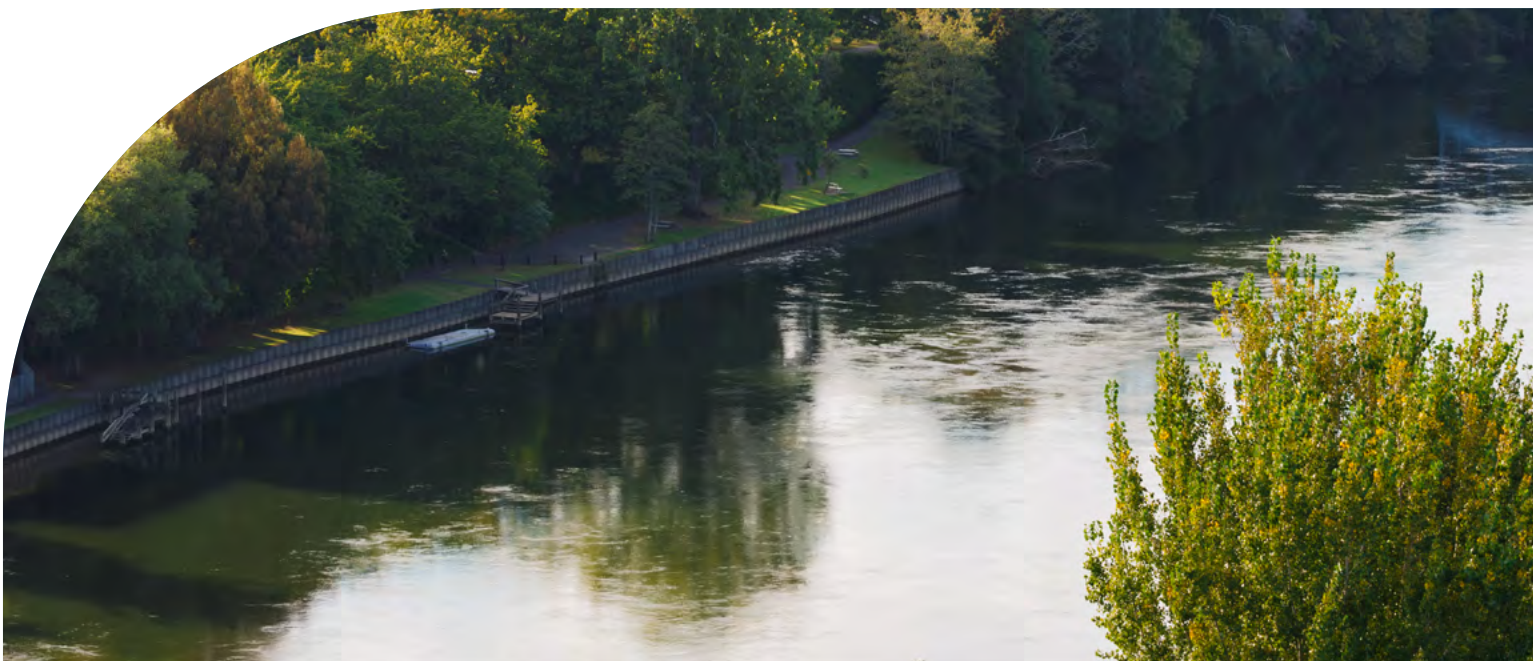
**Option 3A (a sub-regional plant on the Cambridge site) was the second highest scoring option based on the MCA assessment.**

This option was not progressed to the shortlist stage for a number of reasons including long conveyance lengths, logistical challenges with constructing on an existing site whilst keeping the plant operational and compliant during construction, geotechnical risks with the site, limited ability for resource recovery and re-use limited space availability and potential for reverse sensitivity based on surrounding residential land use.

**A modified Option 4A was proposed as the Enhanced BAU option.** For comparative purposes, an Enhanced BAU option was also carried through to the shortlisting stage. Option 4A was considered to be a more appropriate than Option 1A.

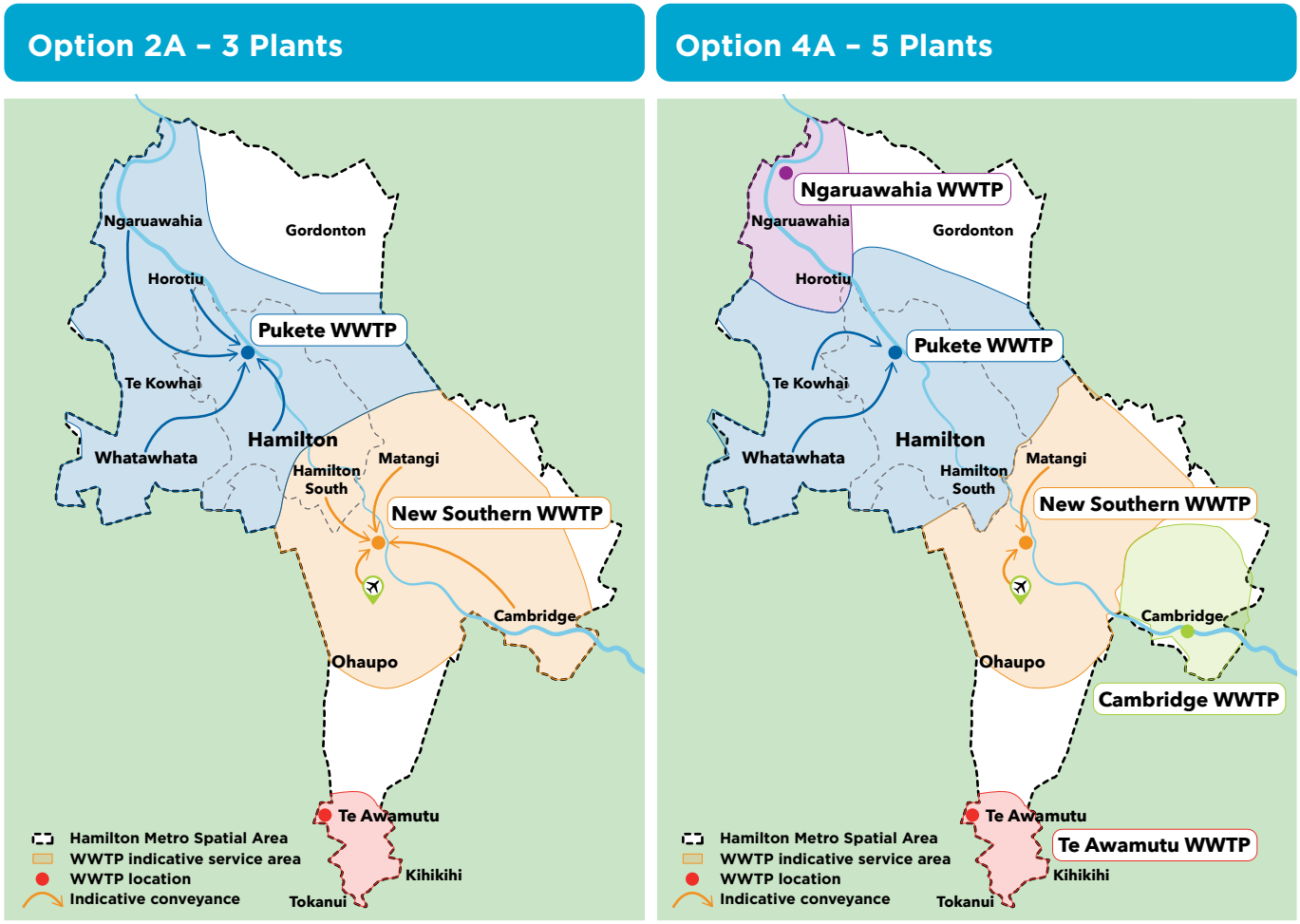
The recommendation for the shortlist was:

- **Option 1 - Do Nothing** (for comparative purposes only)
- **Option 2A - Three Plant Option** – Involves upgrades and expansion of the Pukete WWTP to service the Northern Metro Area (including Taupiri, Ngaaruawaahia, Te Kowhai, Horotiu and majority of Hamilton); a new southern plant to service the Southern Metro Area (including Hamilton South; airport area and environs, Cambridge) and the Te Awamutu WWTP.
- **Option 4A - Five Plant Option** – Involves treatment plant upgrades at Ngaaruawaahia, Pukete, Cambridge and Te Awamutu and a new southern plant to service the airport area and environs.



The service areas of the short-listed options are below and are diagrammatic.

**Figure EC - ES 1: Diagrammatic Overview of Short-listed Waikato Metro Area Wastewater Servicing Options**




The shortlisted options assessment (detailed in the Shortlist Options Report, Appendix E) noted Option 2A as the emerging preferred option. Option 2A was the highest scoring option from the raw MCA assessment and the MCA sensitivity assessments.

Option 4A was recommended for shortlisting over Option 1A as it involves a smaller number of med-large plants which aligned closer to the better achieve project objectives and is more pragmatic and efficient than having many smaller plants. Option 4A scored better than Option 1A for affordability, given Option 1A has limited potential for additional funding sources.

## *Shortlist Development and Assessment*

From October 2020 - February 2021 all three shortlist options were subjected to detailed assessments against MCA criteria. The results informed the selection of a preferred option.

A preliminary shortlist option assessment occurred during October - November 2020, followed by re-assessment in February 2021 based on more detailed information.

**The key outcomes of the re-assessment and cost estimate comparisons were:**

- Option 4A and Option 2A achieved similar outcomes in relation to the investment objectives and Best for River outcomes.
- Option 4A and Option 2A were assessed as having a similar ability to be successfully consented and implemented.
- Option 4A had a capital cost estimate[5] of $652 million compared with Option 2A ($716 million[6]). These included capital costs for wastewater plant investments for the Northern and Southern Metro areas to accommodate projected growth out to 2071. Conveyance networks to new treatment plants as well as consenting, procurement, land purchase, make good and council construction overheads were also included.

A Net Present Value (NPV) assessment was undertaken during the shortlist assessment phase. This identified that Option 4A had an NPV estimate of -$1,096 million compared with Option 2A (-$1,212 million). Assumptions included capital cost inflation of 3%, operating cost inflation of 2%, costs modelled to 2071 and 5% discount rate).

Option 4A is assessed as more affordable than Option 2A as it gives project partners the potential to defer some capital costs in the first and second decades (2031 and 2041) as well as stage delivery of wastewater servicing for the airport area and environs and Hamilton South.

Development of the shortlisted options included more detailed consideration and refinement of the capital and operational costs associated with servicing the Southern Metro Area. The main capital cost components include:

- Southern Sub-Regional WWTP including staged WWTP development plus land acquisition, master planning and consents, outfall, conveyance from Mātangi (2041), conveyance from Hamilton South (post 2061).
- Cambridge WWTP redevelopment.
- Mātangi WWTP minor improvements (up to 2041).
- Te Awamutu WWTP upgrade.
- Tauwhare Pā WWTP upgrades.

The refined costs and subsequently updated NPV results are shown in the table below (and provided in the Financial Case). The costs have been discounted using a 5% real discount rate (i.e. no inflation has been applied to costs). The key difference here is changing from a Real to a Nominal discounting methodology to align with Treasury's approach. This change in calculation has resulted in a minor differential change between the two shortlisted options but does not change the rationale for the decision to confirm Option 4A as the preferred option.

**Table EC-ES 1 Shortlist Options Net Present Value – Southern Metro Area Elements Only**

| | Capital Costs | Renewal capital costs | Operating costs | Total |
|---|---|---|---|---|
| Option 2A | ($375.5 m) | ($9.1 m) | ($326.5 m | ($711.1 m) |
| Option 4A | ($341.5 m) | ($10.3 m) | ($314.4 m) | ($666.2 m) |

5 Capital Cost estimates for WWTP and Conveyance are estimated by Beca and are P50 AACE Class 5 cost estimate; expected accuracy of -30% to +50%. In addition, other costs including procurement, consenting, council resources, land acquisition have also been included and are provided by others.

6 Total dollars out to 2061 and unadjusted for inflation

## *Preferred Option*

The preferred option for the Southern Metro Area is a refinement of Option 4A. This was selected through assessments of the two short-listed options (Option 2A and 4A), risk and opportunity considerations and additional investigations.

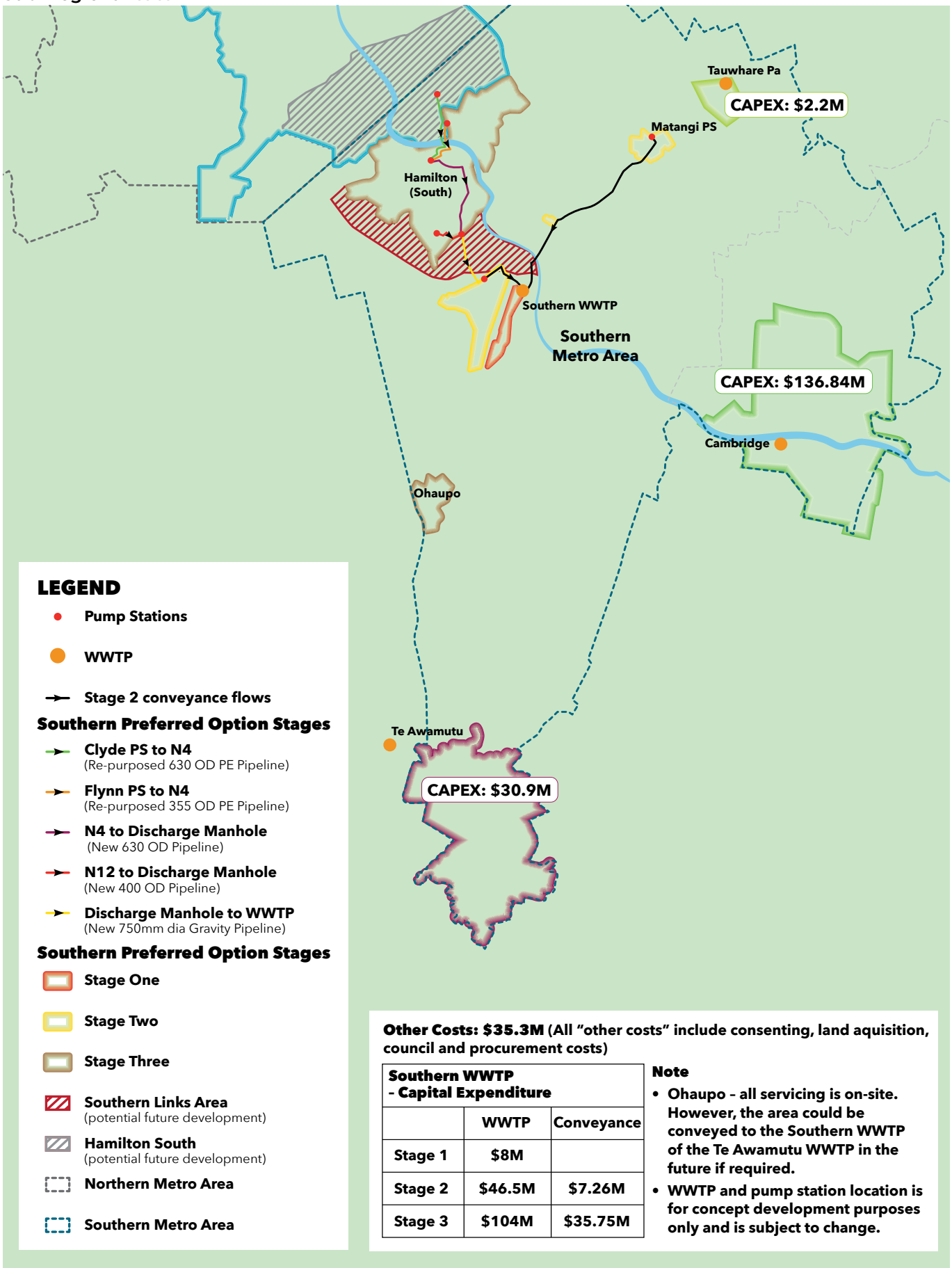
The two short-listed options for the Northern Metro Area (i.e. conveying all flows to an upgraded Pukete WWTP or upgrading both Ngaaruawaahia and Pukete WWTPs) will be evaluated and a preferred option identified as part of the Northern Metro DBC.

The preferred option for the Southern Metro Area consists of:

- The adoption of minimum treatment performance standards across all plants (refer to Section 5.3) over time.
- A new Southern Sub-Regional WWTP to service the airport area and environs, Mātangi/ Tamahere commercial area and southern Hamilton. Development of the plant will be staged to meet demand. Land discharge is proposed for Stage 1 with a move toward a discharge to water in Stage 2 and beyond as flows increase.
- The Southern Sub-Regional WWTP will be staged to meet the changing growth needs across Hamilton and the sub-region. The recommended site footprint for the Southern Sub-Regional WWTP provides for sufficient space to expand the plant to service a larger part of Hamilton in the future if required.
- Retaining and upgrading the Tauwhare Pā WWTP and land discharge to service local growth with the potential to be reticulated to the new Southern Sub-Regional WWTP or HCC network in the future if appropriate.
- A new WWTP at Cambridge with discharge to the Waikato River to meet the long-term needs of Cambridge.
- Retaining and upgrading the Te Awamutu WWTP to achieve improved treatment standards and cater for growth. Continued discharge via rock channel to the Mangapiko Stream is assumed.
- Improvements to the existing Mātangi WWTP until the wastewater is conveyed to the new Southern Sub-Regional WWTP in around 2040.
- Tamahere commercial hub to continue to utilise on-site wastewater treatment and discharge systems until 2040 when Mātangi is diverted to the Southern Sub-Regional WWTP.
- Ohaupo continuing with private on-site wastewater systems as there are no known environmental concerns with existing systems and only low-density, lifestyle-type development is expected.

An overview of the key features of the preferred option (i.e., indicative treatment plant locations and areas served) is shown on page 20. Specific details of the areas and population equivalents served by each plant are included on page 21.

Figure EC - ES 2: Preferred Option Overview – Key features and overview of staging of Southern Sub-Regional WWTP




**Other Costs: $35.3M** (All "other costs" include consenting, land aquisition, council and procurement costs)

| Southern WWTP - Capital Expenditure | | |
|---|---|---|
| | WWTP | Conveyance |
| Stage 1 | $8M | |
| Stage 2 | $46.5M | $7.26M |
| Stage 3 | $104M | $35.75M |

**Note**

- Ohaupo - all servicing is on-site. However, the area could be conveyed to the Southern WWTP of the Te Awamutu WWTP in the future if required.
- WWTP and pump station location is for concept development purposes only and is subject to change.

