

Southwest Wastewater Treatment Plant – Assessment of Alternative Sites

Prepared for Watercare Services Ltd
Prepared by Beca Limited

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Revision History

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Executive Summary

This assessment of alternatives report has been prepared on behalf of Watercare Services Limited (Watercare) as the requiring authority for a new Southwest Wastewater Treatment Plant (WWTP). This report supports the Notice of Requirement (NoR) for designation and has been prepared in accordance with Section 171(1)(b) of the Resource Management Act 1991 (RMA).

In 2018, a discharge consent for a 35-year period was granted for a new treated wastewater discharge into the Waiuku River off the Clarks Beach golf course. As part of that discharge consent it was assumed that the existing Waiuku WWTP would be upgraded to service the anticipated population growth in the Southwest growth area. However, more recently, Watercare identified considerable potential whole of life carbon savings if they changed the location of the WWTP to be closer to Clarks Beach and the discharge location. Watercare commissioned Beca Limited (Beca) to undertake an alternative options assessment process for a new WWTP location.

The assessment of alternatives methodology was developed to assess alternative WWTP locations and ultimately determine a preferred option. The key steps adopted in the assessment of alternative sites were as follows:

1. **Develop project objectives and initial screening criteria:** Objectives were developed for the project and then specific criteria were applied in the site selection process, including site size, distance from the Boyd Road conveyance site (a central point closer to Clarks Beach and the discharge location) and zoning under the Auckland Unitary Plan, Operative in Part (AUP:OP).
2. **Undertake an additional screen of land parcels:** The Project Team (comprising consultants and Watercare) developed a long list of land parcels following the initial screening criteria. Initially 26 long-list sites were identified, however a further nine sites were identified as the result of feedback from mana whenua and the community.
3. **Long list assessment of sites:** The long list sites were subject to a traffic light assessment against the project assessment criteria and were ranked either green, amber, or red depending on how well that site met the criteria. At the long list assessment workshop, the Multi-Criteria Analysis (MCA) framework and any scoring was collectively reviewed. Upon completion of the workshop, the Project Team met to review and test the results to determine which sites would progress to the short list. Seven sites made it through to the short-list.
4. **Short list assessment of sites:** The short list sites were rated on a scale from 0 (the worst) to 9 (the best) by technical experts and the Project Team. These scores were then presented and challenged in an interdisciplinary MCA workshop, where some scores were consequently changed. As a result of this process, two sites were considered as the 'emerging preferred sites'.
5. **Confirmed preferred site:** The preferred site was identified once the Project Team assessed the advantages and disadvantages of the two emerging preferred sites and Watercare confirmed the final preferred site.

Watercare undertook engagement with mana whenua, key stakeholders and the community in parallel to steps 3-5 above and factored this into its options assessment.

Based on the long list assessment options (step 3), sites **B, C, S, T, W, X** and **Z** proceeded to the short list stage as they were mostly larger sites and were (with the exception of site Z) relatively close to the Boyd Road conveyance site (as shown in Figure E1). The Project team carried out onsite assessments for sites B, C, S, T and Z (sites X and W were unable to be accessed).



Figure E1: Short-Listed Sites

Following the short list assessment (step 4), sites **B** and **Z** were selected as the emerging preferred sites. Site **B** was selected as it is a larger site, achieves a good odour buffer, provides some flexibility on the WWTP location within the site and is in closest proximity to the outfall at Clark's Beach. Overall, site **B** aligned most closely with the MCA criteria and was the highest ranked site. Site **Z** was identified as a low risk option due to the fact it is an existing designated WWTP site, and provides greater certainty around timing and operation, although scored lower against some criteria, and scored lower overall than site **B**.

Following further consideration of the relative advantages and disadvantages of the two emerging preferred sites, and engagement with mana whenua and the community, Watercare selected site **B** as the preferred site for the future Southwest WWTP.

1 Introduction

1.1 Background and Context

Watercare Services Limited (Watercare) is a lifeline utility providing water and wastewater services to 1.7 million people in Auckland. Watercare supplies reliable, high-quality drinking water to homes and businesses in the Auckland region and collects, treats, and discharges their wastewater in environmentally responsible ways. Its services are vital for life, keep people safe and help communities to flourish.

As a council-controlled organisation (CCO), wholly owned by Auckland Council, Watercare manages water and wastewater assets worth over \$14 billion and plan and build infrastructure to ensure that growth is supported today and into the future.

Watercare's vision is to be *"trusted by our communities to deliver exceptional performance every day"*. Watercare's mission is *"reliable, safe and efficient water and wastewater services"*.

The Southwest growth area (comprising Waiuku, Clarks Beach, Glenbrook Beach and Kingseat) currently has a population of approximately 12,500 people and is serviced by three existing WWTPs at Clarks Beach, Kingseat and Waiuku. The Clarks Beach WWTP services the Clarks Beach and Glenbrook Beach communities while the Kingseat and Waiuku WWTPs service the surrounding local communities (Figure 1).