**Table EC-ES 2: Summary of Preferred Option WWTPs, Service Areas and Population Equivalents Served over time**

| WWTP | Locations served | Population equivalent serviced by capacity available at the following dates | | | | | Notes |
|---|---|---|---|---|---|---|---|
| | | 2031 | 2041 | 2051 | 2061 | Ultimate | |
| Mātangi WWTP | Mātangi Village | 150 | Transfer to Southern Sub-Regional WWTP | | | | |
| Tauwhare Pa WWTP | Tauwhare Pā | 619 | 619 | 619 | 619 | 889 | 2031 projection includes for additional 500 PE at Tauwhare Pā from current estimates. Ultimate includes allowance for Tauwhare Village (270 PE) |
| New Southern Sub-Regional WWTP | Airport area & environs | 4,000 | 6,000 | 17,852 | 17,852 | 17,852 | Assumptions are based on ~85 ha of developed dry industrial land being serviced at 2031; ~140 ha of dry industrial land being serviced at 2041. Assumptions includes for flows from wet industrial land use from 2051* |
| | Mātangi/ Tamahere | Existing stand-alone facility | 464 | 464 | 464 | 1,035 | Includes servicing Tamahere commercial area (does not include Tamahere residential area) |
| | Hamilton South: Hillcrest, Riverlea, Glenview, Peacocke. | Serviced through Pukete WWTP | | | 59,626 | 75,366 | DBC assumes diversion to new WWTP at 2061. Additional PE in 'ultimate' horizon is based on infill in these areas from 2020 Metro Spatial Plan. |
| | Southern Links Area | Not Serviced | | | | 35,000 | Ultimate forecast includes allowance for Southern Links |
| | Sub-Total | 4,000 | 6,464 | 18,316 | 77,942 | 129,253 | The Stage 3 WWTP can operate from 40,000 Population equivalent demand level |
| Cambridge WWTP | Cambridge | 32,940 | 37,801 | 42,892 | 45,031 | 57,649 | Assumptions includes flows associated with wet industrial activity to be generated from a small portion of land in Cambridge |
| Te Awamutu WWTP | Te Awamutu | 27,989 | 30,905 | 34,982 | 36,001 | 42,011 | |
| No WWTP | Ohaupo | Not serviced | | | | | All servicing is on-site. However, the area could be conveyed to Southern Sub-Regional WWTP or Te Awamutu in future if required. |

* Wet industrial flow assumptions based on 50 ha (~20% of airport industrial land) producing an addition 2 litres per second per hectare of wastewater flow.

Actual demand and timing of servicing for each area will likely vary from the assumptions used in the DBC. The triggers used to inform staging and implementation of the new plant will need refinement to reflect updates to the Hamilton and Metro Growth Strategies currently under review, and through more detailed assessment of network capacity constraints.

For example, the actual demand from the airport area and environs may be significantly lower than those used for the DBC which have assumed some wet industrial activity post 2051. The timing and extent of Hamilton (and other areas such as Southern Links) diverted to the new plant will likely vary from the assumptions used in the DBC. The diversion may occur much earlier than 2061 and the extent may vary based on growth, network and Pukete WWTP constraints.

It is recommended that demand assumptions are revisited and confirmed as part of implementing the new Southern Sub-Regional WWTP in the immediate to short term.

## Preferred Option Treatment Plant Performance Standards

The minimum treated wastewater quality standards adopted are very high. They are based on current best practice and delivering Best for River outcomes which include having a swimmable river that is safe for gathering kai. The minimum performance standards for all treatment plants are shown in the tables below.

**Table EC-ES 3: Minimum water quality standards for discharges to water**

| Parameter | Minimum Performance Standards for Discharges to Water |
|---|---|
| Total Nitrogen | Less than 4.0 milligrams per litre (as annual means) |
| Total Phosphorus | Less than 1.0 milligrams per litre (as annual means) |
| Escherichia coli (E.Coli) | Less than 14 cfu per 100 millilitres (as a 95th percentile) |
| | Noting that the future consents for any water based discharges will likely include specific daily limits on nutrient mass loadings (in units of kg/d rather than concentration limits in mg/l) for both summer and winter flow conditions . |

**Table EC-ES 4: Minimum water quality standards for discharges to ground**

| Parameter | Minimum Performance Standards For Discharges To Ground |
|---|---|
| Total Nitrogen | Less than 20 milligrams per litre (as annual means) |
| Total Phosphorus | No specific limit |
| Escherichia coli (E.Coli) | Less than 500 cfu per 100 millilitres (as a median) |
| | Noting that actual parameters will depend on nitrogen and phosphorus loads able to be sustinably discharged to land irrigation systems, and appropritae microbial parameter limits will be dependant on the method and location of discharge to ground. |

The treated wastewater quality standards would be introduced by 2031 or when the existing discharge resource consent for each WWTP plant expires. Achieving these targets may need to be staged within resource consents to provide sufficient time to upgrade and transition existing plants (i.e., Pukete WWTP) to meet these minimum standards.

During any resource consent process the form of the water quality standards will be further refined and may include ranges to take into account normal expected system variation and other location-specific factors. These refinements will not degrade the basis and/or adopt a lower water quality standard than that of the adopted standards for this DBC.

For the purpose of completing the DBC, assumptions have been made regarding discharge methods to be employed at each plant. Appropriate discharge methods will need to be considered and evaluated in detail as part of each Project to support resource consenting of any discharge activities.

To give effect to Te Ture Whaimana, alongside these quantitative minimum performance standards, further methods will be required to protect the mauri of the water and land from adverse effects. These requirements will need to be determined as part of implementing the Projects.

Appropriate management of solids from treatment processes is an important consideration in any treatment strategy. In line with the agreed treatment performance standards for the Southern Metro Area, solids management complexity, extent of solids destruction and energy potential realisation will increase in steps with population equivalent served.

Proposed provisions for atmospheric emissions are reasonably general but all would require best practice to be implemented.

In all process plant development, life cycle emissions will be given due consideration. It is anticipated that all three councils will consider The Climate Change Response (Zero Carbon) Amendment Act 2019 aspirations and optimisation of life cycle emissions generally. These will be drivers for initiatives, particularly in the larger plants, and for processes that drive the plants towards energy neutrality and emissions minimisation.

More detailed information is contained in the Wastewater Treatment Assumptions Memorandum[8] included in the Preferred Options Report (Appendix F).

8 Wastewater Treatment Assumptions for Waikato Metro Wastewater DBC, August 2020, included in Appendix F, Preferred Option Technical Report, September 2021.

## Preferred Option – Conceptualised Treatment Processes

The conceptualised treatment processes adopted for this DBC for the purpose of staging and cost estimating are outlined in Table EC-ES 5.

**Table EC-ES 5: Treatment Concept Development**

| Site | Population Equivalent (rounded) | Flow range ($m^3/d$) (rounded) | Liquid Processes | Solids Processes | Discharge |
|---|---|---|---|---|---|
| Mātangi WWTP | 150 | 30 | Local and communal septic tanks and recirculating sand filter (until 2040). UV if there is a risk of bypass flow | Periodic clean out of septic tanks | Sub-surface drip irrigation to land (until 2040) |
| Tauwhare Pā WWTP | 275 | 55 | Package secondary treatment with land disposal | Periodic clean out of septic tanks | Sub-surface drip irrigation to land |
| Southern sub-regional WWTP Stage 1 | 2,000-5,000 | 400–1,000 | SBR | Transfer thickened sludge to Pukete or Cambridge WWTP | Sub-surface drip irrigation to land |
| Southern sub-regional WWTP Stage 2 | 5,000-18,000 | 1,000-3,600 | Secondary BNR reactor<br>Membrane separation<br>UV | Screw press dewatering | Discharge to water, wetland restoration and/or reuse. Stage 1 land discharge could continue for part of flow |
| Southern sub-regional WWTP Stage 3 | 78,000 | – 15,500+ | Primary sedimentation<br>Secondary BNR reactor<br>Membrane separation<br>UV Disinfection<br>Centrate Treatment | Digester<br>centrifuge dewatering | Discharge to water, restoration, or reuse.<br>Stage 1 land discharge could continue for part of flow |
| Cambridge WWTP | 25,000-45,000 | 5,000-9,000 | Primary sedimentation<br>Secondary BNR reactor<br>Membrane separation<br>UV Disinfection<br>Centrate Treatment<br>Installation of primary sedimentation and digesters could be delayed with extra reactor capacity required | Digester<br>centrifuge dewatering | Discharge to water, restoration or reuse. |
| Te Awamutu WWTP | 20,000-36,000 | 4,000-7,200 | Reactor<br>Clarifiers<br>UV | Filter Press (existing) | Discharge to water via rock filter |

9 WWTP at this stage can operate up to 40,000 Population equivalent demand level, however, DBC demand projections for Southern Sub-Regional WWTP prior to Hamilton South being connected reach a maximum of 18,000 PE.

10 WWTP at this stage can operate from 40,000 Population equivalent demand level, however DBC assumes that all of the Hamilton South area (Hillcrest, Glenview, Peacocke) will be diverted at the same time in 2061.

11 This WWTP can be upgraded further by adding additional process units such as reactors and membrane systems as needed to service additional growth post 2061.

12 The solids stream management ultimately chosen for this population and beyond is likely to be heavily influenced by that ultimately selected for Pukete WWTP.

## Wastewater Discharges

A range of discharge options have been identified and are included in the Shortlist Options Report (Appendix E). For the purpose of this DBC, assumptions have been made regarding discharge methods to be employed at each plant. Appropriate discharge methods will need to be considered and evaluated in detail as part of each Project to support resource consenting of any discharge activities.

## Southern Wastewater Treatment Plant: Staging and Key Considerations

Staged development of the Southern Sub-Regional WWTP is a key element of the preferred option. The proposed capacity of Stage 1 is based on the extent of land currently developed or consented in and around the Airport. It is proposed to be operational in Year 5 (2026) to:

- Avoid investment in short-term servicing solutions that do not achieve the agreed investment objectives, including many packaged treatment plants, or storage and tankering options that do not provide long-term sustainable solutions[13].
- Provide certainty for land use planning and development.
- Provide for wastewater reticulation and conveyance systems in and around the Airport that support land development and are compatible with the medium to long-term wastewater servicing solution for the Waikato Metro Area.
- A new site and WWTP offers the opportunity to masterplan an operationally efficient treatment facility future proofed to provide for growth and future demands. A buffer area around the WWTP will be required to mitigate potential visual, odour and noise issues.

Stage 2 upgrades will be triggered by growth. The upgrades are currently based on servicing further land developed around the airport area and environs and surrounding communities (including Mātangi), plus the need for improved treatment and alternative discharge methods. Stage 2 provides for an interim upgrade to provide for wet industrial activity at around 2051. This stage could equally service demand from other areas such as Hamilton South and the broader environs. But for the purpose of this DBC, it is assumed demand will arise from wet industrial activity.

Stage 3 represents a step change in capacity and treatment processes to service Hamilton South. Timing of Hamilton South diversion is based on an assessment of build-out capacity of the Pukete WWTP site. (Refer Section 4.1.1 for details).

However, the timing of the diversion may be required earlier than assumed, due to conveyance network constraints and/or growth occurring at a greater rate than assumed.

Further upgrades will be required as flows increase, for example, if Southern Links areas develop.

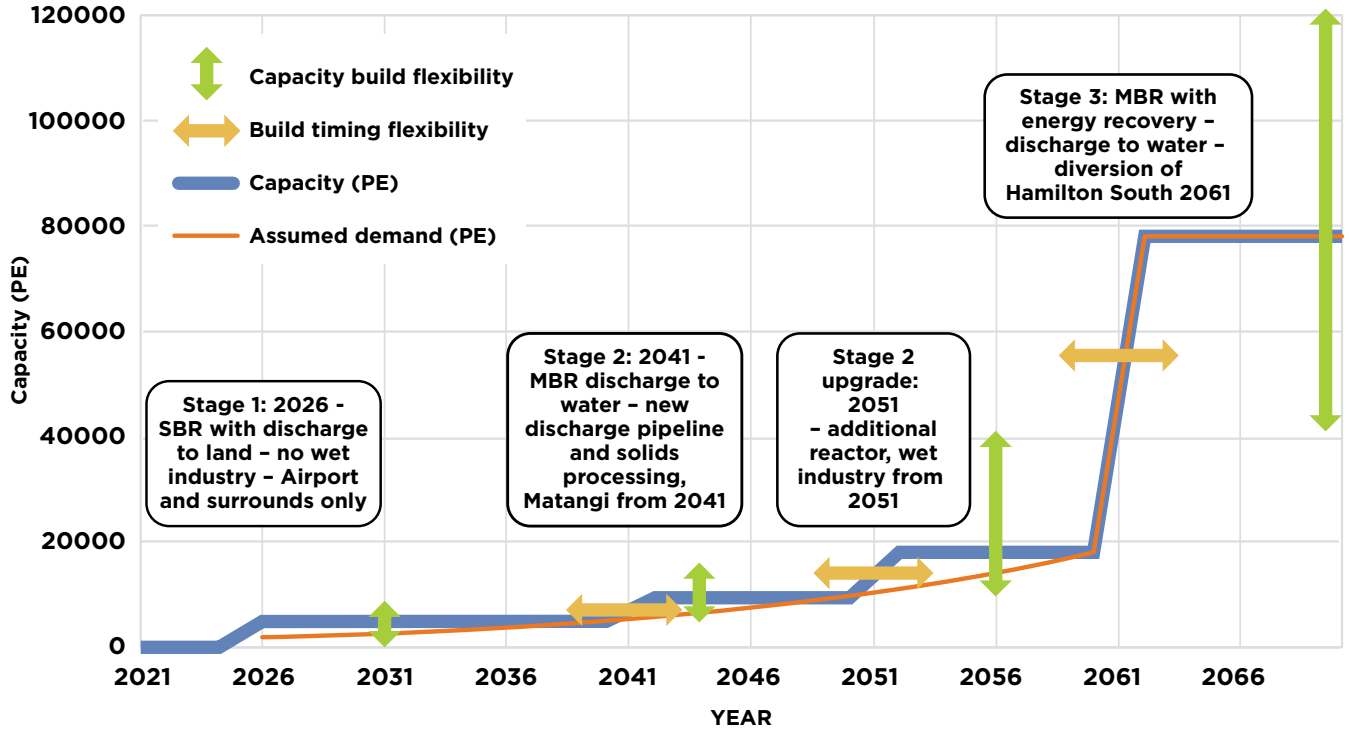
A summary of Southern Sub-Regional WWTP staging is provided in Table EC-ES 5 above, Table EC-ES 6 and illustrated in Figure EC - ES 3 below. Servicing catchments and conveyance is also detailed further below in  and Figure EC - ES 5.

13 A proliferation of private package treatment plants does not align with the project investment objectives, is expected to deliver poorer treatment standards and performance overtime; and likely increase the capital and operating costs in the long term as package plants would not contribute toward the broader servicing needs of the Metro Area.

**Table EC-ES 6: Southern Sub-Regional Treatment Concept Staging**

| | Description | Assumed Areas Served | Total Stage Built Capacity | Capital Cost Estimate | Starting Demand |
|---|---|---|---|---|---|
| **Stage 1** | | | | | |
| Year 1-3 2022-2024 | Pre-Implementation: Land acquisition, designation, consenting, master planning | Land and designation assumed to serve all stages and provide sufficient space for further expansion beyond Stage 3 | | $20 m | |
| Year 3-5 2024-2026 | WWTP: SBR with discharge to land including procurement and Council overheads and land discharge extension | Airport precinct (no allowance for wet industry) | 1,000 $m^3$/day (5000 PE) | $9.9 m | 400 $m^3$/day (2,000 PE) |
| **Stage 2** | | | | | |
| Year 19-21 2040-2042 | WWTP & Discharge: MBR with discharge to Waikato River. Includes conveyance from Mātangi to plant, outfall pipeline and structure to river, operator building, sludge dewatering facility. | Airport area and environs (excluding wet industry) and Mātangi/ Tamahere Commercial areas | 1,900 $m^3$/day (9500 PE) | $39.6 m assumes all Stage 1 plant can be reused | 1,200 $m^3$/day (6,000 PE) |
| Year 29-31 2050-2052 | WWTP Upgrade: Additional reactors and membrane equipment | Airport area and environs, wet industry and Mātangi/ Tamahere Commercial areas | 3,600 $m^3$/day (18,000 PE) | $16.5 m | 3,600 $m^3$/day (18,000 PE) |
| **Stage 3** | | | | | |
| Year 39-41 2060-2062 | WWTP: MBR with Energy Recovery (Primary Sedimentation and Digestion) with discharge to Waikato River. Includes conveyance from Southern Hamilton, major increase in treatment capacity. | Airport area and environs (with wet industry), Mātangi/ Tamahere Commercial, Southern Hamilton | 15,600 $m^3$/day (78,000 PE) | $150.15 m (assumes 60% Stage 2 plant can be reused) | 15,600 $m^3$/day |

Figure EC - ES 3: Southern Sub-Regional WWTP Staging and Capacity (Population Equivalents)




## Conveyance

The Preferred Option includes conveyance infrastructure to connect current and future reticulation networks to the Southern Sub-Regional treatment facility. The terminal pumping systems (pump stations and rising mains) from the service areas to WWTP are included.

The costs associated with local or trunk network upgrades or diversions to convey wastewater to the terminal conveyance systems are not included in the financial assessments of the preferred option.

Costs of network upgrades needed to service growth within each city/community have not been included either as, in most cases, investment in upgrading the existing conveyance networks would be required regardless of the wastewater treatment solution.

As the assumed Stage 1 service area (located at the Airport) is near the assumed location of the Southern Sub-Regional WWTP, no strategic conveyance costs have been included for Stage 1. The cost of local reticulation and trunk conveyance infrastructure needed to service the Stage 1 area would sit with developers, not councils.

The assumed Stage 2 service area is shown in Figure EC - ES 4. The Stage 2 conveyance includes the terminal conveyance system from Mātangi to the Southern Sub-regional WWTP. A new pump station at Mātangi discharging into a 9.7 km 200 OD PE pressure main to the new Southern Sub-Regional WWTP is also included.

Figure EC - ES 4: Stage 1 & 2 Service Areas and Stage 2 Conveyance details

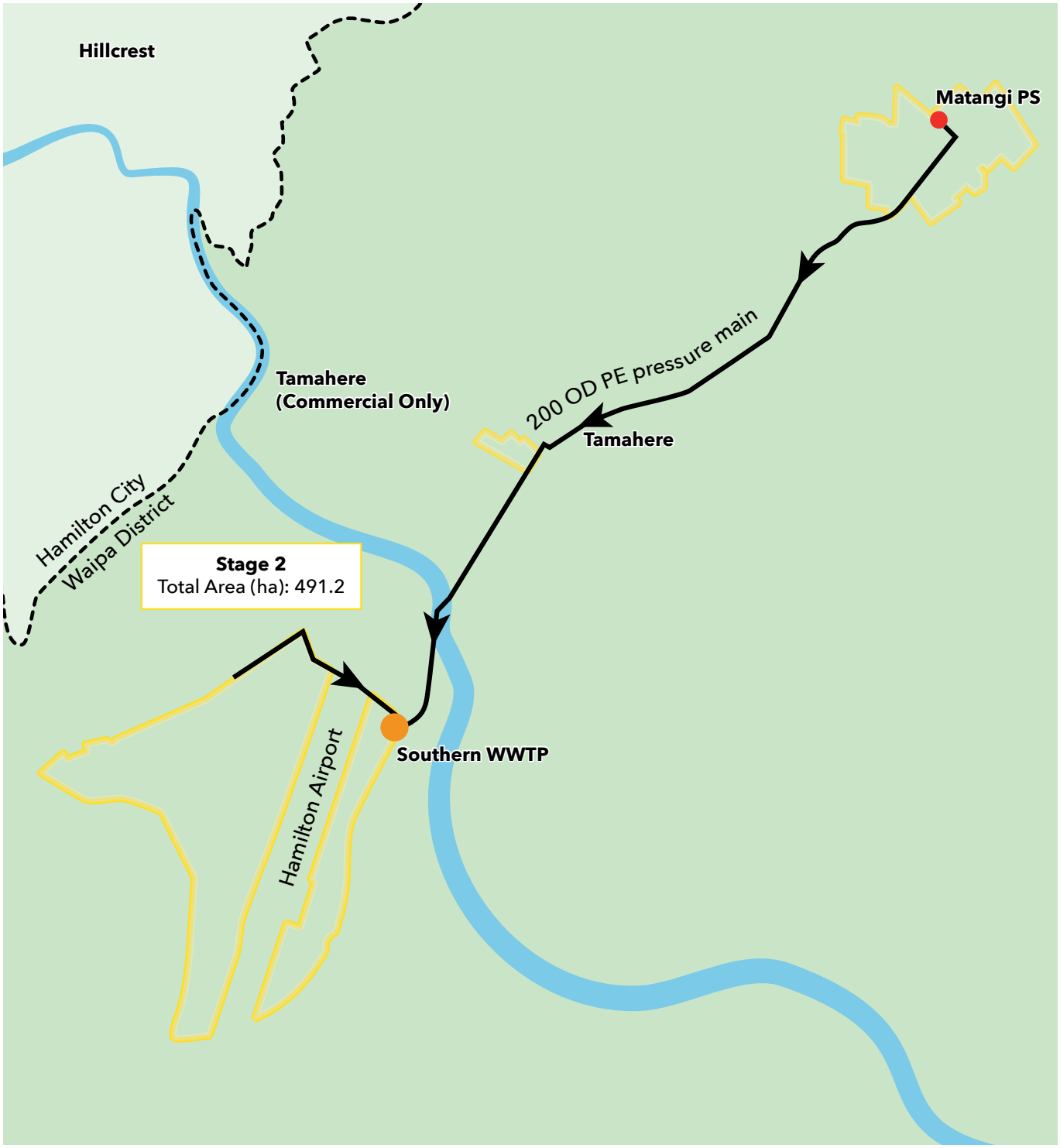
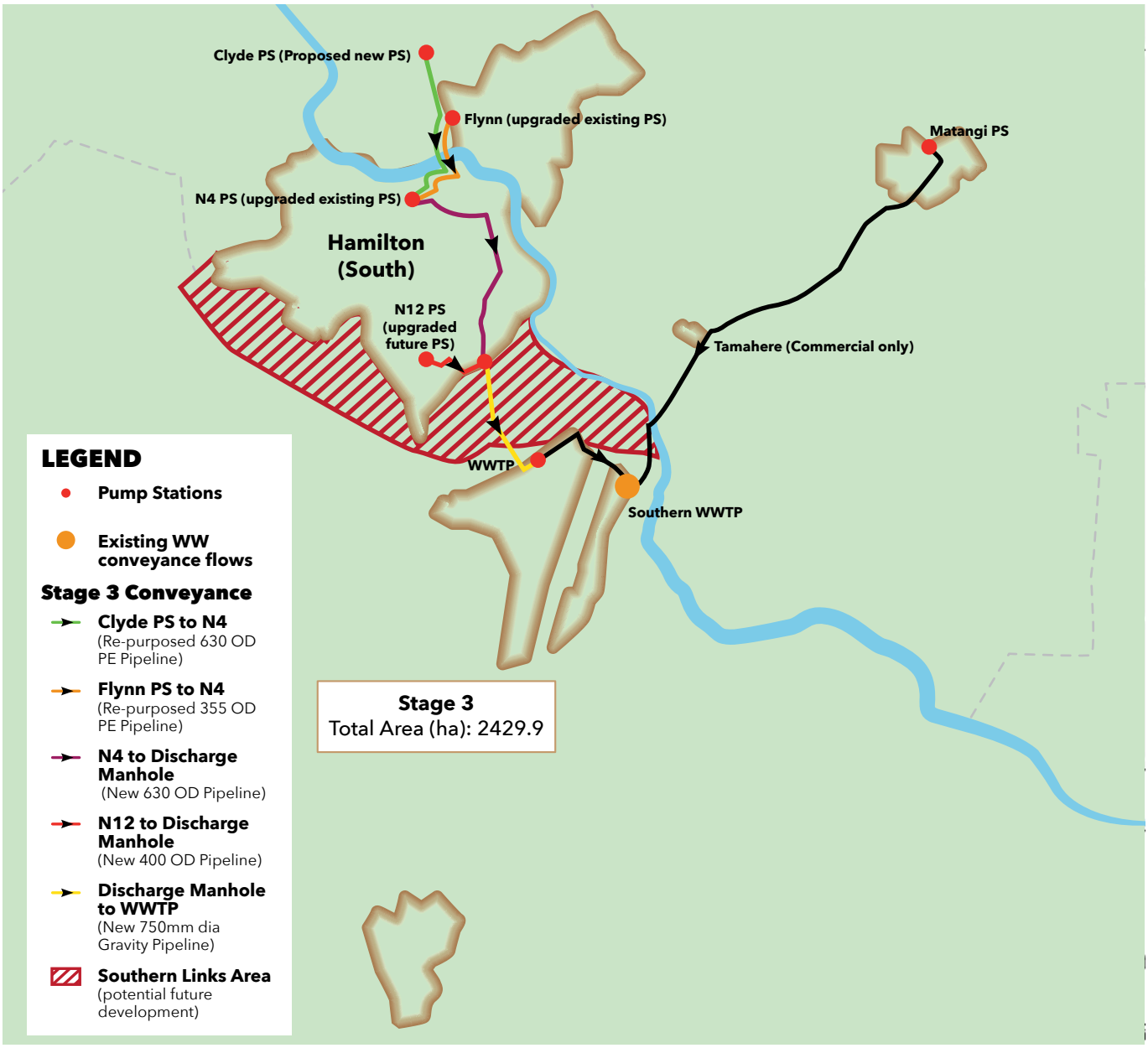


Figure EC - ES 5: Stage 1, 2 and 3 Service Areas and Stage 3 Conveyance details




The assumed Stage 3 service area is shown in Stage 1, 2 and 3 Service Areas and Stage 3 Conveyance details. The Stage 3 conveyance system includes a new pump station at Clyde Street and an upgraded Flynn pump station utilising the Peacocke rising mains in reverse. Both pump stations would pump to the N4 pump station in the Peacocke growth cell. The N4 and N12 pump stations would divert flow through (new or repurposed) pressure mains to the Southern Sub-Regional WWTP. Several local and trunk pump station upgrades and diversions will be necessary to divert the full extent of Stage 3 Hamilton South Area, however these have not been included in this DBC.

For this purpose of this DBC diversion of Hamilton South is assumed to occur in 2061. Several factors will influence the actual timing of the Hamilton South diversion, including the cost of upgrading the Hamilton strategic wastewater network and Pukete plant, versus the cost of conveyance and upgrades to the Southern Sub-Regional WWTP, and the rate and scale of growth in and around Hamilton.

Some initial conveyance concepts for the Southern Links area have also been developed which link in with the conveyance concept for the Peacocke area. The costs of conveyance and plant upgrades to service other parts of Hamilton not outlined above and/or Southern Links area are not included in the financial assessments of the preferred option.

The cost of local reticulation and trunk conveyance infrastructure (such as that needed to service the Airport Industrial Precinct or service development in brownfields areas) have not been included in this DBC. These costs are assumed to sit with developers or the relevant Council.

The cost of network upgrades needed to service growth within each city/community have not been included in this DBC as, in most cases, investment in upgrading the existing conveyance networks would be required regardless of the wastewater treatment solution.

## Cambridge WWTP

The new Cambridge WWTP can also be staged. Additional screens, reactors, primary sedimentation tanks and digestors can be added over time in response to residential and industrial growth. Primary sedimentation and digestion processes could be added post-2050 when flows are higher. However, this would require more reactor capacity and result in less energy recovery.

Treatment plant development would need to provide both horizontal and vertical spaces for the process units to be added subsequent to the initial phase of development. Initial process configuration would need to allow vertical and horizontal spaces for the future introduction of primary sedimentation tanks.

## Nutrient Summary

The following information is summarised from the technical note Wastewater Baseline and Future Nutrient Loads for Waikato Southern Metro Wastewater DBC (Appendix G).

Calculation and comparison of future predicted nutrient (Total Nitrogen (TN) and Total Phosphorus (TP)) mass loads against the baseline nutrient loads from the existing treated wastewater discharges for the Southern Metro Area, has been undertaken. This is to analyse whether the proposed level of wastewater treatment, and associated discharges, will meet the various policy and statutory requirements around improving the health and wellbeing of the river. Calculations in particular aim to ascertain whether the proposed future discharges (which will likely see an increase in volume discharged) will deliver a reduction in the total nutrient loads discharged compared to the baseline nutrient loads.

The predicted mass loads from the proposed new Southern Sub-Regional WWTP and the upgraded Cambridge WWTP were considered individually and in combination with each other, and in combination with other Metro WWTP discharges.

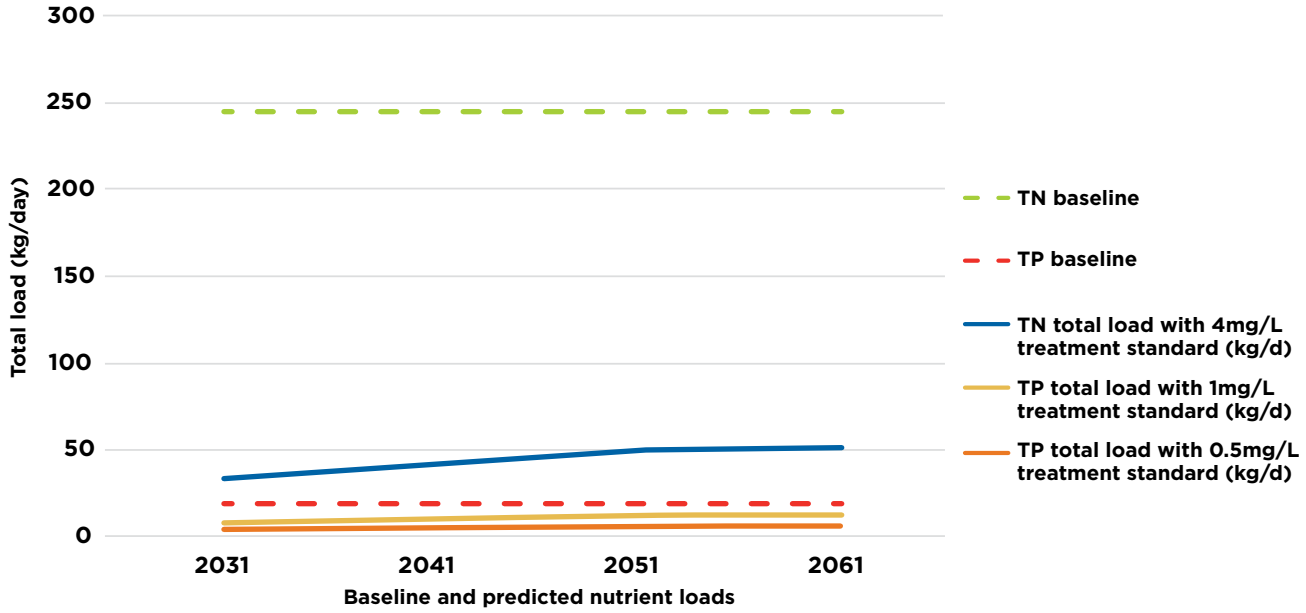
When considered alone, the new Southern Sub-Regional WWTP will exceed the TN and TP mass load baseline. This is because it is a new WWTP and discharges into a largely greenfield environment. Wastewater generated by the few existing industrial sites in the vicinity is either discharged to land or trucked offsite (mostly to Cambridge WWTP). Any growth and the associated wastewater discharge would be considered against a very low existing baseline.

The existing baseline for TN is 1 kg/day and <1 kg/day for TP, and this is associated with the current discharge to land from the Mātangi WWTP (noting these flows will be re-directed to the new Southern Sub-Regional WWTP once operational).

Taking a combined view of future mass loads is considered reasonable, given that wastewater generated by a few of the existing airport industrial sites is already trucked offsite to the Cambridge WWTP. If there was no Southern Sub-Regional WWTP, the additional flow and load to be served by the plant would likely be conveyed to either Pukete or Cambridge to be treated and discharged.

As shown below, when the Cambridge WWTP and new Southern Sub-Regional WWTP are looked at together, future nutrient loads are substantially less than existing. This is likely to be consistent with policy and statutory requirements around improving the health and wellbeing and water quality of the Waikato River.

**Figure EC - ES 6: Baseline and Predicted Nutrient Loads for the Cambridge WWTP and Southern Sub-Regional WWTP combined**




In addition to employing high treatment standards, investment in restoration may also be required Best for River outcomes. This could be achieved in a number of ways, including by planting erosion prone land and undertaking riparian planting. This would need to be worked through with partners and stakeholders including Tangata Whenua.

If the Cambridge WWTP and the proposed new Southern Sub-Regional WWTP were not considered together for consenting purposes, offsetting would likely be required due to the very low nutrient mass load baselines.

## Risks

The following are the key risks (refer to Management Case – Section 1.5 for additional detail including mitigations) for this project:

- **The recommended DBC projects cannot be funded.** This could lead to project being delayed, not proceeding or lower standards being adopted as a result of financial constraints; capital cost increases; and/or, poor integration, coordination and planning.
- **Costs to implement are significantly higher than estimates.** This could further impact on affordability and lead to the project being delayed, not proceeding or lower standards being adopted as a result of increased market (resources and materials) costs due to demand, supply chain issues or poor risk allocation in construction contracts.
- **The recommended projects do not meet partner expectations.** This may impact ability to implement the projects; adversely impact relationships and result in a failure to deliver 'best for river' outcomes.
- **Resource consents and designations for the recommended option cannot be secured** or the costs to deliver a consentable solution and to secure designations are prohibitive.
- **Three Waters reform impacts the ability or commitment to implement the projects:** While the DBC has been prepared on the basis of 'business as usual' (BAU) water services delivery, three waters reforms could result in the projects being deferred, delayed or not occurring in the timeframes required. This situation could arise as a result of the transition phase, delays in decision making, changes in key 'actors' involved in delivery, and changing investment priorities. A delay in implementing Stage 1 of the Southern Sub-Regional WWTP will result in a proliferation of on-site private solutions, undermining the long-term investment in the Southern Sub-Regional WWTP. Conversely, reforms may provide a stronger financial position to support project implementation than BAU.
- **Inability for councils to move to an integrated delivery programme.** Would result in uncoordinated delivery of the overall programme; misalignment of objectives and 'Best for River' principles.

## Technical Risks

The technical risks relating to the Preferred Option include:

- Delay in Stage 1 delivery for Southern Sub-Regional WWTP impacting on project viability in the medium term and resulting in in inefficient infrastructure investment. Southern Sub-Regional WWTP site and conveyance corridors not protected resulting in increased costs and project delays.
- Changes in rate of growth or wastewater composition compared to assumptions resulting in lack of or excess servicing capacity. The impacts could include limits on growth or financial burden of under-utilised assets.
- Limited options for biosolids reuse/disposal resulting in increased operating cost, lost opportunities for resource recovery and/or Increased greenhouse gas emissions.
- Increased costs associated with Greenhouse gas emissions as a result of legislative change (introduction of carbon taxes/levies); Liquid and solids discharge concerns trump concerns around greenhouse gas emissions Reluctance to invest in energy recovery technology of energy, chemicals and biosolids disposal.