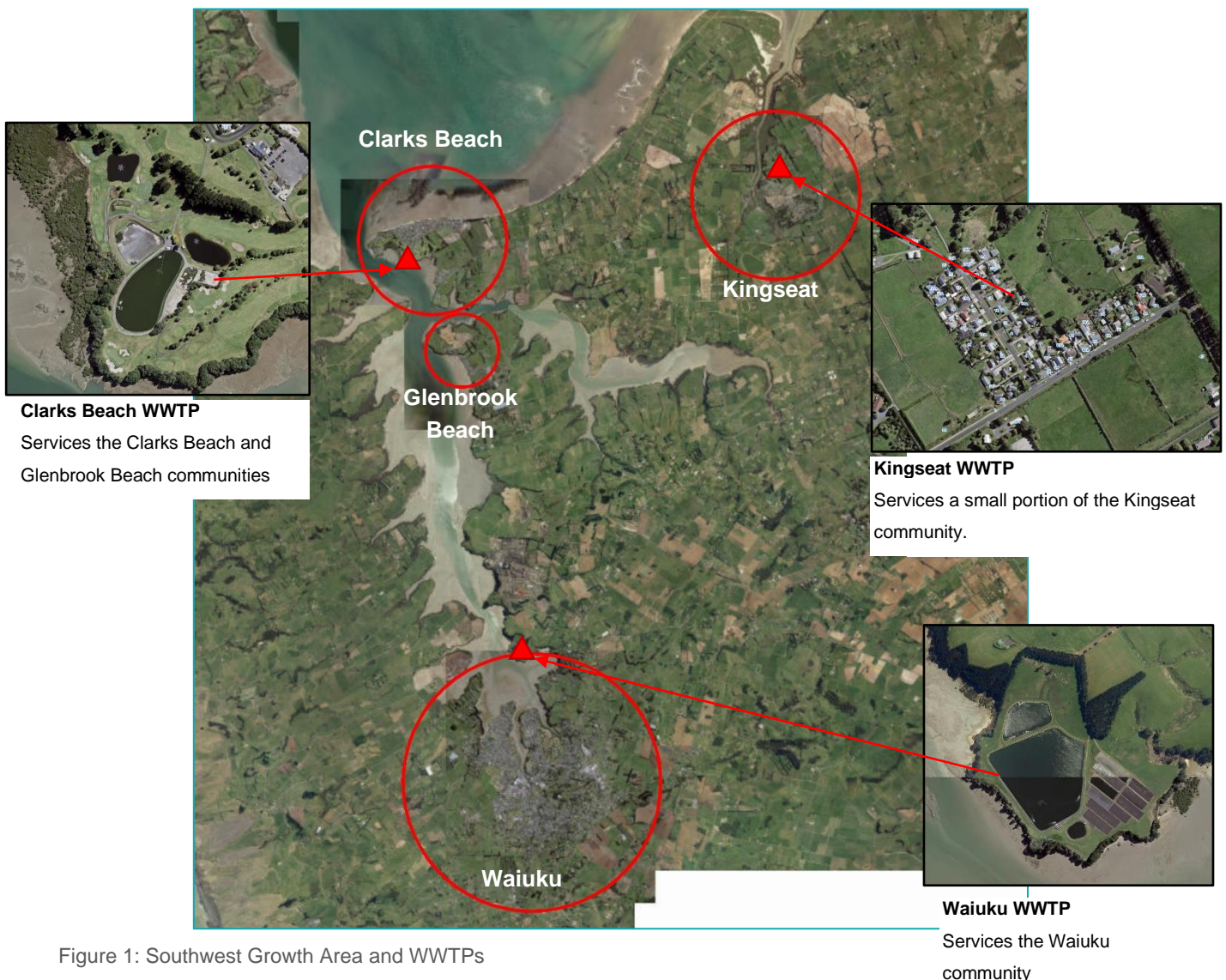


Figure 1: Southwest Growth Area and WWTPs

In 2015, Watercare started investigating options to manage wastewater in the Southwest area in response to the anticipated growth identified in the AUP:OP. Through this work, Watercare identified a sub-regional WWTP as the preferred option to service the anticipated population growth (approximately 30,000 people by 2050) in the Southwest growth area. A wastewater discharge consent was subsequently granted in 2018 for a 35-year period. The discharge consent involves a new discharge location off Clarks Beach Golf Course as this was considered the Best Practicable Option (BPO) following a three-stage Assessment of Alternatives process. As part of this scheme it was proposed that the existing Waiuku WWTP would be upgraded; however, this was not consented as part of the discharge consent.

In addition, the conditions of the discharge consent provide for an ongoing review through a Monitoring and Technology Review Report. This five-yearly review includes a range of matters including:

“options the consent holder has investigated for wastewater reduction and/or reuse, including Managed Aquifer Recharge and industrial reuse, and any actions taken as a result of those investigations”.

These reviews will be ongoing throughout the duration of the discharge consent, which may result in a future need for an Advanced Water Treatment (AWT), that will produce water to a potable or near potable standard, to be constructed at the WWTP site following the traditional wastewater treatment process.

However, in light of Watercare’s climate change strategy (introduced in 2019), optimisation of the 2021-2041 Asset Management Plan, the introduction of the Enterprise Model and the 40:20:20 vision¹, a challenge process was undertaken for the project. This process identified considerable opportunities for carbon savings with the most significant benefits being realised if the WWTP location was changed.

As such, Watercare commissioned Beca to undertake an option assessment process for a new WWTP in the Southwest growth area.

1.2 Project Objectives

Section 171(1)(c) of the Resource Management Act 1991 (RMA) states:

“When considering a requirement and any submissions received, a territorial authority must, subject to Part 2, consider the effects on the environment of allowing the requirement, having particular regard to -

(c) whether the work and designation are reasonably necessary for achieving the objectives of the requiring authority for which the designation is sought...”

The objectives for the project were developed by the Project Team and are as follows:

To provide for the treatment of wastewater in southwest Auckland in a manner that:

- a. Responds to planned growth*
- b. Protects public health*
- c. Provides for flexible implementation including potential wastewater reuse in the future*
- d. Keeps the overall costs of service to customers at sustainable levels*
- e. Helps Watercare achieve its targets for reducing carbon emissions*
- f. Has regard to mana whenua’s cultural and spiritual values.*

¹ Under the 40:20:20 Vision Watercare seeks to achieve a 40% reduction in construction carbon and 20% reduction in cost by 2024, and a 20% year on year improvement in health, safety and well-being.

2 Purpose of this Report

This assessment of alternatives report has been prepared on behalf of Watercare as the requiring authority for the Southwest WWTP. This report will support the Notice of Requirement (NoR) for designation and has been prepared in accordance with Section 171(1)(b) of the Resource Management Act 1991 (RMA).

Section 171(1)(b) of the RMA requires that when making a recommendation on a NoR, a territorial authority shall consider whether adequate consideration has been given to alternative sites, routes or methods of undertaking the work in circumstances where the requiring authority:

- a. Does not have an interest in the land sufficient for undertaking the work; or
- b. Where it is likely that the work will have significant adverse effects on the environment.

This report only address the consideration of alternative sites; alternative routes or methods will be addressed separately.

There are several principles and key considerations for a requiring authority to apply and adhere to when undertaking an assessment of alternatives and identifying a preferred option. Of note are the following:

- The process should be adequately transparent and robust, and clearly recorded so that it can be understood by others;
- An appropriate range of alternatives should be considered;
- The extent of options considered, and the assessment of these options, should be proportional to the potential effects of the options being considered;
- The requiring authority must show that is has not acted arbitrarily or given only cursory consideration to alternatives.
- The focus under section 171 is on the process that was followed. There is no requirement to show that the best alternative has been chosen.

At the time of writing this Report, Watercare does not have sufficient interest in the land required for the Project and as such are required to give adequate consideration to alternatives.

3 Assumptions

General assumptions regarding the assessment of alternatives process were agreed upon before the analysis and subsequently embedded in the assessment of alternatives methodology. The key assumptions are summarised below.

3.1 Existing Treated Wastewater Discharge Consent

The proposed wastewater treatment scheme for the southwest sub-region combines a new WWTP with discharge via a consented outfall located adjacent to the existing Clarks Beach WWTP into the Waiuku River. The Environment Court Consent Order² grants an eight-year lapse period for the discharge (until June 2026). This discharge consent expires 35 years from the date the consents commence and are subject to a range of management and monitoring plan requirements throughout the consent duration.

Further, key conditions of the discharge consent include:

- The requirement for a Community Liaison Group, responsible for:
 - Reviewing the WWTP overall performance.
 - Reviewing results of monitoring and receiving environment monitoring report.
 - Reviewing the Operations and Management Plan.
- Monitoring and Technology Review conditions.
 - Assess options for wastewater reduction and/or reuse.
- The development of Operations and Management Plans.

3.2 Conveyance

A conveyance system including pipelines and pumping station(s) is required to convey the wastewater from Waiuku and Clarks Beach to a new WWTP for treatment. Conveyance of wastewater from Kingseat is to be developer funded and subject to confirmation by the developer.

Proposed pipeline sizes are indicative and are based on targeting a velocity of 0.9 – 2m/s (preferably <1.5m/s). Pipeline alignments are based in line with the nearest road, where available, and are subject to optimisation and further design in the following stages. These stages will include the consideration of potential pipeline alignments in private property and directional drilling options.

3.3 Treatment

The proposed WWTP should provide for potential capacity to service a long-term population equivalent (PE) of 60,000 in the Southwest area and also provide an area of land for an additional AWT plant that results in water suitable for reuse. Whilst the existing discharge consent only provides for a very high treatment quality for a population of 30,000, it is prudent to secure additional land to provide for additional growth in the long-term and potential reuse, being a key consideration in the ongoing reviews required under the conditions of the discharge consent.

² The Manukau Harbour Restoration Society Incorporated v Auckland Council [2018] ENV-2018-AKL-00002

4 Assessment of Alternatives Methodology

4.1 Introduction

This section provides an overview of the assessment of alternatives methodology developed to assess alternative WWTP locations and ultimately determine a preferred option. The key steps are outlined in Figure 2 and described below. Each step is explained in detail in the sections that follow.