## Recommended Investigation and Design

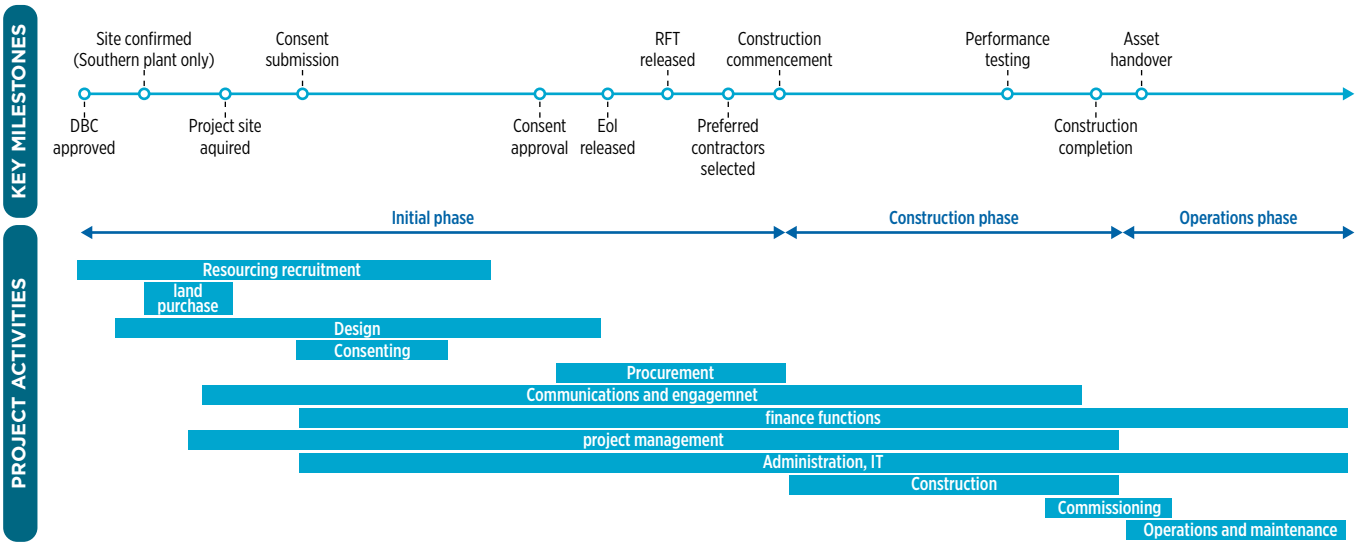
To implement the preferred option, further investigation and design is recommended as follows:

- Confirming location and securing tenure for the Southern Sub-Regional WWTP site and discharge locations.
- Geotechnical investigations for the Southern Sub-Regional WWTP.
- Master Planning, designations and consenting for the Cambridge and Southern Sub-Regional WWTPs s and discharges .
- Preliminary design of the wastewater treatment and discharge facilities.
- Review of redundancy requirements for major process units (e.g. screens and reactors).
- Investigation of biosolids reuse and disposal options.
- Further investigation of sustainability and capital/operational carbon footprint.
- Further refinement of capital, operational and present value analysis.

A detailed breakdown of proposed project activities to deliver the Southern Sub-Regional WWTP and discharge is shown below and provided in the Management Case (Section 1.2.4).

Project activities to deliver the Cambridge WWTP and discharge are being developed separately by Waipā DC as part of the Cambridge WWTP Project and are not repeated in this DBC.

**Figure EC - ES 7: Proposed Southern Sub-Regional Wastewater Treatment Plant Project Activities (Management Case – Section 1.2.4) 1.6.10**



## Cost Estimates

Cost estimates representing capital and operating requirements to 2061 were prepared by BECA to establish the order of magnitude capital and operational costs for the preferred option. They are P50 cost estimates and include a 20-30% risk allowance on the capital costs. P95 estimates have also been prepared and are included in Appendix B of the Preferred Option Report (Appendix F). An allowance of 10% for procurement and Council overhead costs has been added to the capital cost estimates for inclusion in the economic and financial cases. Refer to section 8 of the appended Preferred Option Report for a detailed breakdown of the costs).

The cost estimates are deemed to be Class 5 estimates as per the AACE14 Cost Estimate Classification System and have an expected accuracy range of -30%/+50%. The estimates are developed as part of the DBC to provide early estimates for inclusion in budgeting and funding applications for implementation funding. They will need to be refined once a detailed design is developed.

The capital and operational costs for the Southern Sub-Regional WWTP are shown in the following Capital Cost Estimate Breakdown tables (stages 1, 2, and 3). Costs for the other WWTPs are shown in the Preferred Option Cost Summary (un-escalated and excluding Southern Sub-Regional WWTP) table. The costs are also outlined in the Financial Case, which provides additional information regarding cashflows and specific timing for expenditure.

The Financial Case provides analysis of the financial implications for the delivery of the preferred option including capital, operational, land purchase and procurement and construction overheads based on Council estimates.

**Table EC-ES 7: Stage 1 Southern Sub-Regional WWTP Capital Cost Estimate Breakdown (2026)**

| Item | Cost (2020 values) |
|---|---|
| **Land Acquisition**<br>Assumes adequate land for Stage 1, 2 and 3 WWTP development | $12 m |
| **Master planning and consents**<br>This includes consenting for land and water discharge for Stage 1 and 2 and includes master planning, designation and consents for the treatment and discharge facilities. | $8 m |
| **2026 Wastewater Treatment Plant & Discharge System** | |
| Design, ground improvements and initial civil work | $1 m |
| Land disposal system: part – irrigation (sub-surface drip irrigation on approximately 10 ha) | $1 m |
| SBR reactors, screens, mechanical and electrical equipment | $6 m |
| **2026 WWTP & Discharge (Capital Costs) Sub-Total:** | $8 m |
| **2026 WWTP Procurement & Council Overheads**<br>Allowance of 10% of capital costs for procurement and Council overhead costs (as per the Financial Case | $0.8 m |
| **Other Stage 1 Costs**<br>– extend the irrigation equipment and system (assumes use of land acquired in Stage 1) | $1.1 m |
| **Total – Capital Expenditure** | **$29.9 m** |
| **Annual Operational Costs** | **$0.544 m** |

**Table EC-ES 8: Stage 2 Capital Cost Estimate Breakdown (2041 and 2051)**

| Item | Cost (2020 values) |
|---|---|
| **2041 Wastewater Treatment Plant & Discharge System** | |
| Outfall: 1 km pipeline plus discharge structure (assumed gravity flow) | $4.5 m |
| Treatment Plant including screens, membranes, UV system, mechanical and electrical equipment, and pipework | $19.5 m |
| Civil works and buildings | $6 m |
| **2041 WWTP & Discharge (Capital Costs) Sub–Total:** | $30 m |
| **2041 Procurement & Council Overheads**<br>Allowance of 10% for procurement and Council overhead costs (as per the Financial Case) | $3 m |
| **2041 Mātangi Conveyance Costs**<br>includes allowance of 10% for procurement and Council overhead costs (as per the Financial Case) | $7.26 m |
| **2051 WWTP (Capital Costs) Sub-Total**<br>Additional reactors, membranes, screens and aeration system (2051) – includes allowance of 10% for procurement and Council overhead costs (as per the Financial Case) | $16.5 m |
| **Total – Stage 2 Capital Expenditure** | **$56.76 m** |
| **Annual Operational Costs WWTP** | $0.672 m - $2.05 m |
| **Annual Operational Costs Matangi Conveyance** | $0.102 m |

Note: Consent approvals and cost assumed to be covered under stage 1

The Stage 2 plant costings assume that all Stage 1 plant can be reused.

While the key tankage at the WWTP will already be in place, additional costs will include:

- Provision of trunk infrastructure (including pipes and channels) on site for large future flows.
- Grit removal and second stage screening.
- Upgraded aeration system.
- Upgraded UV system.
- Dewatering facility.
- Reconfiguration work.
- Membrane trains and associated plant and plant room.
- Operator facilities.

Stage 2 also assumes that a treated water discharge to the Waikato River will be required and includes a new outfall pipeline to the river and a new outfall structure. The outfall cost estimates are based a 1 km long gravity discharge pipeline from the WWTP to the river. This length is assumed as the WWTP site and discharge location are yet to be determined.

Approximately 40% of the initial Stage 2 cost is associated with the outfall and dewatering facility.

Table EC-ES 9: Stage 3 Capital Cost Estimate Breakdown (2061)

| Item | Cost (2020 values) |
|---|---|
| **2061 Wastewater Treatment Plant & Discharge Systems** | |
| Structural and civil works | $48 m |
| Mechanical and electrical equipment | $48 m |
| Upgrade capacity outfall pipeline and structure | $8 m |
| **2061 WWTP & Discharge (Capital Costs) Sub–Total** | $104 m |
| **2061 Procurement & Council Overheads**<br>Allowance of 10% for procurement and Council overhead costs (as per the Financial Case) | $10.4 m |
| **2061 Hamilton South Conveyance Costs**<br>Conveyance for Hamilton South includes allowance of 10% for procurement and Council overhead costs (as per the Financial Case) – does not include servicing the area between the Southern Links designation and existing Hamilton City boundary | $35.75 m |
| **Total – Stage 3 Capital Expenditure** | **$150.15 m** |
| **Annual WWTP Operational Costs** | $7.44 m |
| **Annual Matangi Conveyance Operational Costs** | $0.102 m |
| **Annual Hamilton South Conveyance Operational Costs** | $0.8 m |

Note: Consenting costs relating to Stage 3 have not been included for the purposes of financial modelling. The consent approval process required at that time (c2055-2060) is unknown. Approval for a significant increase in discharge volume will be required.

Cost estimates to upgrade other wastewater treatment facilities in the Southern Metro Area are included in Table EC-ES 10. The assumptions and staging applied to each of these facilities are detailed in the Preferred Option Technical Report and Section 5.9.

**Table EC-ES 10: Preferred Option Cost Summary (un-escalated and excluding Southern Sub-Regional WWTP)**

| WWTP name | WWTP Capital Cost ($ m) up to 2061 – includes allowance of 10% for procurement and Council overhead costs (as per the Financial Case) | Operational Cost @ 2061 ($/year) |
|---|---|---|
| **Cambridge** | $ 136.84 m | $2.8 m |
| **Matangi** | $ 0.55 m (short term improvements) | Matangi is assumed to be serviced by the Southern Sub-Regional WWTP from Stage 2 (2041) |
| **Te Awamutu** | $30.9 m | $4.0 m |
| **Tauwhare Pa** | $ 2.2 m | $0.04 m |

Estimates for Cambridge are based on achieving the treatment quality standards agreed through this DBC project.

Estimates for Te Awamutu are based on the funding included in the Waipa District Council 2021–2031 Long Term Plan (LTP) and provisional estimates of the costs of further upgrades. These estimates do not reflect the level of investment likely to be required and is unlikely to achieve the treatment standards agreed through this DBC. The costs associated with achieving the agreed standards will need to be evaluated as part of future Te Awamutu WWTP consenting and upgrade projects.

Over time the total operational costs increase as flows increase. Large plants with PSTs and digesters (i.e. Cambridge WWTP) have significantly lower relative operating costs due to energy recovery and reduced biosolids volumes for disposal. The technology associated with the addition of primary sedimentation (PST), digestion and energy recovery increase the capital cost of a treatment plant development or plant upgrade.

However, a choice to delay the installation of PSTs and digesters at the Cambridge plant would increase operational costs. Any decision on delaying energy recovery facilities should take into account the whole-of-life cost implications.

## Implementation Plan

The implementation plan is summarised in Figure EC-ES 1 below. Triggers have been identified to move between development stages. The Southern Sub-Regional WWTP development stages are triggered by local (Airport area and environs), Mātangi or Hamilton demand. Mātangi conveyance and Cambridge and Te Awamutu WWTP upgrades are triggered by growth and new resource consent requirements. Developer agreements will trigger the need to upgrade at Tauwhare Pā WWTP. Servicing of Ohaupo would be triggered by environmental issues with current on-site wastewater systems or significant increased demand due to higher density development.

Key implementation steps to implement a new Southern Sub-Regional WWTP involve:

### Stage 1 – Pre-implementation

- Develop an understanding of the existing and short-term flows that will need to be managed before Stage 1 is operational. Coordination with the airport and other developers to develop a servicing concept and input into master plans for developments.
- Entering into funding agreements for pre-implementation activities and land acquisition.
- Securing land for the plant, buffers and Stage 1 land discharge. The total site area will be large enough to cater for future plant expansion.
- Master planning of the site to support staged plant development.
- Designating and consenting the treatment plant and discharge activities (Stages 1 and 2)
- Entering into funding agreements for Stage 1 of the plant.

### Stage 1

Commencing Stage 1 of the treatment plant development. SBR treatment technology with land disposal is proposed for the first stage. This technology provides enormous flexibility in terms of flows and load and will provide effluent quality suitable for application into or onto land. The first stage would cater for between 400 m3/day and up to 1,000 m3/day (but with some flexibility). Soils will need to be suitable for low-rate irrigation year round.

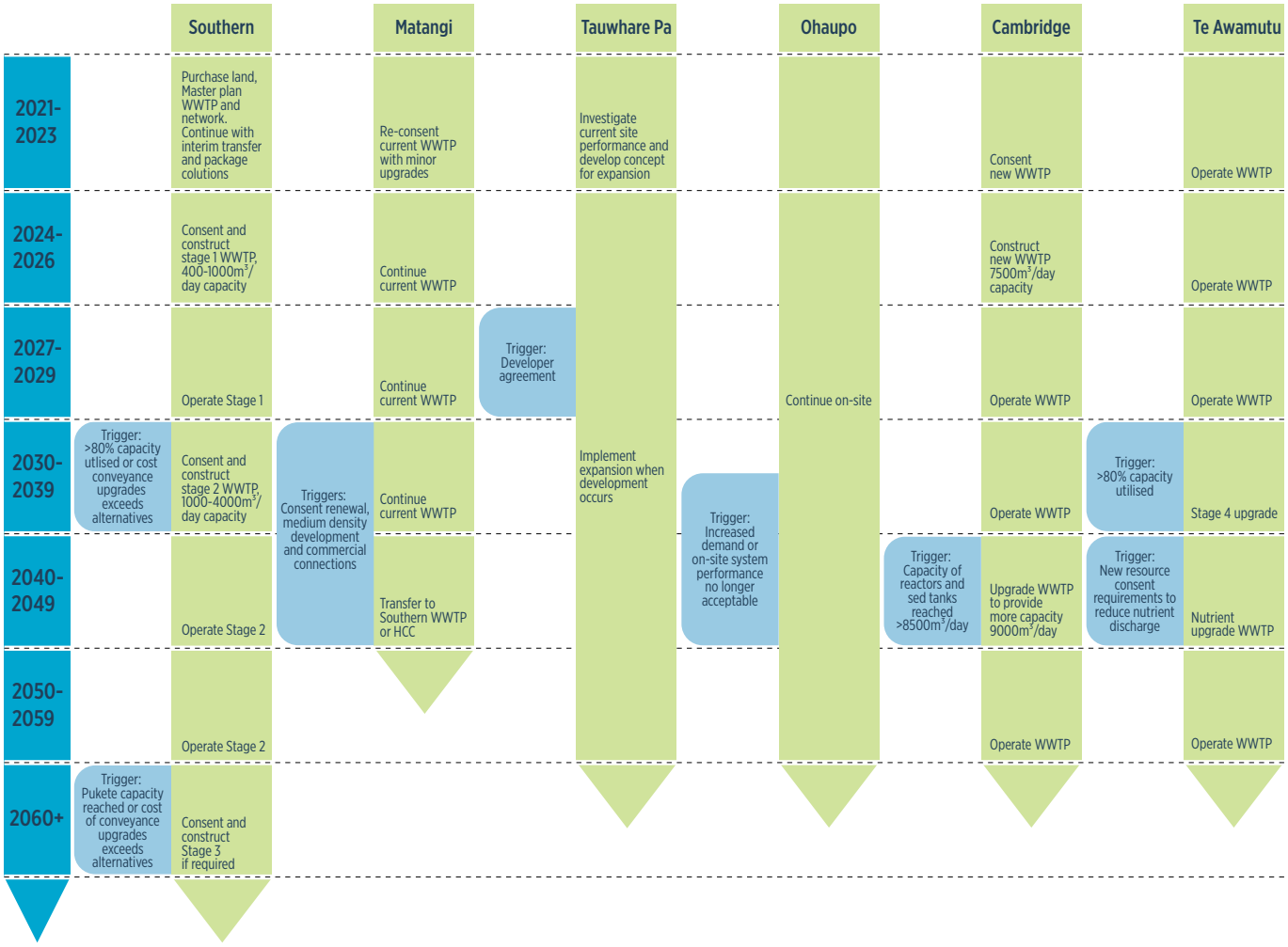
### Stage 2

When the demand to the Stage 1 plant nears 1,000 $m^3$/day the plant would be upgraded to an MBR system and likely require a discharge to water. There is the potential for all or part of the Stage 1 land disposal system to continue to be used in parallel. The MBR system could be configured using the Stage 1 SBR reactor tanks, much like the conversion of the Pukekohe WWTP from SBR to MBR configuration. This system will be upgraded to meet demand given local demand is expected to be 3,600 m3/day by 2061. If servicing of parts of the Southern links or Peacocke catchments was desired, the Stage 2 plant could potentially be upgraded to 8,000 $m^3$/day capacity. The MBR technology would also open up opportunities for re-use of treated wastewater by selected industries.

### Stage 3

The Stage 3 Treatment Plant upgrade provides additional capacity to service Hamilton South and allows for enhanced energy and resource recovery. Further system upgrades would be undertaken to meet demand.

## Figure EC-ES 1: Preferred option implementation plan



# Commercial Case

## He Keehi tauhokohoko – haha ratonga me te whai kirimana

### *Introduction*

This document sets out the Commercial Case for the Waikato Southern Metro Wastewater Treatment Detailed Business Case (DBC).

The purpose of the Commercial Case is to demonstrate the preferred option will result in a viable procurement and a well-structured deal between the public sector and its service providers.

The Commercial Case considers the approach to packaging and contracting options, the procurement plan, potential for risk sharing and the planned contractual arrangements.

### *Project Definition*

The preferred option comprises a programme (the Programme) of wastewater treatment plant (WWTP) and conveyance works across the wider Waikato-Hamilton Waipā Metro Area (the Projects). The Projects are outlined below:

- **Southern Sub-regional WWTP (Southern WWTP):** Construction of a new WWTP to service the Waikato Regional Airport (the Airport) industrial precinct, Mātangi/Tamahere Hub and southern Hamilton. The WWTP is expected to be located between Rukuhia and the Airport and will be delivered in three stages to align to the estimated demand. Initially, the WWTP will discharge to land, but will discharge to water and ultimately into the Waikato River once stage two triggers are reached.
- **Cambridge WWTP:** Construction of a new WWTP at Cambridge with discharge to the Waikato River to replace the existing plant. The plant will be located on the same site as the existing plant.
- **Te Awamutu upgrades:** Upgrades to the existing plant at Te Awamutu, which will continue to discharge via rock channel to the Mangapiko Stream.
- **Mātangi and Tauwhare Pā upgrades:** Improvements to the existing Mātangi WWTP, which will remain online until the wastewater is conveyed to the Southern WWTP or Hamilton City Council (HCC) network around 2040. Upgrades to the existing Tauwhare Pā WWTP, which discharges to land.

These projects will be delivered by a single council on behalf of the other Sub-regional Partners (the "Lead Council"). The Lead Council will utilise its existing resources, policies and procedures for project delivery.

## Project Attributes

The key project attributes which are relevant to the procurement strategy are outlined below.

**Table CC - ES 1: Project attributes**

| Project | Size | Complexity | Integration risk | Timing |
|---|---|---|---|---|
| **Southern WWTP** | At stage one, the WWTP will be small to medium size (starting flow of 400 $m^3$/day with capacity up to 1,200 $m^3$/day). By stage three, the WWTP will be medium to large size (flow of >15,000 $m^3$/day). | Stage one will have relatively straight forward treatment processes. However, it will be designed to be compatible with stages two and three which will require more bespoke design work than for a typical plant of this size. | The plant will be on a greenfield site with no integration risk with existing operations. New conveyancing will be necessary to connect the plant with the existing wastewater network. | Delivery of stage one of the project has short time frames driven by growing servicing needs at the airport precinct. There is expected to be sufficient time to plan and deliver the project. However interim servicing solutions will be required to meet the needs of the airport precinct while stage one is being delivered.<br>Timing of future staging will be based on demand. |
| **Cambridge WWTP** | The WWTP is expected to be of medium / large size (2031 flow 6,800 $m^3$/day up to 2061 11,700$m^3$/day). | It is likely some bespoke process equipment will be required. | The WWTP will be located on a brownfield site adjacent to the existing Cambridge WWTP. There will be significant integration risks with the existing WWTP. No significant additional conveyancing is required over and above what would be needed to service the Cambridge area. | The project has short time frames driven by the consenting conditions. |
| **Te Awamutu Upgrades** | The WWTP is expected to be of medium / large size (2031 flow 5,600 $m^3$/day up to 2061 7,200 $m^3$/day).<br>Future demands will be serviced through upgrades to the existing WWTP | The upgrades will encompass some design work that smaller contractors may not have the necessary resource or skills to undertake. | The works are brownfield in nature, resulting in integration risk with the existing WWTP. | The WWTP has recently been upgraded. A further upgrade will be required to meet demand by 2030. There is expected to be sufficient time to plan and deliver the upgrades. |
| **Mātangi and Tauwhare Pā Upgrades** | The upgrades are expected to be small in size. | More likely to be a straightforward package plant or a duplication of existing technology. | The works are brownfield in nature, resulting in integration risk with the existing WWTP. | Matangi requires immediate upgrades to address existing performance issues and support renewal of the existing consent. There is expected to be enough time to plan and deliver these immediate and longer-term upgrades. |

## Long Lists

**The long list of packaging options assessed for the Projects is provided below: Long list of package options**

Note, the Cambridge WWTP and the upgrade works do not have any conveyancing requirements.

The long list of contracting options is provided below:

**Table CC - ES 2: Contracting options long list**

| Contracting model | Description |
|---|---|
| **Construction only (traditional)** | Private contractor is contracted to develop the facility. All design work is completed prior to the tender and a detailed specification is provided to bidders. Financing is managed by the procuring entity. |
| **Design and build (D&B)** | Private contractor is responsible for design and construction. Procuring entity will prepare the functional and technical performance requirements that are used in the tender process to guide developer design. Financing is managed by the procuring entity. |
| **Managing contractor** | Single managing contractor engages with the procuring entity and undertakes the procurement process on its behalf. The managing contractor enters into a contractual arrangement for each of the proposed packages. |
| **Alliance** | Collaborative model that will bring together the procuring entity and other parties, including contractors and designers, to deliver a 'best for project' outcome. Pain / gain share arrangements where costs below and above target are shared between parties. |
| **Design, build, operate and maintain (DBOM)** | Private contractor is responsible for design and construction as well as long-term operation and maintenance services. The procuring entity secures the financing independently and retains operating demand risk. |
| **Design, build, finance, operate and maintain (DBFOM)** | Concession style arrangement where responsibilities for designing, building, financing, operating and maintaining are bundled together and transferred to a private sector consortium. This model is similar to a number of PPPs that have been completed in NZ with a large degree of risk transfer passed to the private sector. |
| **Private provision** | Development of the facility is outcomes based with the private sector engaged to provide all aspects of work including design, construction, operation and maintenance. The private sector also takes responsibility for approvals and management. The procuring entity would use the facility under a service agreement. |

The methodology for selecting the preferred option used an iterative process, where the long lists were objectively filtered to a short list and preferred option based on Multi Criteria Analysis (MCA).

The preferred procurement strategy for each of the Projects is outlined below:

## Southern WWTP

The procurement strategy for the Southern WWTP is focussed on stage one only. The preferred strategy is to tender two separate work packages; a main plant works package (including civil works and process equipment) and a separate conveyancing package. Both packages are proposed to be tendered using a traditional construction only contract.

**Table CC - ES 3: Procurement strategy – Southern WWTP**

| | |
|---|---|
| **Plant works** | **Construction only** |
| **Conveyancing separate** | **Construction only** |

## Packaging

The key drivers for the packaging approach are outlined below:

- **Risk allocation and management (interface risk):** By contracting the main plant works as one package, the private sector (contractor) will have responsibility for managing interfaces between the main civil works and supply of the process equipment. The Lead Council will also benefit from reduced tender and administration costs. The interface risk between the plant and the conveyancing to be retained by the Lead Council is considered modest by comparison.
- **Risk allocation and management (different risk profiles):** The plant works and conveyancing works have different risk profiles that require specialised expertise. It will be beneficial to tender these packages separately and select the preferred contracting model and contractor for each of them.
- **Deliverability (scale and timeframes):** Stage one of the Southern WWTP is considered too small to justify a separate enabling works package (starting flow of 400 m³/day with capacity up to 1000 m³/day).

## Contracting

The key drivers for the contracting approach are outlined below:

- Main plant works:
  - **Risk allocation and management (design risk):** Construction only is a more straightforward procurement option to tender multiple stages over time. Given the importance of future proofing the WWTP for stages two and three, control over the full design is likely to be more critical. Accordingly, the Lead Council may be better placed to undertake design activities.
  - **Market interest and capability (scale):** Stage one of the Southern WWTP is also not large enough to justify using the DBOM, DBFOM or Private provision contracting models that transfer a high degree of risk to the private sector given the high tender and transaction costs.

- Conveyancing separate:
  - **Risk allocation and management (design risk):** Conveyance pipelines carry toxic substances, travel through public and private land, have a 50–80-year life and represent a huge task to pull up or replace if changes need to be made. It is best to have the rigour of in-house engineers designing conveyance assets, rather than under a tender process where contractors may look to minimise cost. In this instance, transfer of design risk may not be appropriate.

Given the short time frames for stage one of the Southern WWTP driven by growing servicing needs at the airport precinct, it is recommended to proceed with the procurement of professional services to assist with delivery of the pre-implementation tasks. These include:

- Site selection.
- Land acquisition (the site acquired for the WWTP will include the land for discharge).
- Designations and consenting.
- Engagement.

## Cambridge WWTP

The preferred strategy for the Cambridge WWTP is to tender two separate work packages; an enabling works package and a main plant works package (including civil works and process equipment). Both packages are proposed to be tendered using a traditional Construction only contract.

**Table CC - ES 4: Procurement strategy – Cambridge WWTP**

### Te Awamutu Upgrades


### Matangi and Tauwhare Pā Upgrades


## Packaging

The key drivers for the packaging approach are outlined below:

- **Timing and budget confidence (consenting time restraints):** Packaging the enabling works separately scores highly because it provides scope to begin the groundworks in advance of the main plant works contract. The enabling works would otherwise have the potential to delay the main works. This is more important for the Cambridge WWTP than the Southern WWTP given the larger size, its brownfield nature and the consenting time constraints.
- **Risk allocation and management (interface risk):** As per the Southern WWTP, the scoring reflects the level of interface risk between the main plant works and process equipment packages. This becomes more important as the plant gets larger and the process equipment is more bespoke. This creates more interface points, more feedback loops, larger technical process units and therefore higher risk costs associated with supporting the civil works, justifying retaining these works together in one package.

Customer / social outcomes (local content): The separate enabling works contract provides greater opportunity for local contractor participation.

## Contracting

The key drivers for the contracting approach are outlined below:

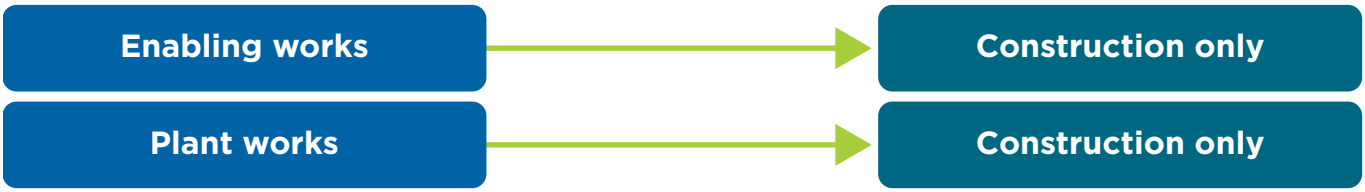
- Enabling works:
  - **Risk allocation and management (complexity):** This will be a simple contract with limited design work required. A traditional Construction only contract is best suited to this package.
  - **Market interest and capability (scale):** The enabling works are not large enough to justify using the DBOM, DBFOM or Private provision contracting models that transfer a high degree of risk to the private sector.

- Main plant works:
  - **Timing and budget confidence (consenting time restraints):** Tender timeframes for Construction only are the most streamlined of the options considered. For the Cambridge WWTP, this is likely be the fastest procurement option.
  - **Market interest and capability (design risk):** There is likely to be more market interest in a Construction only contract than a D&B or DBOM for a medium size plant that has this degree of bespoke design work. Additionally, the higher contractor bid costs for D&B and DBOM may discourage bidders. The medium size of the plant (starting flow 5,000 m3/day up to 9,000 m3/day) does not justify the higher tender and transaction costs of the DBFOM or private provision models.

## WWTP Upgrades

The preferred strategy for the Te Awamutu upgrades is to tender a single work package using a Construction only contract. The preferred option for the Mātangi and Tauwhare Pā upgrades is to tender a single work package using a D&B contract.

**Table CC - ES 5: Procurement strategy – WWTP upgrades**




## Packaging

The key drivers for the packaging approach are outlined below:

- **Deliverability (brownfield):** A single package is preferred because the brownfield nature of the upgrades do not require enabling works.
- **Risk allocation and management (interface risk):** The small / medium scale of upgrades does not justify segregating civils and treatment systems. The Lead Council would retain responsibility for managing the interface risk with no single point of responsibility. The higher administrative, management and tender costs for two procurement processes are not justified.

## Contracting

The key drivers for the contracting approach are outlined below:

- Te Awamutu upgrades:
  - **Risk allocation and management (design risk):** Construction only is considered most appropriate for brownfield upgrades of this nature because there will be multiple complex interfaces with the existing plant. The Te Awamutu scope involves adding a new reactor and aeration system to the plant that smaller contractors may not be capable of accepting design risk on. Meanwhile, it may not of sufficient value for the larger contractors.
  - **Market interest and capability (contractor capability and appetite):** Construction only scores better due to the strong capability of contractors in New Zealand to undertake works of this nature under a Construction only contract. The higher contractor bid costs for D&B may also discourage bidders.
- Mātangi and Tauwhare Pā upgrades:
  - **Risk allocation and management (design risk):** The Tauwhare Pā upgrades are likely to be a straightforward package-type plant or would duplicate existing technology. The design risk is likely to be well understood and it would be efficient for a D&B contractor to assume.

## *The Procurement Plan*

Procurement for all the Projects will be undertaken through a competitive tender process. This will ensure market tension and drive value for money outcomes.

The procurement plan for each Project intends to use a two-stage procurement process with the first stage Expression of Interest (EOI) being publicly advertised through GETS, followed by a Request for Tender (RFT) being made available to the successful respondents.

## *Payment Mechanisms*

All payment mechanisms under the proposed procurements are expected to use a milestone payment methodology whereby contractor remuneration will be linked to agreed project milestones. Payment will be based on the suppliers' successful completion of milestones as detailed in the contract.

## *Type of Contract*

The Construction only contracts are proposed to be contracted using the New Zealand Standard form NZS 3910:2013.

The D&B contract is proposed to be contracted using the New Zealand standard form NZS 3916:2013.

These are both widely understood by councils in New Zealand and are well proven for projects such as these. Given the nature of wastewater assets and the importance of process commissioning at completion, these standard form contracts often undergo revisions to allow for these specific requirements. Alternative international contracts (e.g., New Engineering Contracts (NEC) or International Federation of Consulting Engineers (FIDIC)) can sometimes be better placed for wastewater construction however are less widely used and understood in New Zealand.

## *Accountancy Treatment*

The intended accountancy treatment is for the Lead Council to own the wastewater assets as an asset on their balance sheet. There is not anticipated to be any off-balance sheet treatment under the Construction only or D&B contracting structures. It is envisaged that the assets underpinning delivery of the services will be held on the balance sheet of the Lead Council.

# Financial Case
## He Keehi taahua – puutea, puuranga moni

### *Introduction and Scope*

This report sets out the Financial Case for the Waikato Southern Metro Wastewater Treatment Detailed Business Case ("DBC").

The purpose of the Financial Case is to set out the programme costs, allocation of costs, funding requirements, preferred funding and financing solutions, and affordability impacts.

The scope of the Financial Case encompasses the preferred technical option and does not include financial analysis on the other technical options discussed in the Economic Case.

At the time of writing, the impact of the New Zealand Government's Three Waters Reform process on the Sub-regional Councils is unknown. As such, the DBC has been prepared on the basis of 'business as usual' and where relevant, the proposed structures and funding and financing tools aim to maintain optionality and flexibility to transition to a new structure if required.

### *Project Definition*

The preferred option comprises a programme (the Programme) of wastewater treatment plant (WWTP) and conveyance works across the wider Waikato-Hamilton Waipā Metro Area (the projects). The projects are outlined below:

- **Southern Sub-regional WWTP (Southern WWTP):** Construction of a new WWTP to service the Waikato Regional Airport (the Airport) industrial precinct, Mātangi/Tamahere Hub and southern Hamilton. The WWTP is expected to be located between Rukuhia and the Airport and will be delivered in three stages to align to the estimated demand. Initially, the WWTP will discharge to land, but will ultimately discharge into the Waikato River once stage two triggers are reached.
- **Cambridge WWTP:** Construction of a new WWTP at Cambridge with discharge to the Waikato River to replace the existing plant. The plant will be located on the same site as the existing plant.
- **Te Awamutu upgrades:** Upgrades to the existing plant at Te Awamutu, which will continue to discharge via rock channel to the Mangapiko Stream.
- **Mātangi and Tauwhare Pā upgrades:** Improvements to the existing Mātangi WWTP, which will remain online until the wastewater is conveyed to the Southern WWTP or Hamilton City Council (HCC) network around 2040. Upgrades to the existing Tauwhare Pā WWTP, which discharges to land.

## *Cost Analysis*

Cost estimates have been developed for the Programme and are set out in the following tables. The capital costs for each of the projects including conveyancing costs are set out below. These costs are presented in real terms (today's prices) and the figures will be subject to significant cost inflation over the Programme's planned time horizon.

**Table FC - ES 1: Capital (delivery) costs**

| **Programme Capital Costs ($000's, real)** | | | | | | |
|---|---|---|---|---|---|---|
| **Project** | **2022-31** | **2032-41** | **2042-51** | **2052-61** | **2062-71** | **Total** |
| Southern WWTP | 29,900 | 40,260 | 16,500 | 150,150 | - | 236,810 |
| Cambridge WWTP | 115,720 | 4,290 | 6,050 | 10,780 | - | 136,840 |
| Te Awamutu Upgrades | 20,900 | - | 11,000 | - | - | 31,900 |
| Mātangi WWTP Interim Upgrade | 550 | - | - | - | - | 550 |
| Tauwhare Pā WWTP upgrade | 2,200 | - | - | - | - | 2,200 |
| **Total Capital Expenditure** | **169,270** | **44,550** | **33,550** | **160,930** | **-** | **408,300** |

The ongoing costs (operating expenditure and periodic renewal costs) are set out below. These cost forecasts have been estimated on an annual basis at the start of each 10-year period until 2071. For the purpose of the analysis included in the DBC, linear interpolation was used to estimate the ongoing costs between forecasts.

**Table FC - ES 2: Ongoing costs**

| **Programme Ongoing Costs (annual, $000's, real)** | | | | | |
|---|---|---|---|---|---|
| **Programme cost** | **2031** | **2041** | **2051** | **2061** | **2071** |
| Southern WWTP operating costs | 544 | 672 | 2,050 | 2,050 | 7,400 |
| Cambridge WWTP operating costs | 2,040 | 2,340 | 2,660 | 2,790 | 2,790 |
| Te Awamutu WWTP operating costs | 2,600 | 2,800 | 3,200 | 3,300 | 3,300 |
| Tauwhare Pa WWTP operating costs | 40 | 40 | 40 | 40 | 40 |
| Hamilton South conveyancing operating costs | - | - | - | 800 | 800 |
| Mātangi conveyancing operating costs | - | 102 | 102 | 102 | 102 |
| **Total operating costs** | **5,224** | **5,954** | **8,052** | **9,082** | **14,432** |

## *Risks and Complexities*

There are a number of risks associated with delivering a relatively complex and long-term programme of works, which may impact these cost estimates. The key risks in relation to the Financial Case are summarised below.

- **Long-term programme:** The accuracy of cost estimates is likely to reduce the further out they are being forecasted given the increasing levels of uncertainty. Additionally, the timing of certain elements of capital expenditure could change based on population growth (i.e., those that rely on staged thresholds) which further reduces the level of certainty. Costs will also increase due to an uncertain amount of inflation which is likely to be significant over the length of the Programme.
- **Level of design work to support costings:** Detailed design work has not yet been undertaken for each of the projects which constrains the accuracy of the cost estimates. Costs will be refined as the design work is further progressed through subsequent phases of the Programme.
- **Three Waters Reform programme:** The Three Waters Reform programme may significantly change the way wastewater projects and services are delivered across the region, which could affect the funding and other assumptions used in the DBC.

A contingency allowance of 30% was included in the capital cost estimates to recognise the degree of uncertainty at this stage of the Programme (refer to Economic Case Section [5.12 – Cost Estimates]). A contingency allowance of 10% was also included for operating costs. Costs and contingencies for each project will continue to be refined as the Programme is progressed.