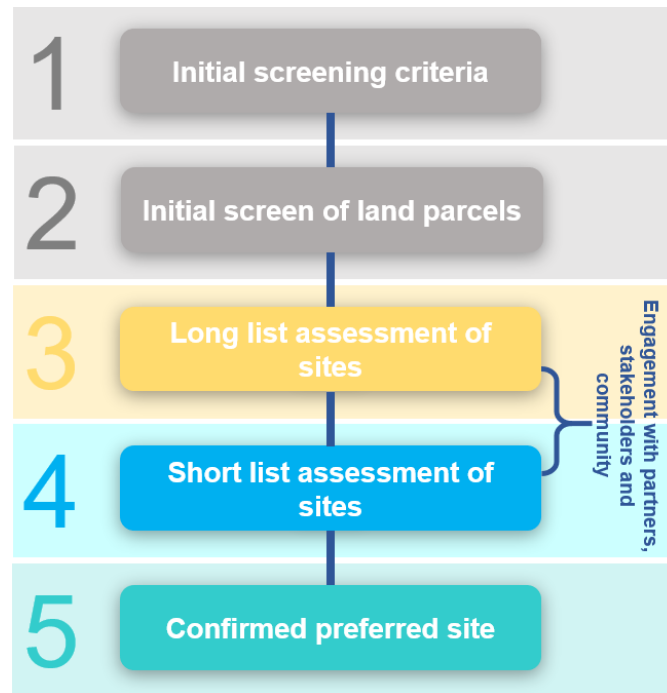


Figure 2: Methodology

The process for the assessment of alternatives was as follows:

4.2 Step 1 – Initial Screening Criteria

To support the long-term wastewater treatment infrastructure needed for future growth, the following minimum land area requirement was determined for the site:

- Area sufficient for the WWTP itself to cater for a long-term future population of 60,000 Person Equivalent (PE) with an additional area allowance for an AWT Plant. This area is approximately 4 ha.
- Inclusion of a minimum 200m buffer around the 4 ha site to provide an area of land to buffer potential adverse odour effects associated with the operation of the WWTP. The minimum land requirement for the WWTP and buffer is therefore approximately 30 ha.

Based on the assumptions outlined above and the minimum land requirement, the following initial screening criteria were applied to the site selection process:

- Boyd Road was considered to be the central point where future flows would likely converge to be directed to the new outfall location adjacent to the Clarks Beach golf course. To identify potential WWTP sites within a suitable distance of Boyd Road, a maximum radius of 4 km was determined from the Boyd Road conveyance site. It was assumed that within that 4km distance, that benefits would be realised of relocating the WWTP.

- Locating a future WWTP within land currently zoned urban or future urban under the AUP:OP was considered inconsistent with the objectives and policies of the current or future zoned urban land, accordingly sites with this zoning were not considered further.
- Given that the minimum site size requirement was approximately 30 ha, it was considered that acquiring many smaller sites to meet this total area requirement was unfeasible, however, it may be feasible to combine a small number of adjacent sites that were smaller than 30 ha. Sites smaller than 10 ha are generally, but not always, located in proximity to sensitive receivers and formed part of existing residential developments. In addition, a considerable number of smaller parcels would be required to make up an amalgamated site. Therefore, land parcels with an area less than 10 ha were not considered further.
- Land to the west of the Waiuku Channel was initially excluded due to the difficulty in constructing marine pipeline crossings to the west and access to operate the facility.

4.3 Step 2 - Initial Screen of Land Parcels

Following the application of the initial screening criteria, a long list of land parcels was developed. These sites A-Z are described in Section 7.17.1 of this Report.

4.4 Step 3 – Long List Assessment of Sites

Step 3.1 - GIS Platform

To assist the consideration of alternative WWTP sites, a project geographic information system (GIS) platform was established. This was an online, interactive tool created specifically to allow technical experts to view all known constraints within the vicinity of the Southwest growth area and to inform the later assessment of sites.

Step 3.2 - MCA Framework

Following the application of the initial screening criteria, the long list sites were subject to a traffic light assessment against the project assessment criteria (see Table 1 below). At the long list stage, technical experts (ecologists, odour specialist, archaeologists, etc.) and the Project Team (including planners) ranked each site green, amber, or red depending on how well that site met the criteria (as set out below).

	Meets criteria well
	Marginally meets the criteria
	Does not meet the criteria

All criteria points contained in Table 1 were considered in the long list assessment; however, criterion 1a were not scored as part of the MCA process. While these were non-scored criterion, in response to feedback from mana whenua, they remained a key consideration for the long list assessment and feedback from mana whenua was assessed and considered in the selection of shortlisted sites.

Table 1: Assessment Criteria for Long List Options

Topic	Number	Criteria	Measure(s) / Potential Adverse Effects on:	Source
Cultural Values	1a	Cultural Values	Potential effects on the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga.	Mana whenua engagement
Heritage	2a	Heritage	Sites and places of known value: Heritage buildings, places Notable trees Sites and places of archaeological value. Sites and places of European cultural heritage value	Auckland Council GIS

Topic	Number	Criteria	Measure(s) / Potential Adverse Effects on:	Source
Social and Community	3a	Land requirement	Area of private land required Area of public land required Number of properties / special status of impacted property). Consider the current use of the site, landholdings, and associated complexity (i.e. acquiring multiple single sites vs larger sites) to make up to the 30-ha requirement	Auckland Council GIS
	3b	Social impact	Impact on community facilities (e.g. schools, shops, cultural facilities) and impact on recreational facilities	Auckland Council GIS
	3c	Odour amenity	Distance to sensitive sites and potential to accommodate a minimum 200m buffer within the site	Site areas
	3d	Operational effects	Operational impacts on people and businesses regarding: Truck movements – noise and vibration Impacts on businesses/urban areas	Auckland Council GIS
Natural Environment	4a	Landscape / Visual	Impact on natural landscape and features Natural character and outstanding natural features/landscapes Visual amenity	Auckland Council GIS
	4b	Ecology	Impact on significant Ecological Areas Indigenous biodiversity Stream/waterway/wetland ecology Coastal environment	Significant Ecological Areas Mapped stream extents
	4c	Flooding Risk	Flooding Risk	Soil types Contours Mapped flood plains Engineering assessment
	4d	Coastal inundation	Risk of coastal inundation from future sea level rise	Coastal inundation (1% AEP)
Constructability	5a	Wastewater conveyance	Length of pipe and pumping head required Size of pump station(s)	Engineering assessment
	5b	Construction risk	Complexity and risk in construction (e.g. suitability of ground conditions, ability to meet requirements of programme and staging)	Engineering assessment
Operability	6a	Operation and Maintenance - WWTP	Relative ease / complexity of operation and maintenance, technology limitations, risk of operational failures	Engineering assessment
	6b	Operation and Maintenance - conveyance	Relative ease / complexity of operation and maintenance, technology limitations, risk of operational failures	Engineering assessment
Carbon	7a	Greenhouse gas emissions	Greenhouse gas emissions generated from the construction of the wastewater treatment and conveyance infrastructure	Engineering assessment

Step 3.3 - Briefing Packs

Briefing packs were provided to technical experts, which included long list and short list assessments with an outline of the options to be assessed, the criteria to be used in undertaking this assessment including the MCA framework, and a pre-scoring spreadsheet.

Step 3.4 - Pre-Scoring

In advance of interdisciplinary workshops, technical experts were asked to pre-score options using the MCA tool so that these could be compiled and discussed during the workshop. Supporting each score was an explanation (reason) for the score.

Step 3.5 - Interdisciplinary Workshop

At the long list assessment workshop, the MCA framework and any pre-scoring outcomes were collectively reviewed. If applicable, technical experts were provided the opportunity to suggest changes to the indicative plant locations or provide input on other forms of mitigation if potential effects could be avoided and/or reduced. Initial scoring by technical experts was presented and discussed at the workshops. As part of this process, the workshop facilitator encouraged a group discussion to challenge scores and assumptions. Once complete, experts were given the opportunity to amend their scores in light of the discussion at the workshop, if they felt it was appropriate. It should be noted that while the MCA tool was used for assessment, this was not the sole means of assessing options but was complementary to the decision-making process.

Step 3.6 - Analysis and Testing of Results

Upon completion of the workshops, the Project Team met to review and test the results to ultimately determine which sites would progress to the next stage of assessment. Where necessary, technical experts were brought in to review the scores and provide additional context.

Step 3.7 - Mana Whenua Engagement

Following the identification of the sites progressing to the next stage of assessment, engagement was undertaken with mana whenua to present on the outcomes of the previous assessment. This was an opportunity for mana whenua to provide feedback on the options. This feedback was taken into account as part of deciding which sites proceeded to the short list assessment.