## *Cost Allocation*

Given the potential for the projects to service communities that are located within different Territorial Authority (Councils) districts, the project costs may need to be allocated amongst HCC, Waipā District Council (Waipā DC) and Waikato District Council (Waikato DC) (collectively referred herein as the Sub-regional Councils).

This allocation is undertaken on a beneficiary pays basis whereby costs are split between the relevant councils depending on the proportion of communities that are served and the time period over which they are served. The objective of this approach is to ensure that the beneficiaries of the projects are the ones that ultimately pay for them.

Commensurate with this approach, cost allocation methodologies were developed for each of the different Programme components (e.g. capital costs for local reticulation, capital costs for conveyancing, etc.), which identified the specific beneficiaries of each component. An overview of the cost allocation methodologies is provided below.

Table FC - ES 3: Cost allocation methodology

| Component | Methodology |
|---|---|
| **Local reticulation – capital costs** | Costs for upgrades or new local reticulation (where applicable) are proposed to be met by the relevant council (or developer) on the basis that only beneficiaries within the territory would benefit from the works.<br>The relevant council is expected to recover these funds as additional properties are connected. |
| **Conveyance - capital costs** | Costs for upgrades or new conveyancing are proposed to be met by the council relying on the conveyancing for connection. This is because the beneficiaries of the conveyancing would be located within that district (e.g. the capital cost of new pipes to connect Mātangi would be expected to be funded by Waikato District Council). |
| **Conveyance - operating costs** | As per conveyance capital costs, conveyance operating costs are proposed to be met by the Council that is using the conveyancing. |
| **WWTP - capital costs (upgrades and new plants)** | WWTP capital costs are proposed to be allocated between the councils based on one of the following two formulations:<br>• For a project with only one stage, the level of Population Equivalent demand from users in the district serviced by the project over its useful life, compared to the level of Population Equivalent demand from users over its useful life; or<br>• For a project with multiple stages the proportion of capital costs for each stage will be allocated based on the level of Population Equivalent demand from users in its district by that stage of the project over the useful life of that stage's assets, compared to the level of Population Equivalent demand from users over the useful life of that stage's assets.<br>• For a project with multiple stages there will be a need to account for the reuse of assets from prior stages of the project. In this case, immediately prior to each future stage being commissioned an assessment of the reusable value from prior stages will be undertaken. The reusable asset valuation will be used in the following ways:<br>i. added to the capital costs of the new stage and allocated using the same methodology set out above;<br>ii. used as the basis for compensation of the council(s) that has funded the prior stage of the project. This compensation could be delivered using a rebate to the council or by netting off the council's share of the reusable asset value from their funding obligations for the new stage of the project. |
| **WWTP - operating costs** | WWTP operating costs are proposed to be allocated based on the proportion of Population Equivalent demand serviced by the WWTP, as a proxy for the distribution of beneficiaries.<br>The calculation of the respective proportions will need to be updated regularly to reflect changes in the level of Population Equivalent demand in each district. The expectation is that the proportions will be estimated every three years (i.e. to align with Long Term Plan (LTP) cycles), and then confirmed at the start of each financial year as part of the Annual Planning process. |
| **Land and consenting costs (Southern WWTP)** | Given the land and consenting costs will benefit all stages of the project, land acquisition, planning, and consenting costs for the Southern WWTP are proposed to be shared pro-rata according to the estimated final state of wastewater flows in 2061. The base case timing assumes that Hamilton South will have been connected to the Southern WWTP by this point. No sale proceeds are assumed for surplus land if discharge to land is discontinued as the land will be retained as part of the future plant. |

Based on the cost allocation approach set out above, a breakdown of each council's share of the costs for the projects is set out below.

**Table FC - ES 4: Council cost allocation**

| Project | Council | 2022-31 | 2032-41 | 2042-51 | 2052-61 | 2062-71 | Total |
|---|---|---|---|---|---|---|---|
| Southern WWTP | HCC | 15,300 | - | - | 119,627 | - | 134,927 |
| | Waipā DC | 14,481 | 29,204 | 18,296 | (5,069) | - | 56,911 |
| | Waikato DC | 119 | 3,796 | (1,796) | (158) | - | 1,962 |
| | **Total** | **29,900** | **33,000** | **16,500** | **114,400** | **-** | **193,800** |
| Mātangi conveyancing costs | Waikato DC | - | 7,260 | - | - | - | 7,260 |
| Hamilton South conveyancing costs | HCC | - | - | - | 35,750 | - | 35,750 |
| Southern WWTP (incl. conveyance) | Total | 29,900 | 40,260 | 16,500 | 150,150 | - | 236,810 |
| Cambridge WWTP | Waipā DC | 115,720 | 4,290 | 6,050 | 10,780 | - | 136,840 |
| Te Awamutu Upgrades | Waipā DC | 20,900 | - | 11,000 | - | - | 31,900 |
| Mātangi and Tauwhare Pā Upgrades | Waikato DC | 2,750 | - | - | - | - | 2,750 |
| **Total** | | **169,270** | **44,550** | **33,550** | **160,930** | **-** | **408,300** |

| Operating costs | Council | 2031 | 2041 | 2051 | 2061 | 2071 |
|---|---|---|---|---|---|---|
| Southern WWTP* | HCC | - | - | - | 1,670 | 6,027 |
| | Waipā DC | 544 | 624 | 1,998 | 365 | 1,318 |
| | Waikato DC | - | 48 | 52 | 15 | 55 |
| | **Total** | **544** | **672** | **2,050** | **2,050** | **7,400** |
| Cambridge WWTP | Waipā DC | 2,040 | 2,340 | 2,660 | 2,790 | 2,790 |
| Te Awamutu | Waipā DC | 2,600 | 2,800 | 3,200 | 3,300 | 3,300 |
| Tauwhare Pa | Waikato DC | 40 | 40 | 40 | 40 | 40 |
| Southern Hamilton Conveyance | HCC | - | - | - | 800 | 800 |
| Matangi Conveyance | Waikato DC | - | 102 | 102 | 102 | 102 |
| **Total** | | **5,224** | **5,954** | **8,052** | **9,082** | **14,432** |

* A negative figure represents a rebate to the council due to the reuse of assets that it has already paid for under the previous stages. Please see the table below for further detail on Cost Allocation Methodology.

The cost allocation for the Southern WWTP in 2022-31 reflects:

- The allocation of land and consenting costs which are allocated between the councils based on the estimated final state of wastewater flows in 2061; and
- The stage 1 build costs which are predominantly allocated to Waipā DC based on the population served.

Additionally, there is potential for Waikato Regional Airport Limited (WRAL or the Airport) to provide funding for the project which could influence the cost allocation and Waipā DC's funding requirements for stage one. The Airport has immediate servicing requirements for its existing and proposed developments in the area and discussions with the Airport have signalled the potential to work together to provide a wastewater solution that meets their needs.

Despite not connecting to the Southern WWTP until 2061, HCC is contributing $16 million in the ten-year period ending 2031 for land and consenting costs. Purchasing the site early has a number of benefits to HCC:

- Acquiring the land now preserves flexibility and optionality for a long term wastewater solution e.g. if Pukete capacity runs out sooner than anticipated or if the pace of development south of Hamilton is

faster than anticipated. The need for flexibility is further highlighted by the Housing Supply Bill that the Government announced recently which has the potential to both bring forward development, and increase the density of development, in the Hamilton Metro area.

- Purchasing the site early ensures the planned Southern WWTP can be carried out without the need to modify consents or design work later should the site no longer be available.
- A significant amount of development is expected to occur in the sub-region resulting in strong demand for developable land parcels. Securing the site now will likely reduce the cost of the overall programme by avoiding paying for substantial growth in land values if the site were to be purchased in future.

Costs for the other projects in the above tables are allocated to the council where the project is located, which demonstrates there is limited cross boundary servicing for these assets.

## *Lead Council Delivery Model*

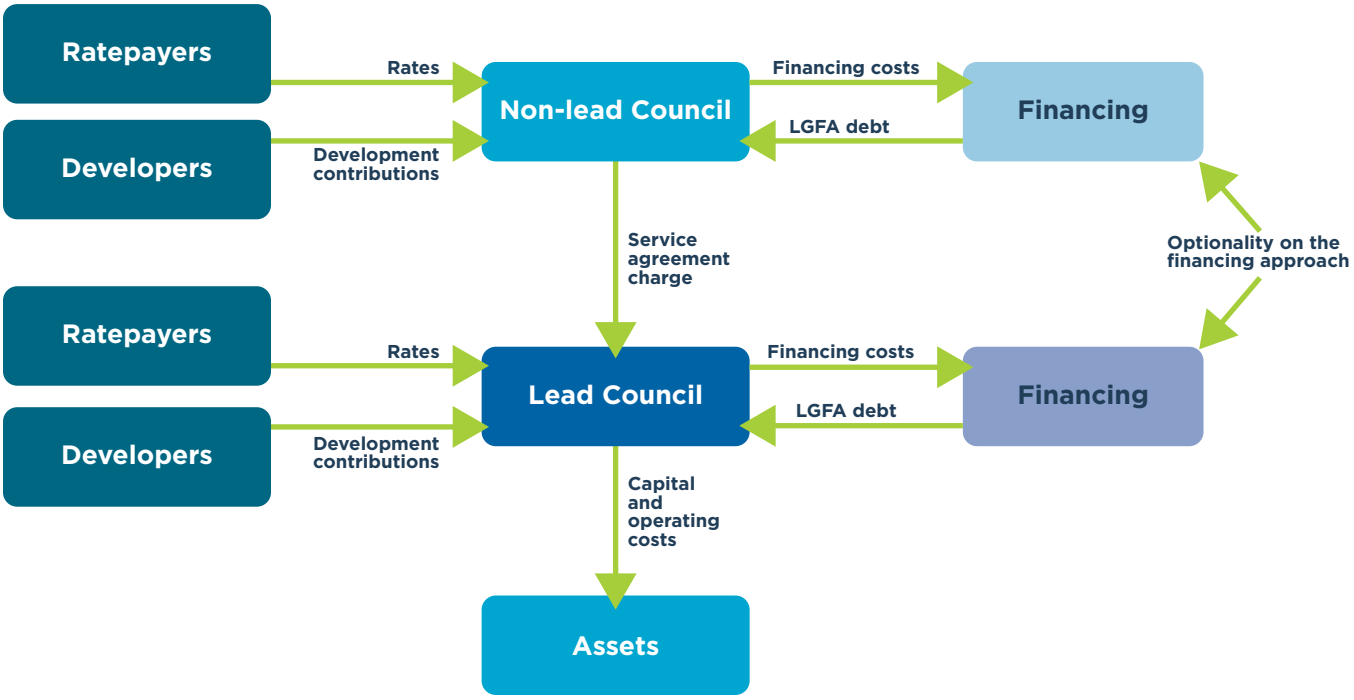
The projects are proposed to be delivered by a single council as the sole beneficiary of the project or in the case of the Southern WWTP on behalf of the other Sub-regional Councils (the Lead Council). The Lead Council will utilise its existing resources, policies and procedures to deliver the project (See Management Case Section [1.2.2 Project Management Arrangements]).

Under the Lead Council model there is optionality regarding how each Programme is financed:

- Financing for each council's share of the capital costs is raised by each respective council and passed through to the Lead Council. This is the approach generally applied in the Financial Case.
- Financing of the full project cost is proposed to be undertaken by the Lead Council and where costs have been allocated to other councils (the Non-Lead Council), costs (including financing costs) are proposed to be recouped through a service agreement. Of the different projects, this arrangement is most relevant to the Southern WWTP. A sensitivity assessment illustrating the impacts of this approach is included in Financial Case Section [9.4l]. The Non-Lead Council is expected to meet the service payment through applying its preferred funding tools to the communities that benefit from the project within its respective territorial boundaries.

An overview of the proposed structure is provided in Figure FC - ES 1.

**Figure FC - ES 1: Lead Council funding and financing structure**



The proposed Lead Councils for each project are outlined below:

**Table FC - ES 5: Project Lead Councils**

| Project | Lead Council |
|---|---|
| Southern WWTP | Hamilton City Council |
| Southern Hamilton Conveyance | Hamilton City Council |
| Cambridge WWTP | Waipā District Council |
| Te Awamutu upgrades | Waipā District Council |
| Mātangi and Tauwhare Pā upgrades | Waikato District Council |
| Matangi / Tamahere Conveyance | Waikato District Council |

## *Funding and Financing Approach*

Financing is likely to be required to smooth and spread the delivery phase costs across the life of the projects while funding tools will be used to recover these costs from the beneficiaries. An evaluation of the funding and financing options available to the councils was undertaken using a long list, short list and preferred option multi criteria analysis framework. The options were evaluated based on a set of assessment criteria which reflected the underlying objectives and KPIs of the Programme.

The following steps were taken to determine the preferred funding and financing approach:

- Development of a long list of funding and financing options.
- Development of assessment criteria to evaluate the funding and financing options.
- Assessment of long list of options against the criteria to determine a short list of funding and financing options.
- Consultation and discussion with stakeholders on the short list to agree the preferred funding and financing approach.

Based on this assessment and options evaluation, the preferred funding and financing approach is for each council to leverage its existing funding tools (e.g. general rates, targeted rates, development contributions, etc.), as per their current revenue and financing policies. These are outlined below.

**Table FC - ES 6: Current council funding and financing approaches**

| Council | Current funding approach | Current financing approach |
|---|---|---|
| HCC | General Rates and Development Contributions | Generally debt funded through the LGFA |
| Waipā DC | Targeted Rates and Development Contributions | Generally debt funded through the LGFA |
| Waikato DC | Targeted Rates and Development Contributions | Generally debt funded through the LGFA |

Responsibility for collecting rates and development contributions will remain with the respective councils within their own territories, regardless of whether they are the Lead Council. They will be responsible for determining which funding tools are utilised for each project.

## *Affordability*

A high-level assessment of the affordability of the Programme was undertaken based on an assessment of:

- The burden on ratepayers to fund the additional general and/or targeted rates;
- The cost to developers of development contributions; and
- The debt headroom under the current relevant LGFA covenants for each of the council.

This high-level assessment indicates that the Programme is affordable for each of the Sub-regional Councils and their ratepayers. However, this should continue to be tested as certainty over the timing and magnitude of costs improves. This is further discussed below.

### Ratepayer Affordability

An overview of the estimated annual impact (i.e. the incremental increase in rates per ratepayer) of the Programme on ratepayers is provided in the following table.

**Table FC - ES 7: Estimated rating impact**

| Year | 2031 | 2041 | 2051 | 2061 | 2071 |
|---|---|---|---|---|---|
| HCC – General Rate | $112 | $88 | $75 | $386 | $612 |
| Waipā DC – Southern WWTP Targeted Rate | $403 | $874 | $468 | $282 | $304 |
| Waikato DC – Southern WWTP Targeted Rate | - | $2,153 | $1,631 | $1,257 | $1,266 |
| Waipā DC – Cambridge WWTP Targeted Rate | $520 | $394 | $368 | $352 | $331 |
| Waipā DC – Te Awamutu WWTP Targeted Rate | $260 | $300 | $315 | $287 | $276 |
| Waikato DC – Mātangi & Tauwhare Pa Targeted Rate | $110 | $466 | $435 | $404 | $371 |

An overview of the affordability of these rates increases is provided in the table below. The assessment is based upon the 5% affordability threshold that was identified in the 2007 COVEC report into rates affordability. Ratepayer affordability has been assessed based on adding the average rating impact for a ratepayer to the average household rates bill as provided by the councils. At the date of this document, Waikato District Council did not participate in this rating survey.

**Table FC - ES 8: High-level rates affordability assessment**

| Council | Median Household income (2021) | Affordability threshold (5%) | Average rates per household | Average additional project rating impact | Total rating burden | Affordability check |
|---|---|---|---|---|---|---|
| HCC – Southern WWTP | $77,485 | $3,874 | $2,770 | $499* | $3,269 | ✓ |
| Waipā DC – Southern WWTP | | | $3,092 | $466 | $3,558 | ✓ |
| Waikato DC – Southern WWTP | | | $2,649 | $1,577 | $4,226 | - |
| Waipā DC – Cambridge WWTP | | | $3,092 | $393 | $3,485 | ✓ |
| Waipā DC – Te Awamutu WWTP | | | $3,092 | $288 | $3,380 | ✓ |
| Waikato DC – Mātangi & Tauwhare Pa upgrade | | | $2,649 | $357 | $3,006 | ✓ |

* Average additional project rating impact calculation only considers years 2061 and 2071 for HCC i.e. after Hamilton South switches to using the Southern WWTP. The additional rating impact would not be applied to Hamilton North.

Source: Stats NZ.

Table FC - ES 8 demonstrates that the rating impacts generally fall within the affordability thresholds set out by COVEC based on the average additional project rating impact for each council's ratepayers. The exception to this is the Waikato DC – Southern WWTP rating impact which is above this threshold by 9%. This is primarily driven by the costs of conveyancing from Mātangi to the Southern WWTP, with the relative rating impact reducing as further growth comes online in the future. It should be noted that there are likely other costs that would need to be considered in more detail prior to implementing an increase in rates, such as additional water related costs, mortgage servicing costs and other cost of living increases.

Under current council policies, HCC uses a general rate whereas Waikato DC and Waipā DC use a targeted rate. To provide a complete picture of the ratepayer affordability, Pukete upgrade costs would also need to be included in HCC's rating impact assessment. This will be considered as part of the Northern Metro Wastewater DBC.

## Affordability of Development Contributions

The size of the development contributions required for each project was estimated using the following approach:

- An assessment was undertaken on the portion of costs that the Lead Council would need to recover from its ratepayer base.
- An estimate was made of the portion of the project that is attributable to growth. The increase in Population Equivalent units of demand over the forecast operational life of the project was used as a proxy for growth.
- Then a calculation was made to determine the pro-rata allocation of these costs to the amount that is attributable to growth. It is assumed this amount can be recovered from development contributions.
- A financing charge was then applied based on the respective interest rates for each council and solved for a level of development contribution that recovers the cost allocated to growth over the life of the project.

This analysis assumes that no financial contributions are received from the Airport.

The estimated development contribution per Household Unit Equivalent (HUE) of demand for each of the councils is provided in the table below. Population data has been divided by 2.5 to convert it into HUE's.