Step 3.8 – Community Engagement

Following the identification of the sites progressing to the next stage of assessment, engagement was undertaken with the community to present on the outcomes of the previous assessment. This was an opportunity for the public to provide feedback on the options. This feedback was taken into account as part of deciding which sites proceeded to the short list assessment.

Step 3.9 - Analysis and Testing of Results

Following the engagement period, the Project Team met to review the assessment in light of feedback received through engagement and refine the options and corresponding assessment as necessary.

4.5 Step 4 – Short List Assessment of Sites

Step 4.1 - Recommendation of Short List Options

Following the completion of steps 3.2-3.9 above, the Project Team identified seven sites to further consider through the short list assessment. The Project team carried out onsite assessments for sites B, C, S, T and Z (sites X and W were unable to be accessed).

Step 4.2 - Assessment of Short List Options

The criteria against which options were assessed at the long list was revisited by the Project Team. The purpose of this was to refine the criteria and add additional factors for consideration (where required) to undertake a more detailed assessment of the short list sites. The refined set of assessment criteria are listed in Table 2.

As with the long list assessment, the cultural criterion 1a was not scored as part of the MCA process (in response to feedback from mana whenua). However, it remains a key consideration for the short list assessment. Feedback from mana whenua was considered prior to the selection of the emerging preferred sites.

Table 2: Assessment Criteria for Shortlisted Options

Topic	Number	Criteria	Measure(s) / Potential Adverse Effects on:	Source
Cultural	1a	Cultural values	Potential effects on the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga.	Mana whenua engagement
Heritage	2a	Heritage	Sites and places of known value: Heritage buildings, places Notable trees Sites and places of European cultural heritage value	Auckland Council GIS
	2b	Archaeology	Sites and places of archaeological value.	Archaeological specialist
Social and Community	3a	Land requirement	Area of private land required Area of public land required Number of properties / special status of impacted property Consider the current use of the site, landholdings, and associated complexity (i.e. acquiring multiple single sites vs larger sites) to make up to the 30-ha requirement	Auckland Council GIS
	3b	Social impact	Impact on community facilities (e.g. schools, shops, cultural facilities) and impact on recreational facilities	Auckland Council GIS
	3c	Odour amenity	Ability to provide for a minimum 200m odour buffer within the site and number of sensitive receptors beyond 200m, but within 300m distance of the proposed site.	Odour specialist assessment
	3d	Operational effects	Operational impacts on people and businesses regarding: Truck movements – noise and vibration Impacts on businesses/urban areas	Engineering assessment
Natural Environment	4a	Landscape / Visual	Natural landscape and features such as streams, coastal edges, and natural vegetation Natural character and outstanding natural features/landscapes Visual amenity	Auckland Council GIS
	4b	Ecology	Significant indigenous flora Significant habitats of indigenous flora Indigenous biodiversity Stream/waterway/wetland ecology Coastal environment	Ecology specialist assessment
	4c	Flooding risk	Flooding risk	Mapped flood plains (Auckland Council GIS)
	4d	Risk of coastal inundation	Risk of coastal inundation from future sea level rise	Coastal inundation (1% AEP)
	4e	Highly productive land	Potential loss of highly productive land (Land Use Capability Class 1, 2 or 3)	NZ Land Resource Inventory
Constructability	5a	Wastewater conveyance	Length of pipe and pumping head required Size of pump station(s)	Engineering assessment

Topic	Number	Criteria	Measure(s) / Potential Adverse Effects on:	Source
			Construction difficulty (e.g. marine crossings)	
	5b	Construction risk	Complexity and risk in construction (e.g. suitability of ground conditions, ability to meet requirements of programme and staging)	Engineering assessment
	5c	WWTP construction footprint and other engineering considerations	Usable space available on the site including offset from coastal edge Topography Access (proximity to roads) Cut/fill earthworks balance Power requirements (proximity to HV power supply) Existing services on site Ground conditions Water supply	Engineering assessment
Operability	6a	Operation and Maintenance	Relative ease / complexity of operation and maintenance, technology limitations, risk of operational failures Start-up risk / ability to operate within standard design criteria (e.g. velocities)	Engineering assessment
	6b	Hydraulic considerations	Impact of the elevation of the proposed site and hydraulic design	Engineering assessment
	6c	Short-term serviceability	Ability to service planned development in the short-term	Engineering assessment
Greenhouse gas emissions	7a	Capital greenhouse gas emissions	Greenhouse gas emissions generated from the construction of the wastewater treatment and conveyance infrastructure	Engineering assessment
	7b	Operational greenhouse gas emissions	Greenhouse gas emissions in 2050 from network power and total emissions to 2050.	Engineering assessment
Reuse	8a	Wastewater Reuse	Ability for each site to enable future wastewater reuse	Engineering assessment

For the short list assessment, the assessment moved from classifying whether an option met or did not meet a criterion, to rating its compliance with the criteria on a gradual scale ranging from 9 being the 'best' to 1 being 'worst' (see Figure 3). The Project Team was provided with scoring guidance to assist with consistency (see Table 3). This guidance provided a rationale for assigning scores, demonstrating what level of effects may result in a score of 1-3, 4-6 or 7-9 for each criterion.

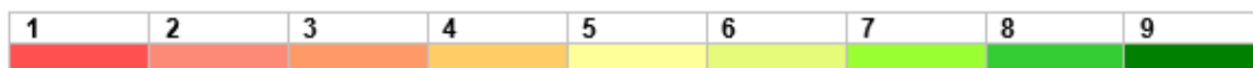


Figure 3: Scoring Scale for Short List Assessment

Scoring was completed by technical experts and the Project Team. With each score, technical experts provided a supporting narrative and summary, clearly stating the assumptions used for their assessment. Experts were also asked to comment on the level of certainty of their assessment and note where further information may be required and what additional assessments will be necessary to determine a preferred option. These scores were then presented and challenged in an interdisciplinary MCA workshop. Subsequently, some scores were changed.

Table 3: MCA Scoring Rationale

Topic	Number	Criteria	MCA Scores – Rationale for Assigning Scores (1=worst / 9 = best)		
			1-3	4-6	7-9
Cultural	1a	Cultural values	To be assessed via Mana whenua engagement and feedback separately to the MCA process.		
Heritage	2a	Heritage	High adverse effects on heritage values	Moderate adverse effects on heritage values	Low adverse effects on heritage values
	2b	Archaeology	High adverse effects on sites and places of archaeological value	Moderate adverse effects on sites and places of archaeological value	Low adverse effects on sites and places of archaeological value
Social and Community	3a	Land requirement	Scoring to be based on potential complexity of property acquisition process.		
	3b	Social impact	High adverse effects on community facilities	Moderate adverse effects on community facilities	Low adverse effects on community facilities
	3c	Odour amenity	High adverse effects on sensitive odour receptors	Moderate adverse effects on sensitive odour receptors	Low adverse effects on sensitive odour receptors
	3d	Operational effects	High adverse effects on people and businesses during operation	Moderate adverse effects on people and businesses during operation	Low adverse effects on people and businesses during operation
Natural Environment	4a	Landscape / Visual	High adverse effects on natural character and/or visual amenity	Moderate adverse effects on natural character and/or visual amenity	Low adverse effects on natural character and/or visual amenity
	4b	Ecology	High adverse effects on natural character and/or visual amenity	Moderate adverse effects on natural character and/or visual amenity	Low adverse effects on natural character and/or visual amenity
	4c	Flooding risk	High adverse effects on flooding risk, either by increasing flooding risk or locating infrastructure within the flood plain	Moderate adverse effects on flooding risk, either by increasing flooding risk or locating infrastructure within the flood plain	Low adverse effects on flooding risk, either by increasing flooding risk or locating infrastructure within the flood plain
	4d	Risk of coastal inundation	High adverse effects through potential coastal inundation	Moderate adverse effects through potential coastal inundation	Low adverse effects through potential coastal inundation
	4e	Highly productive land	High adverse effects through loss of	Moderate adverse effects through	Low adverse effects through