**Table FC - ES 9: Estimated development contributions (per HUE of demand)**

| Council | 2031 | 2041 | 2051 | 2061 |
|---|---|---|---|---|
| Hamilton CC – Southern WWTP | - | - | - | - |
| Waipā DC – Southern WWTP | $9,728 | $9,728 | $9,728 | $9,728 |
| Waikato DC – Southern WWTP (Matangi and Tamahere Commercial) | - | - | - | - |
| Waipā DC – Cambridge WWTP | $7,327 | $7,327 | $7,327 | $7,327 |
| Waipā DC – Te Awamutu WWTP | $2,162 | $2,162 | $2,162 | $2,162 |
| Waikato DC – Mātangi & Tauwhare Pa | $6,261 | $6,261 | $6,261 | $6,261 |

The development contributions reflect the portion of project costs that are allocated to growth beneficiaries for each council. No development contributions are shown for HCC or Waikato DC for the Southern WWTP as the plant will only be servicing existing HCC and Waikato DC communities during the time period to 2061. The development contributions set out above compare reasonably to existing levels charged by the councils, falling near the middle of existing wastewater related charges for the councils.

## Affordability for Councils

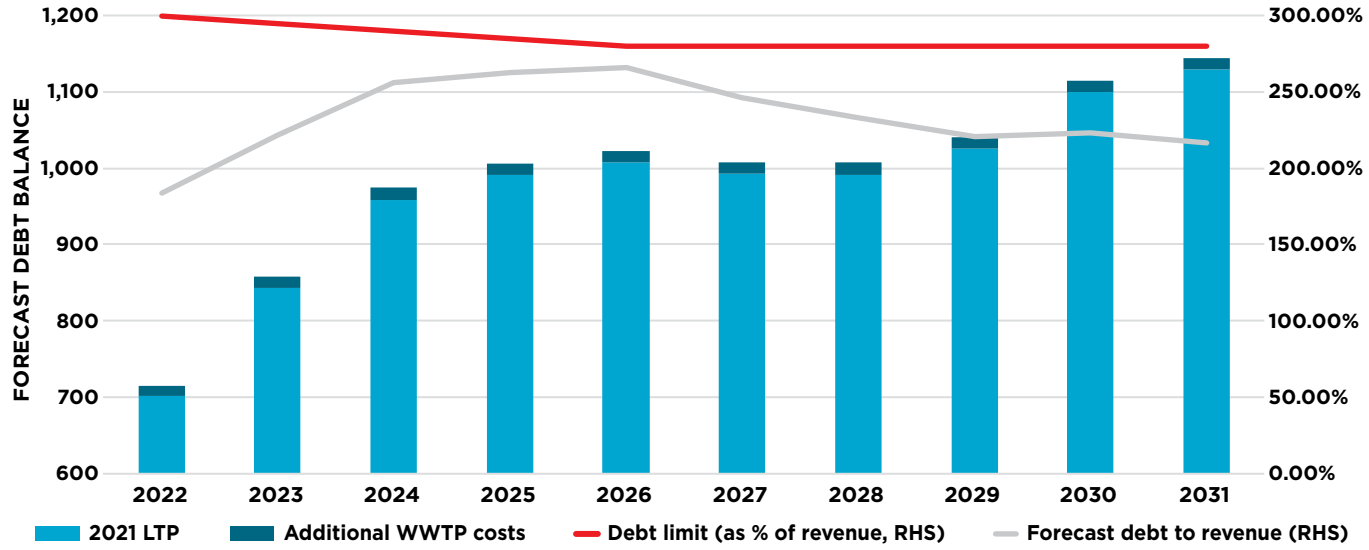
The affordability analysis for councils was based on whether (or not) the financial impacts of the Programme resulted in any of the councils breaching their LGFA debt to revenue financial covenants. For the purposes of this analysis, the following key assumptions were used:

- **Lead Council:** The delivery costs of the Programme were assumed to have been debt funded and treated as being 'on-balance' sheet for the purposes of the LGFA covenant calculation, and from a credit rating and accounting perspective.
- **Non-Lead Council:** The obligation to make service payments to the Lead Council were treated as being financial liabilities, and therefore 'on-balance sheet' for the purposes of the LGFA covenant calculation, and from a credit rating and accounting perspective.

The accounting and credit rating treatment for these service agreements will depend on the specific commercial arrangements that are agreed. It is recommended that formal advice should be sought once the service agreement has been agreed to confirm its treatment.

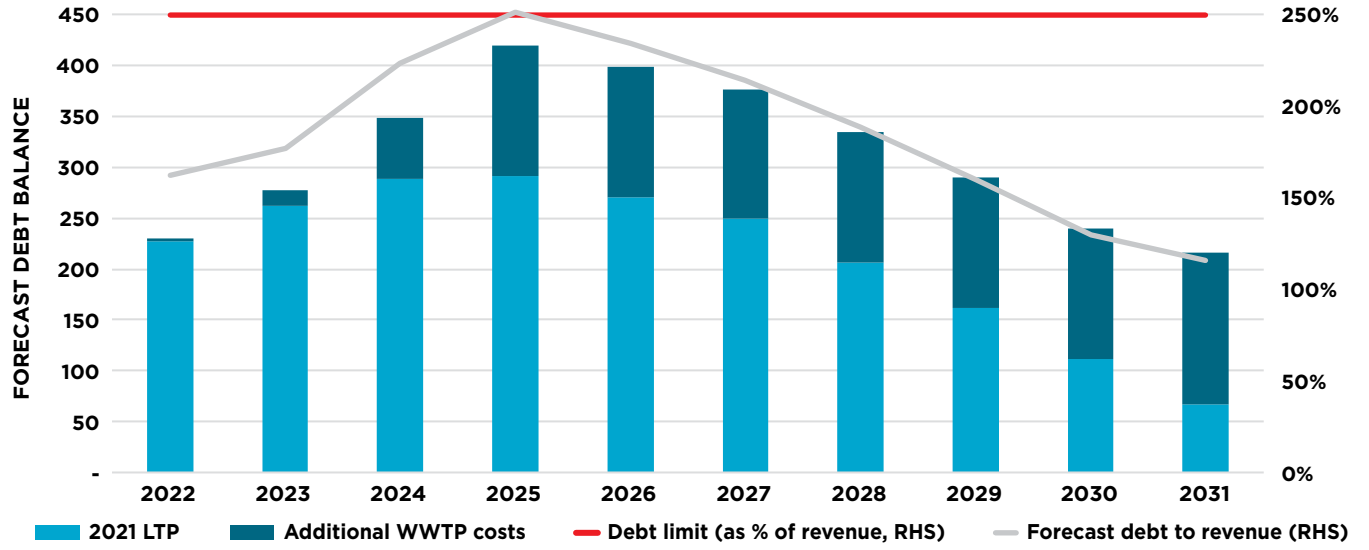
The estimated financial impact on the debt to revenue ratio for each of the councils over the next 10 year LTP period is provided in the figures below. Debt forecasts were not available beyond this period.

**Figure FC - ES 2: Forecast HCC debt to revenue ratio**



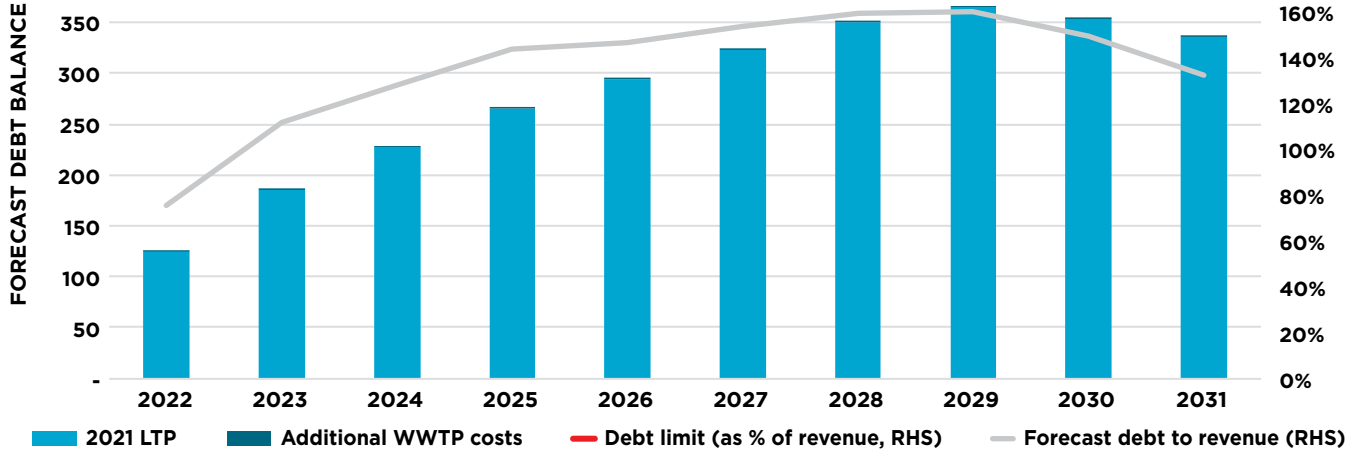

Source: Hamilton City Council Long Term Plan 2021-31

**Figure FC - ES 3: Forecast Waipā DC debt to revenue ratio**




Source: Waipā District Council Long Term Plan 2021-31

**Figure FC - ES 4: Forecast Waikato DC debt to revenue ratio**




Source: Waikato District Council Long Term Plan 2021-31

* Note: Revenue received from development contributions has been excluded from the revenue figures as they are not included in the LGFA's metrics due to their one-off and uncertain nature.

As demonstrated in the charts, the councils are forecast to remain within the debt to revenue caps after allowing for the impact of the Programme over the next 10 years, although HCC do get close to breaching their debt limit.

## Sensitivity Analysis

A Net Present Value (NPV) for the overall programme has been determined to understand the current value of all the future cash flows of the Programme. This measure can be used to test the sensitivity of the Programme to changes in the underlying assumptions (e.g. inflation or changes to costs).

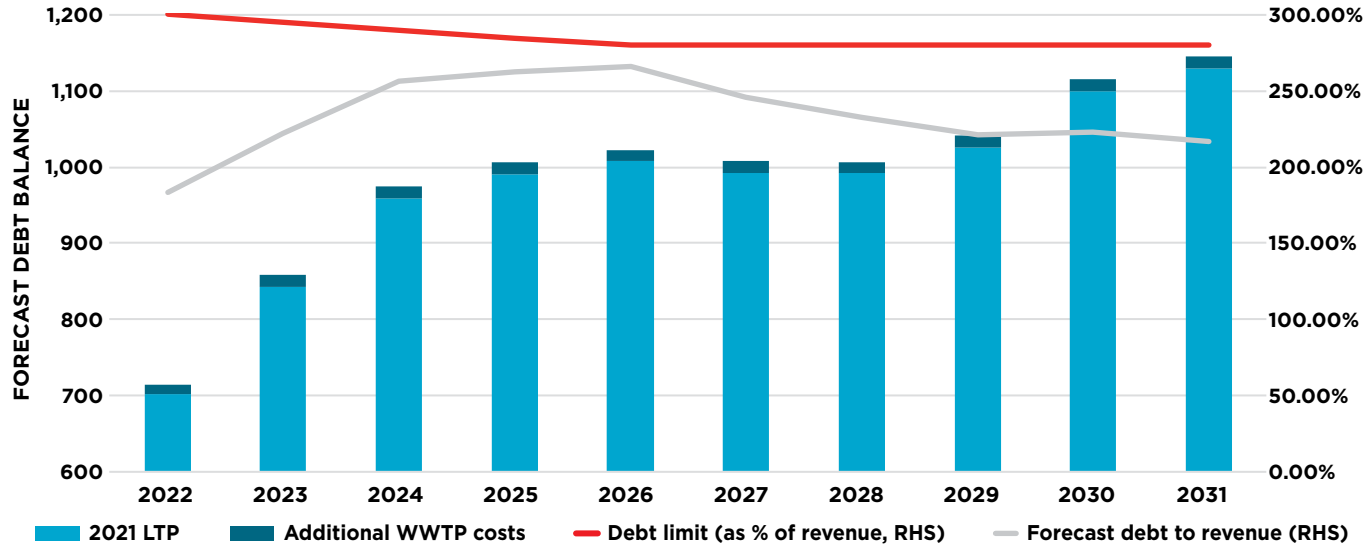
The estimated NPV for the Programme is -$344.1 million, which is based upon the capital and ongoing costs outlined in Financial Case Section 3 and a five-percent real discount rate (as per the New Zealand Treasury guidance).

A similar analysis has been undertaken to test the impact on the council debt to revenue ratios. Again these measures were evaluated after applying changes to capital costs. The analysis identified that HCC and Waikato DC are not significantly impacted in the next 10 years due to the comparatively small capital expenditure and although Waipā DC's debt does increase, this is relatively minor in scale compared to their current debt portfolio.

## Alternative Financing Model

We have also considered the impact of the alternative approach whereby the Lead Council finances the project in its entirety and charges the participating councils a service delivery charge. Under this approach HCC will need to borrow significantly more to finance the delivery of the early stages of the Southern WWTP and recover these costs through a service agreement charge. The allocation of costs will not change between either financing approach.

**Figure FC - ES 5: Forecast HCC debt to revenue ratio**




Source: Hamilton City Council Long Term Plan 2021-31

Under the alternative financing approach, HCC would need to borrow $15 million more than under the base case in the period up to 2031. HCC would finance the land purchase, consenting, initial plant groundworks and Stage 1 capital costs on its balance sheet, and then recover these costs from the Non-Lead Councils through a service charge. This financing approach brings HCC closer to its debt limit but still does not result in a breach.

Debt limits have not been modelled out beyond HCC's current 10-year LTP period. However, the impact of this financing approach on HCC's debt limits would be more acute in the 2032-2051 period as Stage 2 capital costs ramp up. In that period HCC would be borrowing a significant amount to fund assets that are predominantly servicing Waipā and Waikato communities.

# Management Case
## He Keehi Whakahaere - Whakatinanatanga

### *Introduction and Scope*

This document sets out the Management Case for the Waikato Southern Metro Wastewater Treatment Detailed Business Case (DBC).

The purpose of the Management Case is to confirm the proposal is achievable and detail the arrangements needed to ensure successful delivery as well as manage project risks.

The preferred option comprises a programme (the Programme) of wastewater treatment plant (WWTP) and conveyance works across the wider Waikato-Hamilton Waipā Metro Area (the Projects). The Projects include:

- **Southern Sub-regional Plant (Southern WWTP):** Construction of a new WWTP to service the Waikato Regional Airport (the Airport) industrial precinct, Mātangi/Tamahere Hub and southern Hamilton. Initially, the WWTP will discharge to land, but will discharge to the water and ultimately into the Waikato River once capacity triggers are reached.
- **Cambridge WWTP:** Construction of a new WWTP at Cambridge to replace the existing plant with discharge to the Waikato River.
- **Te Awamutu upgrades:** Upgrades to the existing plant at Te Awamutu WWTP, which will continue to discharge via rock channel to the Mangapiko Stream.
- **Mātangi and Tauwhare Pā upgrades:** Improvements to the existing Mātangi WWTP, which will remain online until the wastewater is conveyed to the Southern WWTP or Hamilton City Council (HCC) network around 2040. Upgrades to the existing Tauwhare Pā WWTP, which discharges to land.

The scope of the Management Case includes the management, governance and risk management arrangements for the wider Programme as well as those applicable to each individual Project.

At the time of writing, the impact of the New Zealand Government's Three Waters Reform process on the sub-regional councils is unknown. As such, the DBC has been prepared on the basis of 'business as usual' and where relevant, the proposed structures aim to maintain optionality and flexibility to transition to a new structure if required.

## *Memorandum of Understanding*

Given the Projects will be undertaken at different times, locations and by different parties, strong collaboration between the respective councils, iwi and mana whenua will be required to successfully deliver the strategic outcomes agreed in the DBC. A Memorandum of Understanding (MoU) is intended to be entered into shortly after the finalisation of the DBC to capture these requirements.

The key terms of the MoU will include:

- Minimum treatment plant performance standards
- Governance and programme delivery structure
- Cost allocation, funding and financing
- Southern WWTP staged development thresholds
- Identification of Lead Councils
- Cross-boundary servicing arrangements
- Project ownership

## *Lead Councils*

The projects within the wider Programme of works will be delivered by a single council on behalf of the other Sub-regional Partners (the Lead Council). The Lead Council will utilise its existing resources, policies and procedures to deliver the project.

The Lead Councils for each project are outlined below:

**Table MC - ES 1: Lead Councils**

| Project | Lead Council |
|---|---|
| Southern WWTP | Hamilton City Council |
| Cambridge WWTP | Waipā District Council |
| Te Awamutu upgrades | Waipā District Council |
| Mātangi and Tauwhare Pā upgrades | Waikato District Council |

## *Governance Structure*

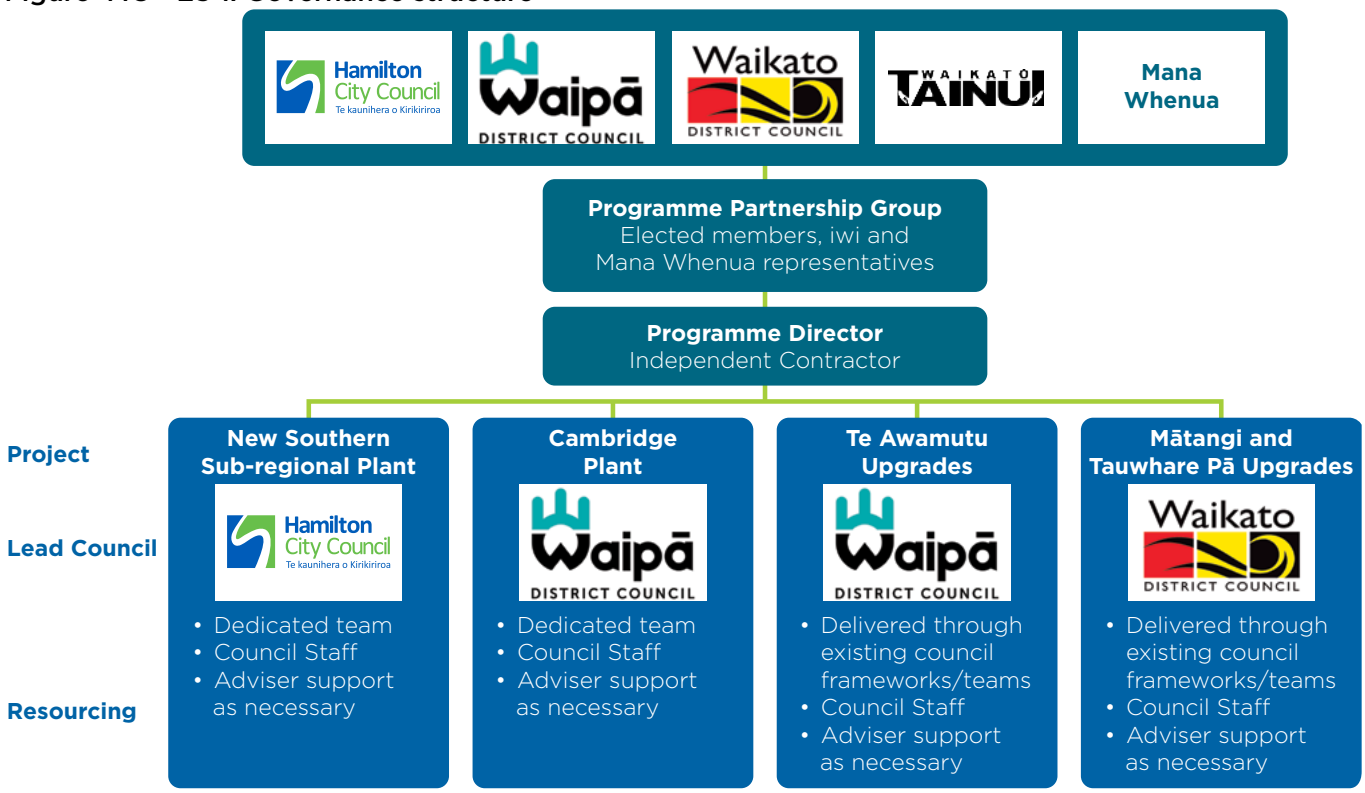
The governance structure comprises:

- Project level: Existing governance arrangements applicable to each Lead Council.
- Programme level: The Programme Partnership Group (PPG) and the Programme Director.