Topic	Number	Criteria	MCA Scores – Rationale for Assigning Scores (1=worst / 9 = best)		
			1-3	4-6	7-9
			highly productive land	loss of highly productive land	loss of highly productive land
Constructability	5a	Wastewater conveyance	Longer pipelines and greater pump station requirements High construction difficulty when compared to other sites	Moderate length pipelines and moderate pump station requirements Moderate construction difficulty when compared to other sites	Shorter pipelines and lesser pump station requirements Low construction difficulty when compared to other sites
	5b	Construction risk	High construction risk when compared to other sites	Moderate construction risk when compared to other sites	Low construction risk when compared to other sites
	5c	WWTP construction footprint and other engineering considerations	High construction footprint and difficulty when compared to other sites	Moderate construction footprint and difficulty when compared to other sites	Low construction footprint and difficulty when compared to other sites
Operability	6a	Operation and Maintenance	High level of operational and maintenance complexity (when compared to other sites)	Moderate level of operational and maintenance complexity (when compared to other sites)	Low level of operational and maintenance complexity (when compared to other sites)
	6b	Hydraulic considerations	Complex hydraulic considerations when compared to other sites	Moderate hydraulic considerations when compared to other sites	Straight forward hydraulic considerations when compared to other sites
	6c	Short-term serviceability	Low ability to service planned development in the short-term, compared to other sites	Moderate ability to service planned development in the short-term, compared to other sites	High ability to service planned development in the short-term, compared to other sites
Carbon	7a	Capital greenhouse gas emissions	High level of capital greenhouse gas emissions (when compared to other sites)	Moderate level of capital greenhouse gas emissions (when compared to other sites)	Low level of capital greenhouse gas emissions (when compared to other sites)
	7b	Operational greenhouse gas emissions	High level of operational greenhouse gas emissions (when compared to other sites)	Moderate level of operational greenhouse gas emissions (when compared to other sites)	Low level of operational greenhouse gas emissions (when compared to other sites)
Reuse	8a	Wastewater Reuse	Low potential for future wastewater	Moderate potential for future	High potential for future wastewater

Topic	Number	Criteria	MCA Scores – Rationale for Assigning Scores (1=worst / 9 = best)		
			1-3	4-6	7-9
			reuse (e.g. proximity to potential industrial uses, proximity to Kaawa aquifer, other potential reuse options), when compared to other sites.	wastewater reuse (e.g. proximity to potential industrial uses, proximity to Kaawa aquifer, other potential reuse options), when compared to other sites.	reuse (e.g. proximity to potential industrial uses, proximity to Kaawa aquifer, other potential reuse options), when compared to other sites.

Capital Cost

A capital cost estimate for each site was developed based on a common conveyance point of Boyd Road. Differences in conveyance and pump station requirements to convey treated wastewater to this common collection point prior to discharge was considered. Cost differentiators for the WWTP site itself included:

- Cut and fill volumes
- Indicative access road length
- Potentially power supply
- Risk of piling vs. simpler foundations

4.6 Step 5 – Confirmation of Preferred Site

The MCA assessment at the short-list stage identified two emerging preferred option, being Options B and Z. These two emerging compared options were then compared against each other on a qualitative basis in terms of advantages / disadvantages. Moreover, at the open day, community feedback was sought on shortlist sites, particularly the emerging preferred options.

Once the assessment of advantages and disadvantages of the two emerging preferred sites was completed and the preferred site was identified. The preferred site was also presented to mana whenua and the community.

5 Mana Whenua Engagement

Throughout the short and long list assessments, mana whenua groups were consulted with and provided feedback on the various options. This engagement is summarised in the sections below.

An established process is in place for mana whenua engagement on projects initiated by Watercare. This process includes early notification of projects to be undertaken by Watercare.

A “Kaitiaki Managers Projects List” is provided monthly to nominated representatives of all 19 mana whenua in the Auckland Council area. A summary of each project is included in the list and mana whenua are invited to indicate which projects they are interested in. Further information on the identified project is then provided to those parties, followed by further engagement depending on the responses received.

The Southwest WWTP project was included on the Kaitiaki Managers List provided to mana whenua in October 2021. Both Ngāti Te Ata and Ngāti Tamaoho were involved in the 2018 WWTP discharge consent process, therefore Watercare directly engaged with them prior to adding the Southwest WWTP project on the Kaitiaki List.

Te Ākitai Waiohū registered their interest in the Southwest WWTP project, indicating they wanted to be actively involved throughout the short list and long list process.

In addition, Te Kawerau ā Maki and Ngāti Maru sent queries to Watercare regarding the location of the WWTP, but did not register their interest. Ngāti Maru confirmed they deferred to Te Ākitai Waiohū.

A high-level summary of mana whenua engagement activities is provided in Table 4 below.

Table 4: Mana whenua engagement

Date	Mana Whenua Group	Purpose
22.07.2021	Ngāti Te Ata	Introduction to Southwest WWTP project. Meeting over MS Teams.
22.09.2021	Ngāti Te Ata	Watercare provided an update on Southwest WWTP methodology, long list criteria, short-list options. Meeting over MS Teams.
23.09.2021	Ngāti Tamaoho	Introduction to Southwest WWTP project. Meeting over MS Teams.
19.10.2021	Ngāti Maru - Geoff Cook	Query to Watercare regarding the Southwest WWTP location.
12.10.2021	Ngāti Tamaoho	Watercare provided an update, and discussion of archaeologist information. Phone call.
19.10.2021	Te Kawerau ā Maki- Edward Ashby	Query to Watercare regarding the Southwest WWTP location.
19.10.2021	Te Ākitai Waiohū - Jeff Lee	Registered interest in the Southwest WWTP project.
20.10.2021	Ngāti Maru – Geoff Cook	Ngāti Maru confirmed that they will defer to Te Ākitai Waiohū.
10.11.2021	Ngāti Tamaoho	Watercare provided a description of the WWTP site selection process and criteria.
11.11.2021	Ngāti Te Ata	Site visits to sites T, S and Z.
12.11.2021	Ngāti Tamaoho	Site visits to sites T, S and Z.
22.11.2021	Ngāti Tamaoho	Weekly meeting
10.12.2021	Ngāti Te Ata	MCA Workshop summary provided

Date	Mana Whenua Group	Purpose
13.12.2021	Ngāti Tamaoho	MCA Workshop summary provided
14.12.2021	Te Ākitai Waiohua - Jeff Lee	Watercare phoned Mr Lee and confirmed interest.
17.12.2021	Ngāti Te Ata	Watercare sent email containing pros and cons sheet for each short list site.
25.01.2022	Ngāti Tamaoho	Phone call outlining short list preferred sites.

Between February and November 2022 there were multiple meetings between Watercare and Ngāti Te Ata on the technology proposed for the WWTP. These discussions are ongoing.

The outcomes of engagement with mana whenua is outlined in Sections 7.3.1 and 7.9.1 of this Report.

6 Community Engagement

Throughout the longlist and short list stage, Watercare organised two community engagement sessions. The purpose of these sessions was to provide updates to, and to receive feedback from the local community. These community engagement sessions are described in more detail in Table 5 below. Three other engagement sessions were held with key stakeholders and these are also described in Table 5. Further community engagement material is included in Appendix C to this report.

Table 5: Community Engagement

Date	Stakeholders	Purpose
21.09.2021	Franklin Local Board	Presentation to Franklin Local Board. The presentation included an introduction to the Southwest project, project history, proposed scheme alternatives, climate impact.
29.09.2021	Community Information Session	Presentation to Community via MS Teams (due to COVID). The presentation provided an introduction to the Southwest project / methodology for site selection / long list sites presented Q&A sheet prepared in September to answer Community questions, Approximately 54 members of the local community attended the first information session.
08.10.2021	Manukau Harbour Forum	Presentation to Manukau Harbour Forum via Skype (due to COVID). The presentation included an introduction to Southwest project / methodology. In addition, the long list sites were presented.
09.11.2021	Southwest Community Liaison Group	Community Liaison Group for Southwest via MS Teams (due to COVID). This forum provided an opportunity for the community to ask questions and an update was provided to the Community Liaison Group.
14.12.2021	Community Open Day	Open day at the Clarks Beach Yacht Club where the seven shortlisted sites were presented to the community. Approximately 30 members of the community attended this presentation. 10 responses were provided through an online feedback form, 6 responses from the in person session and 6 responses were received direct by email.

The outcomes of engagement with the community is outlined in Section 7.4.1 and 7.10 of this Report.

7 Consideration of Alternative Sites

7.1 Long List Sites

The following section outlines the long list sites considered for this project. These long list sites were developed using the initial screening criteria and initial screen on parcels within a 4 km radius from the Boyd Road conveyance site (steps 1 and 2 of the alternative assessment methodology). In summary there were 26 long list sites, these are outlined in Figure 4 below. Further layouts of each long list site are contained in Appendix A.

Table 6 below provides an overview of the key features for each long list site.

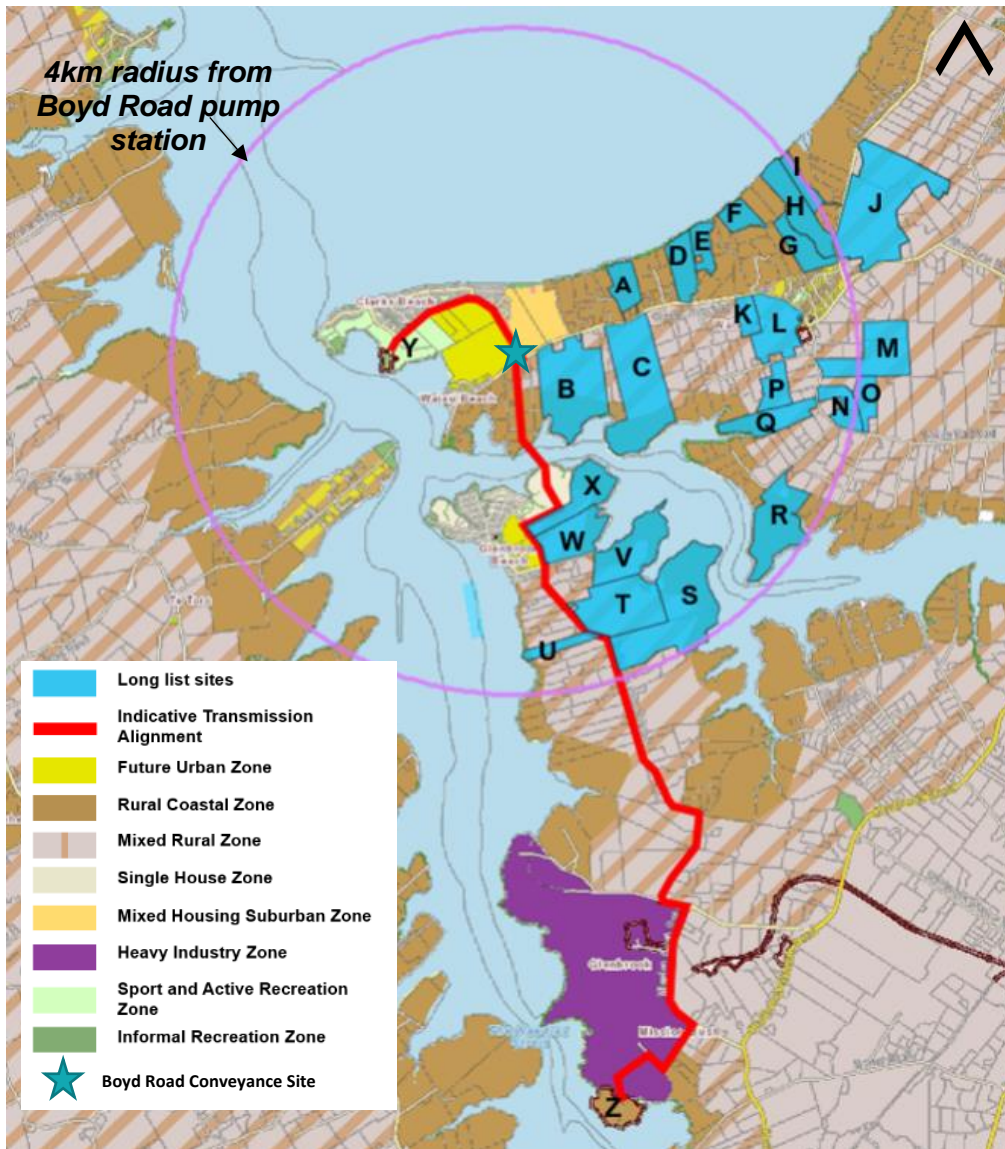


Figure 4: Location of Long List Sites

Table 6: Summary of key features of the long list sites

Site	Area (ha)	Site features
Site A	16.5	<ul style="list-style-type: none"> • Zoned under the AUP:OP as Rural Coastal Zone, Manukau Harbour coastal area. • A Terrestrial Significant Ecological Area (SEA) is located over a small north eastern portion of the site. In addition, the Marine SEA is located to the north of the site, but not within the site itself. • The northern portion of the site is subject to a coastal inundation control. • Some minor floodplains run through the site. • Adjacent to rural/lifestyle properties.
Site B	73	<ul style="list-style-type: none"> • Zoned under the AUP:OP as Rural Coastal Zone, Manukau Harbour coastal area and Mixed Rural Zone. • A Terrestrial SEA is located over a small portion of the south western side of the site. In addition, the Marine SEA is situated to the south of the site, but not within the site itself. • A small portion of the site's southern side is subject to a coastal inundation control. • Some minor floodplains run through the site. • Adjacent to rural/lifestyle properties.
Site C	87	<ul style="list-style-type: none"> • Zoned under the AUP:OP as Rural Coastal Zone, Manukau Harbour coastal area and Mixed Rural Zone. • Does not include any overlays, but a Marine SEA is located to the south of the site. • A small portion of the site's southwestern side is subject to a coastal inundation control. • Some minor floodplains run through the site. • Adjacent to rural/lifestyle properties.
Site D	20.2	<ul style="list-style-type: none"> • Zoned under the AUP:OP as Rural Coastal Zone, Manukau Harbour coastal area. • A Terrestrial SEA over the northern portion of the site. In addition, a Marine SEA is located to the north of the site, but not within the site itself. • The northern portion of the site is subject to a coastal inundation control. • Some minor floodplains run through the site. • Adjacent to rural/lifestyle properties.
Site E	12.5	<ul style="list-style-type: none"> • Zoned under the AUP:OP as Rural Coastal Zone, Manukau Harbour coastal area. • The site has a Terrestrial SEA over the northern portion of the site. In addition, the Marine SEA is located to the north of the site, but not within the site itself. • The northern portion of the site is subject to a coastal inundation control. • Floodplains cover a large portion of the site. • Adjacent to several rural/lifestyle properties.
Site F	12.4	<ul style="list-style-type: none"> • Zoned under the AUP:OP as Rural Coastal Zone, Manukau Harbour coastal area. • Site F does not include any overlays; however, a Marine SEA is located north of the site. • Coastal inundation controls apply to a large portion of the site. • Floodplains cover majority of the site. • Adjacent to rural/lifestyle properties.
Site G	18.2	<ul style="list-style-type: none"> • Zoned under the AUP:OP as Rural Coastal Zone, Manukau Harbour coastal area. • Site G does not include any overlays or relevant controls.