The project level governance arrangements reflect the Lead Council structure and are consistent with existing project delivery policies and decision-making frameworks. The Programme level governance is structured on a joint basis with representation from Waikato-Tainui, mana whenua, Waipā District Council (Waipā DC), Waikato District Council (Waikato DC) and HCC (collectively referred herein as the Sub-regional Partners). The purpose of the joint governance structure is to provide oversight to ensure the strategic objectives in the DBC/MoU are being followed by each Lead Council and opportunities for collaboration and integration are being captured.

The proposed governance structure is outlined below:

**Figure MC - ES 1: Governance structure**




The PPG is a senior level joint governance group that will be established contractually between the Sub-regional Partners and will provide direct oversight of the areas relevant to the wider Programme. The PPG members will still be required to seek endorsement for decisions at their home organisations (i.e., the PPG cannot make decisions that utilise the powers of Local Government). All PPG decisions are expected to be made by consensus, however, if voting is needed, all member organisations will have one vote each.

The Programme Director will be independent of the Sub-regional Partners, sit across the whole Programme and report to the PPG. The Programme Director will be the key intermediary between the individual Projects and the PPG.

The Lead Council will retain oversight of core project delivery functions and provide oversight through existing governance arrangements. The scope of the Lead Council will include consenting and planning, procurement, construction management and asset management.

## *Project Organisation Structure*

Resourcing for each project will be managed by the Lead Council. The two new WWTPs (Southern WWTP and Cambridge WWTP) will require a mix of dedicated resourcing, existing council teams and advisory support.

The two upgrades (Te Awamutu WWTP, Matangi/Tauwhare Pa WWTPs) are expected to be managed through existing council resources given their smaller scale (supported by advisers as necessary).

The proposed organisational structure for the two new WWTPs is based on Project activities to be undertaken at each stage. The organisational structure will evolve over time to ensure it remains fit-for-purpose. They have been broken down into three key stages:

- Initial phase (pre-implementation)
- Construction phase (implementation)
- Operations phase (post-implementation)

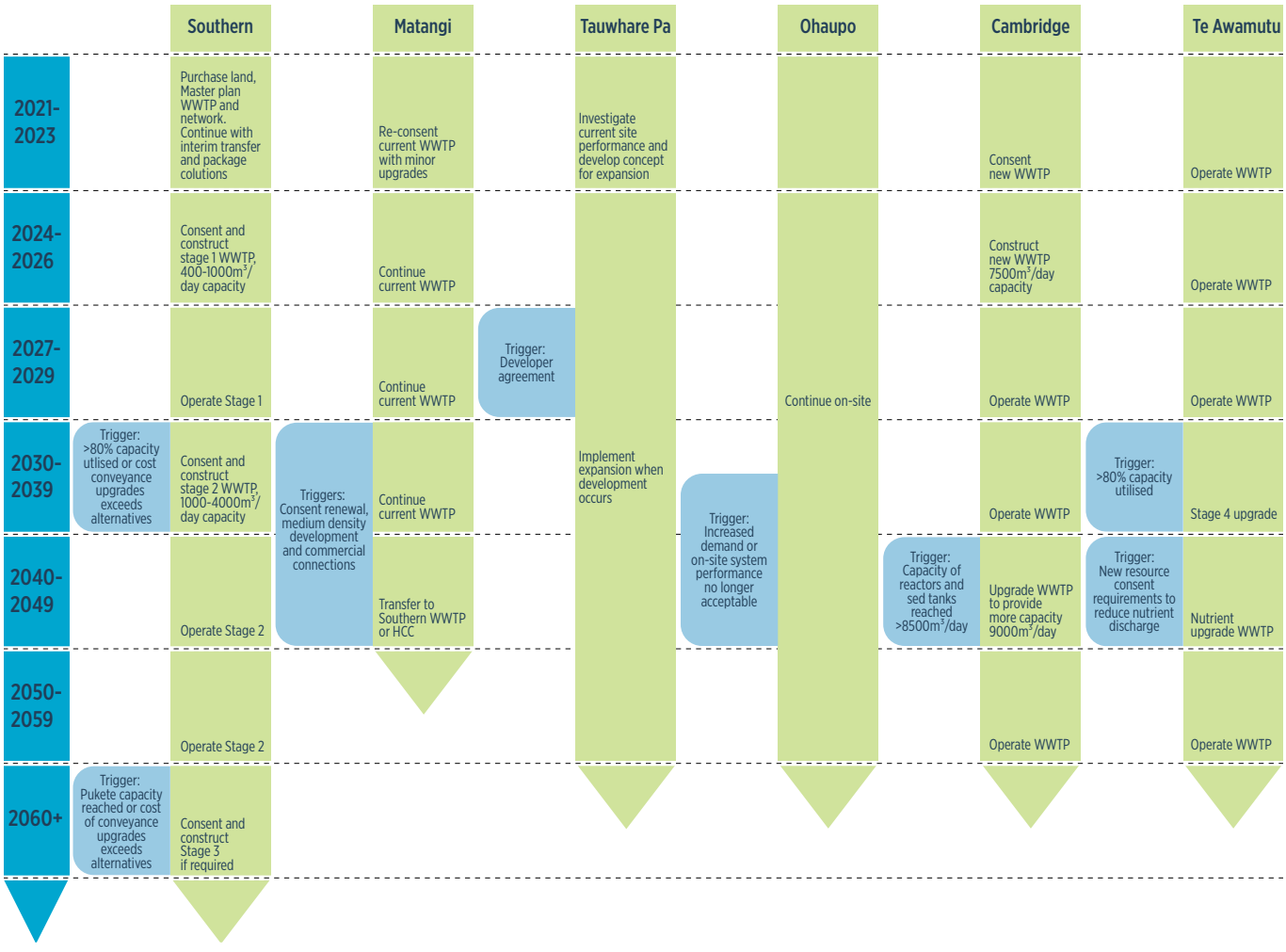
## *Use of Special Advisors*

Where additional support is required to supplement existing council resources and expertise, specialist advisors and/or external contractors will be used. Each project will require varying levels of specialist support, likely to cover planning, engineering, commercial, financial and legal expertise.

## *Project Plan and Milestones*

A summary of the key milestones for the Projects included within the preferred option is presented below:

**Figure MC - ES 2: Key Milestones – Programme**



## *Change Management Planning*

The delivery of the new WWTPs and upgrades that make up the Programme of works are not expected to significantly change the culture or systems of the Lead Councils. The key cultural shift will be the need for the Lead Council to provide project reporting to the Programme Director and PPG. Specific reporting recommendations have been put in place to manage this change (refer below).

Operationally, the technology of stage one of the Southern WWTP is expected to be comparable to other HCC assets although the scale will be smaller. The Cambridge WWTP will be more complex than existing wastewater assets managed by Waipā DC. Training of staff will be undertaken as part of the commissioning and handover process. The design team is expected to be involved in this process alongside the contractor and process equipment supplier. The scale and technology of the Te Awamutu, Mātangi and Tauwhare Pā upgrades is comparable to existing assets managed by Waipā DC and Waikato DC.

## *Benefits Management Planning*

The strategy, framework and plan for dealing with the management and delivery of benefits are detailed in the Benefits Realisation Plan (BRP) attached to this business case as Appendix M. The BRP outlines the proposed approach for managing benefits and provides a framework for ongoing assessment against the project objectives and Key Performance Indicators (KPIs).

## *Monitoring and Reporting*

Monitoring and reporting will include:

- Pre-implementation Monitoring: During planning and consenting phases monthly cost and progress reporting will be prepared for each of the Projects by the relevant Project Manager
- Construction Monitoring: During construction, monthly cost and progress reporting will be prepared for each of the Projects by the relevant Project Manager.
- PPG Reporting: High level reporting will be prepared for the PPG meetings every quarter. This will summarise the key updates from each of the projects based on planning, consenting, construction and / or BRP reporting.
- Project Closure Report and Post Implementation Review: On completion of each project, a project closure report will be drafted by the Project Manager. A post implementation review will be undertaken by the respective Lead Council to assess the success of the project, including the business case, planning and delivery phases.
- Operational Reporting: The Local Government Act 2002 requires that all councils provide annual reporting on the performance of their wastewater systems. This reporting will be provided by the Lead Council for each project. This reporting will be in addition to any specific reporting required to comply with resource consent and/or designation conditions.
- BRP Reporting: Benefits management will be managed by the Lead Council at a project level and reported directly to the Programme Director and PPG. Benefit realisation reviews will be undertaken annually during the life of the assets.

## *Risk Register*

Project level risks will be managed by the Lead Council using their existing risk management framework. Programme level risks will be compiled by Programme Director using monthly risk reporting received from each of the Lead Councils.

The key risks from the risk register are provided below:

## Table MC - ES 2: Top risks

| Risk Description | Cause | Controls | Likelihood | Consequence | Residual Risk Rating | Risk Treatment | Action Plan |
|---|---|---|---|---|---|---|---|
| **The recommended DBC projects cannot be funded leading to the projects being delayed, not proceeding or lower standards being adopted.** | - **Competing priorities leading to unwillingness to fund the Projects.**<br>- **Insufficient financial headroom for councils to fund the Projects.**<br>- **Cost increases or affordability the ability to secure funding or financing.**<br>- **Lack of integration, coordination and planning at a sub-regional level.** | - Staging for the Southern WWTP.<br>- Traditional approach to financing.<br>- Lead Council structure agreed in principle and to be confirmed through MOU.<br>- Funding to commence implementation of projects recommended in the DBC included in LTPs. | Likely (3) | **Catastrophic (5)** | Very High Risk (15) | Mitigate | - MoU signed by project partners which confirms principles agreed in the DBC including approach to ownership, funding and financing.<br>- Establish governance and delivery structure recommended in the DBC for the programme.<br>- Ensure appropriate joint engagement between councils/partners occurring throughout project.<br>- For Southern Plant, HCC to enter into service agreement with Waipa DC to contribute toward funding the plant. |
| **Costs to implement recommended DBC projects are significantly higher than estimates further impacting on affordability and leading to the project being delayed, not proceeding or lower standards being adopted.** | - **Increasing land costs, high contractor demand, limited providers, increasing costs of key materials, supply chain disruption or poor risk allocation in the construction contracts.** | - Monitor market conditions.<br>- Procure works and services as early as possible to reduce impact and likelihood of escalation.<br>- Undertake a procurement methodology that attracts multiple tenderers.<br>- Sensitivity assessments completed as part of the DBC to assess the effect of changing inflation rates and operating and capital costs.<br>- Recommended immediate initiation of key projects in the DBC. | Likely (3) | **Catastrophic (5)** | Very High Risk (15) | Accept | - Complete site selection, land acquisition, consenting and designation processes early as recommended in the DBC.<br>- Early contractor engagement and identification of preferred procurement method.<br>- Procure works and services as early as possible to reduce impact and likelihood of escalation.<br>- Undertake a procurement methodology that attracts multiple tenderers. |
| **The recommended DBC projects do not meet partner expectations which may impact ability to implement the recommendations, consentability and adversely impact relationships.** | - **Lack of meaningful engagement with relevant groups throughout project delivery.**<br>- **Mana whenua/ iwi views not reflected in Governance discussions and decision making.**<br>- **Differing priorities/points of view on level of treatment and discharge methods.**<br>- **Insufficient budget available to deliver "best for river" outcomes in timeframes that are acceptable to partners.** | - Project has been co-designed and developed by the partners and this approach will be built on through the project pre-implementation and implementation phases.<br>- Metro WW Project vision and objectives embed Te Ture Whaimana and incorporate iwi/mana whenua values and aspirations (e.g. Iwi Env Plans, Economic Aspirations.<br>- Recommended governance and project delivery structure provides partner representation at senior level. | Likely (3) | **Major (4)** | Very High Risk (12) | Mitigate | - MoU signed by project partners which confirms principles agreed in the DBC including minimum wastewater treatment standards and project governance structure<br>- Establish governance and delivery structure recommended in the DBC for the programme.<br>- Review & implement communications and engagement plan for each project including specific provision for iwi/mana whenua engagement and partner councils (at multiple levels). Project engagement and delivery approaches to incorporate co-design to solutions and seek mutual agreement. |

| Risk Description | Cause | Controls | Likelihood | Consequence | Residual Risk Rating | Risk Treatment | Action Plan |
|---|---|---|---|---|---|---|---|
| **Resource consents and designations for recommended wastewater projects cannot be secured or the costs to deliver a consentable solution are prohibitive.** | - **New activity and discharge to the Waikato River (considered in isolation) is not consistent with the Te Ture Whaimana, NPS FM, and other policy (incl. current NES for Sources of Human Drinking Water and land application requirements).**<br>- **Other WWTPs consent renewal timeframes do not align.**<br>- **Legislative change Vision and Strategy and legislative change.** | - Collaborative approach to delivering the project that involves equal Iwi / TLA representation. Project Governance Group.<br>- Having regulator involved in the project to offer advice.<br>- Utilise the technical teams involved in Cambridge WW Consenting, PC1 Healthy Rivers Processes and Pukekohe WW consenting and leveraging off of that work.<br>- Consenting Strategy - consistent with the current Vision & Strategy for the river. Identification of alternative consenting pathways to link to other discharges. | Likely (3) | **Catastrophic (5)** | Very High Risk (15) | Mitigate | - Secure the site for new Southern WWTP.<br>- Thoroughly explore beneficial re-use opportunities to avoid or reduce the need for water based wastewater discharges.<br>- Look for mechanisms to link discharge activities across the broader catchment in order to clearly demonstrate betterment despite a new WW discharge.<br>- Ensure appropriate treatment standards are adopted including WRP, TTWM, Iwi Mgmt. Plans etc.<br>- Develop and implement appropriate engagement strategies and plans, including project governance, and technical advisory groups. Ensure consistent messaging across related projects and workshops. |
| **Reform of the Three Waters sector impacts the ability or committment to implement the DBC programme recommendations.** | - **Potential views that all work should be deferred until clear decisions on sector reform resulting in slowing down of critical infrastructure investment.**<br>- **If reform occurs, the 'actors' involved in project delivery may change and impact on project prioritisation and delivery.**<br>- **Principles and obligations agreed in the MoU are not carried over to a new water entity that is set up as a result of the planned sector reform.** | - The preferred options were prepared on the basis of 'business as usual'<br>- The recommended programme and project delivery structures aim to maintain optionality and flexibility to transition to a new structure if required.<br>- Agreements clearly documented in the MoU and DBC so knowledge transfer can occur to the new water entity. | Likely (3) | **Major (4)** | Very High Risk (12) | Mitigate | - Continue to implement recommendations in the DBC and MoU in line with proposed implementation schedule.<br>- Accelerate implementation of the recommended projects. |
| **Inability for councils to move to integrated delivery of programme results in uncoordinated delivery of the overall programme results in misalignment of objectives and 'Best for River' principles.** | - **Misalignment of objectives and commitment of resources from Sub-regional Partners.** | - MoU to include agreement on minimum performance standards and project governance and delivery structures.<br>- Benefit Management reporting and monitoring processes recommended in the DBC.<br>- Compliance with consent requirements. | Likely (3) | **Major (4)** | Very High Risk (12) | Mitigate | - Include agreement upfront in the MoU.<br>- Ongoing joint visibility through the governance structure and reporting processes recommended in the MoU. |

The mitigations for these top risks demonstrate that the Programme is reliant on the partners continuing to work together constructively, implementing the recommendations in the DBC and entering into the MoU in good faith. Failure to do so would likely result in materialisation of a number of these risks.

The risk register is included as Appendix P to this document. The full document includes the full list of risks and further information in relation to categorisation, responsible parties, target dates and post action plan target risk ratings. 1.12 Next Steps

## *Next Steps*

This DBC seeks formal approval from the Sub-regional Partners to progress the implementation of the preferred option.

The immediate next steps are outlined below:

1. Finalise and enter into the MoU.
2. Establish the proposed governance structure, including the PPG and the Programme Director.
3. Progress with the proposed Project Plans as per Section [1.2.7 Project Plan and Milestones]. The initial activities are outlined below:

    a. Southern WWTP:

        i. Continue discussions with the Waikato Regional Airport regarding interim arrangements.
        ii. Finalise the preferred site (October 2021).
        iii. Acquire the land for the WWTP (April 2022).
        iv. Begin concept design / master plan / consent application preparation (May 2022).

    b. Cambridge WWTP:

        i. Finalise preliminary work including the Procurement Plan and Risk Register (September 2021).
        ii. Continue progressing the activities that are already underway:

            1. Consenting.
            2. Technical investigations.
            3. Concept engineering.