Site	Area (ha)	Site features
		<ul style="list-style-type: none"> Some minor floodplains run through the site. Close to rural/lifestyle properties and the Waiau Pa settlement.
Site H	31.8	<ul style="list-style-type: none"> Zoned under the AUP:OP as General Coastal Marine Zone, and Rural Coastal Zone, Manukau Harbour coastal area. Site has 2 overlays, Marine SEA and the Significant Wading Bird Area SEA. A coastal inundation controls applies to a large portion of the site. Floodplains cover a large portion of the site. Site is not directly adjacent to any rural/lifestyle properties
Site I	10.89	<ul style="list-style-type: none"> Zoned under the AUP:OP as Rural Coastal Zone, Manukau Harbour coastal area. Site I does not include any AUP:OP overlays, but the Marine SEA is located to the south of the site. A coastal inundation control applies to a large portion of the site. Floodplains cover a large portion of the site. Adjacent to rural/lifestyle properties.
Site J	104.9	<ul style="list-style-type: none"> Zoned under the AUP:OP as Mixed Rural Zone. Site J does not include any AUP:OP overlays or relevant controls. Some minor floodplains run through the site. The site is adjacent to rural/lifestyle properties.
Site K	10.5	<ul style="list-style-type: none"> Zoned under the AUP:OP as Mixed Rural Zone. Site K does not include any AUP:OP overlays or relevant controls. Some minor floodplains run through the site. Adjacent to rural/lifestyle properties.
Site L	34.97	<ul style="list-style-type: none"> Zoned under the AUP:OP as Mixed Rural Zone. Site L does not include any AUP:OP overlays or relevant controls. Floodplains run through the centre of the site. Adjacent to Waiau Pa school, with a residential catchment to the northeast of the site.
Site M	46	<ul style="list-style-type: none"> Zoned under the AUP:OP as Mixed Rural Zone. Site M does not include any AUP:OP overlays or relevant controls. Floodplains run through the centre of the site. The site is in close proximity to rural/lifestyle properties.
Site N	16.1	<ul style="list-style-type: none"> Zoned under the AUP:OP as Mixed Rural Zone. Site N has 1 overlay, a small portion of the site is over the High-Use Aquifer Management Area – Glenbrook Kaawa Aquifer. The site is not subject any relevant controls. Some minor floodplains run through the site. Adjacent to rural/lifestyle properties.
Site O	12.8	<ul style="list-style-type: none"> Zoned under the AUP:OP as Mixed Rural Zone. Site N has 1 overlay, a small portion of the site is over the High-Use Aquifer Management Area – Glenbrook Kaawa Aquifer. Floodplain runs through the centre of the site. The site is not directly adjacent to rural/lifestyle properties.
Site P	15.5	<ul style="list-style-type: none"> Zoned under the AUP:OP as Mixed Rural Zone. Site P does not include any AUP:OP overlays or relevant controls. Some minor floodplains run through the site. Adjacent to rural/lifestyle properties.
Site Q	25.4	<ul style="list-style-type: none"> Zoned under the AUP:OP as Mixed Rural Zone and Rural Coastal Zone, Manukau Harbour coastal area. Site Q does not include any AUP:OP overlays or relevant controls, but the Marine SEA is located west of the site.

Site	Area (ha)	Site features
		<ul style="list-style-type: none"> Some minor floodplains run through the site. The site is not directly adjacent to rural/lifestyle properties.
Site R	49.6	<ul style="list-style-type: none"> Zoned under the AUP:OP as Mixed Rural Zone, General Coastal Zone, and Rural Coastal Zone, Manukau Harbour coastal area. Site R has 2 overlays, a Marine SEA is over a small portion of the site, and the entire site is over a High-Use Management Area – Glenbrook Kaawa Aquifer. A small portion of the site is subject to a coastal inundation control. Some minor floodplains run through the site. Adjacent to rural/lifestyle properties.
Site S	93.3	<ul style="list-style-type: none"> Zoned under the AUP:OP as General Coastal Marine Zone, Rural Coastal Zone, Manukau Harbour coastal area, and Mixed Rural Zone. Site S has 3 overlays, 2 Marine SEAs (Significant wading bird area and Marine 2), and the site is over the High-Use Aquifer Management Area Overlay – Glenbrook Kaawa Aquifer. Parts of the site are subject to a coastal inundation control. Some minor floodplains run through the site. Adjacent to rural/lifestyle properties.
Site T	56	<ul style="list-style-type: none"> Zoned under the AUP:OP as General Coastal Marine Zone, Rural Coastal Zone, Manukau Harbour coastal area, and Mixed Rural Zone. Site T has 3 overlays, 2 Marine SEAs (Significant wading bird area and Marine 2), and the site is over the High-Use Aquifer Management Area Overlay – Glenbrook Kaawa Aquifer. Parts of the site are subject to a coastal inundation control. Floodplain runs through the centre of the site. Adjacent to rural/lifestyle properties.
Site U	10.2	<ul style="list-style-type: none"> Zoned under the AUP:OP as General Coastal Marine Zone, Rural Coastal Zone, Manukau Harbour coastal area, and Mixed Rural Zone. Site U has 3 overlays, 2 Marine SEAs (Significant wading bird area and Marine 2), and the site is over the High-Use Aquifer Management Area Overlay – Glenbrook Kaawa Aquifer. Parts of the site are subject to a coastal inundation control. Floodplain runs through the centre of the site. Adjacent to rural/lifestyle properties.
Site V	41.6	<ul style="list-style-type: none"> Zoned under the AUP:OP as General Coastal Marine Zone, Rural Coastal Zone, Manukau Harbour coastal area, and Mixed Rural Zone. Site V has 3 overlays, 2 Marine SEAs (Significant wading bird area and Marine 2), and the site is over the High-Use Aquifer Management Area Overlay – Glenbrook Kaawa Aquifer. Parts of the site are subject to a coastal inundation control. Some minor floodplains run through the site. Site is not adjacent to rural/lifestyle properties.
Site W	33.8	<ul style="list-style-type: none"> Zoned under the AUP:OP as Mixed Rural Zone and Rural Coastal Zone, Manukau Harbour Coastal area. Site W has 1 overlay, the site is over the High-Use Aquifer Management Area Overlay – Glenbrook Kaawa Aquifer. Parts of the site are subject to a coastal inundation control. Some minor floodplains run through the site. Site is not adjacent to rural/lifestyle properties; however, adjacent to the Future Urban Zone.

Site	Area (ha)	Site features
Site X	32.4	<ul style="list-style-type: none"> • Zoned under the AUP:OP as Rural Zone and Rural Coastal Zone, Manukau Harbour Coastal area. • Site X has 1 overlay, the site is over the High-Use Aquifer Management Area Overlay – Glenbrook Kaawa Aquifer. • Parts of the site are subject to a coastal inundation control. • Some minor floodplains run through the site. • The site is not adjacent to rural/lifestyle properties.
Site Y	2.9	<ul style="list-style-type: none"> • Zoned under the AUP:OP as Informal Recreation Zone. • Site Y does not include any overlays, but is adjacent to ecological SEA. • Some minor floodplains run through the site. • The site is not adjacent to rural/lifestyle properties.
Site Z	17.4	<ul style="list-style-type: none"> • Zoned under the AUP:OP as Rural Coastal Zone, Manukau Harbour coastal area. • ,The site is over the High-Use Aquifer Management Area Overlay – Glenbrook Kaawa Aquifer. • Parts of the site are subject to coastal inundation. • Some minor floodplains run through the site. • The site is not adjacent to rural/lifestyle properties. • This site includes the existing designated WWTP at Waiuku.

7.2 Assessment of Long List Sites

As outlined in the methodology section (Section 4), the long list sites were subject to a traffic light assessment against a range of criteria. Technical specialists engaged in a half day workshop (on-line) to rank each site green, amber, or red depending on how well that site met the criteria. Refer to Appendix B for more detail on this assessment.

Table 7: Summary of long list option assessment

Long list assessment		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z		
Cultural Values	1a. Cultural values	Scored separately																											
	Heritage	2a. Heritage	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Social and community	3a. Land requirement	Amber	Green	Green	Amber	Amber	Amber	Amber	Amber	Amber	Amber	Amber	Green	Amber	Amber	Amber	Amber	Amber	Amber	Amber	Amber	Amber	Amber	Amber	Amber	Amber	Amber	Amber	
	3b. Social impact	Green	Green	Amber	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	
	3c. Odour amenity	Red	Green	Amber	Red	Red	Red	Red	Red	Amber	Red	Red	Red	Green	Red	Amber	Red	Red	Red	Green	Green	Green	Red	Green	Amber	Amber	Red	Green	
	3d. Operational effects	Amber	Green	Green	Green	Red	Red	Red	Green	Red	Red	Red	Red	Green	Green	Green	Green	Green	Green	Green	Green	Green	Red	Green	Green	Green	Green	Green	
Natural environment	4a. Landscape / visual	Amber	Green	Amber	Amber	Amber	Amber	Amber	Green	Amber	Amber	Amber	Green	Amber	Amber	Amber	Amber	Amber	Amber	Amber	Amber	Amber	Amber	Amber	Amber	Amber	Amber		
	4b. Ecology	Amber	Amber	Amber	Red	Red	Amber	Green	Amber	Amber	Amber	Amber	Green	Green	Green	Amber	Amber	Amber	Amber	Amber	Amber	Amber	Amber	Amber	Amber	Amber	Amber		
	4c. Flooding risk	Amber	Amber	Amber	Amber	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	
	4d. Coastal inundation	Amber	Green	Green	Amber	Amber	Red	Green	Red	Red	Red	Red	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	
Constructability	5a. Wastewater conveyance	Amber	Green	Green	Amber	Amber	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Amber	Amber	Amber	Green	Green	Green	Green	Green	Red	
	5b. Construction risk	Green	Green	Amber	Amber	Amber	Amber	Amber	Amber	Amber	Amber	Green	Green	Green	Green	Green	Green	Green	Green	Amber	Red	Red	Red	Red	Red	Amber	Red	Amber	
Operability	6a. Operation and maintenance – WWTP	Red	Green	Green	Red	Red	Red	Red	Red	Red	Amber	Red	Amber	Amber	Red	Red	Red	Red	Red	Green	Green	Green	Red	Green	Green	Green	Red	Amber	
	6b. Operation and maintenance – conveyance	Green	Green	Green	Amber	Amber	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Amber	Amber	Red	Red	Red	Red	Red	Red	Red	
Carbon	7a. Greenhouse gas emissions	Green	Green	Green	Amber	Amber	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Amber	Amber	Amber	Amber	Amber	Green	Red	

The Project Team reviewed and compared the options identified above. Table 8 summarises the assessment of the long list options against the six criteria topics – heritage, social and community, natural environment, constructability, operability and carbon.

Table 8: Assessment of long list sites

Topic	Assessment
Heritage	<p>a. Most sites had no known historic heritage sites except Site L which was identified as being in proximity to Historic Heritage Overlay Place – 1551, Waiau Pa War Memorial Monument.</p>
Social and community	<p>b. From a land requirement perspective, sites large enough to provide for the treatment plant generally met the criteria well. Sites less than 30 ha only marginally met the criteria. While these sites are likely to provide for sufficient land for treatment, additional land is expected to be required to provide an appropriate buffer from adjacent properties.</p> <p>c. From a social impact perspective, there were no real differentiators between the sites, except sites located in proximity to community and recreational facilities, which marginally met the criteria.</p> <p>d. From an odour perspective sites able to achieve a buffer distance of 200 m from the WWTP to the site boundary and 300 m from the WWTP to nearby residential dwellings met the criteria well. Sites that achieved a 200 m buffer distance between the WWTP and the site boundary but not a 300 m buffer distance to nearby residential dwelling marginally met the criteria. Sites where neither buffer distances can be achieved did not meet the criteria.</p> <p>e. From an operational effects perspective, sites that were able to provide sufficient distance from sensitive receivers and had good access generally met the criteria well. Sites with minor anticipated operational effects marginally met the criteria. Sites with significant anticipated operational effects due to poor accessibility and proximity to the Waiau Pa Settlement did not meet the criteria.</p>
Natural environment	<p>a. From a landscape and visual perspective, sites providing a sufficient buffer distance from neighbouring sites met the criteria well. Sites where the proposed WWTP would impact natural landscape and features and adjacent properties only marginally met the criteria.</p> <p>b. From an ecology perspective, sites where minor adverse effects on natural features were anticipated met the criteria well. Sites with moderate adverse effects on natural and landscape features were ranked lower, while sites with significant impacts on ecological features were ranked the lowest.</p> <p>c. From a flooding risk perspective, there were no key differentiators between the sites, with the exception of sites with significant flood constraints, which only marginally met the criteria</p> <p>d. From a coastal inundation perspective, sites subject to no or very little coastal inundation met the criteria well. Sites with minor coastal inundation only marginally met the criteria, while sites with significant coastal inundation risk did not meet the criteria.</p>

Topic	Assessment
Constructability	<p>a. From a wastewater conveyance perspective, sites that require reduced piping lengths and were in close proximity to the Boyd Road conveyance site met the criteria well. Sites further from the Boyd Road conveyance site that require longer piping lengths and more complex pumping stations only marginally met the criteria.</p> <p>b. From a construction risk perspective, sites with less construction complexity and risk (e.g. suitability of ground conditions, ability to meet requirements of programme and staging, potential effects associated with dust, noise and vibration), met the criteria well. Sites with high construction complexity and risk only marginally met the criteria.</p>
Operability	<p>a. From an operation and maintenance – WWTP perspective, sites that were of a sufficient size, relatively flat and generally provide ease of operation and maintenance met the criteria well. Smaller sites, where WWTP operation and maintenance was complex, only marginally met the criteria.</p> <p>b. From an operation and maintenance – conveyance perspective, sites with lower pipe length, lower start-up flows and sites generally able to provide ease of operation and maintenance met the criteria well. Sites where conveyance operation and maintenance is highly complex only marginally met the criteria.</p>
Carbon	<p>a. From a greenhouse gas emissions perspective, sites requiring lower pipe lengths and lower embedded carbon met the criteria well. Site with higher emissions generated from the construction of the WWTP only marginally met the criteria.</p>

Based on the assessment above, sites **B, C, S, T, W, X** and **Z** proceeded to the short list stage for the following key reasons:

- a) These sites are mostly larger sites and achieve the minimum odour buffer of 200 m (within the site). The 300m odour buffer to sensitive receptors (i.e. residential properties) requires additional assessment at the short-list stage.
- b) These sites (with the exception of site Z) were relatively close to the Boyd Road conveyance site and/or the proposed transmission pipeline from Waiuku and were thus preferred from an engineering and constructability perspective.
- c) These sites are large and have a relatively flat topography, as such these sites were preferred from an operation and maintenance perspective.
- d) Site Z proceeded to the short list stage as it provided greater certainty around timing and operation as it is an existing designated site and scored well on a number of parameters
- e) Due to the large size of the sites, the WWTP is able to be located away from culturally sensitive headlands.

It is worth noting that some sites that proceeded to the short list did not meet all the criteria (i.e. had one or more criteria scored as red in Table 8). Only sites B and C either met the criteria well or marginally met the criteria across all topics. Sites S, T, W, X and Z were still considered at the short list stage as they demonstrated strong positive features that warranted further investigation. In addition, sites that were not considered further had some challenges or constraints. While the sites that proceeded to the short list may have had some constraints, they were not significant enough to prevent further investigation.

7.3 Mana Whenua Engagement

Following the assessment of the long list options, engagement was undertaken with mana whenua and the community to present on the outcomes of the long list assessment and discuss next steps. This was an opportunity for mana whenua and the public to provide feedback on the options. More information regarding mana whenua and community engagement can be found in Appendix C.

As mentioned in Section 5, Ngāti Te Ata, Ngāti Tamaoho and Te Ākitai Waiohua notified their interest in this project. Mana whenua engagement is outlined in Table 4 (see Section 5) and spanned from June 2021 to January 2022. Te Ākitai Waiohua have not provided a response to date.

Ngāti Te Ata

On the 22nd of September 2021, Watercare provided an update to Ngāti Te Ata regarding the long list assessment. During the meeting, the following feedback was provided by Ngāti Te Ata:

- The need to understand the local environmental impacts, particularly stormwater (quality, quantity and flows) effects, landscape and visual effects (particularly from the other side of the harbour), and the planting of buffer zones.
- Ngāti Te Ata supported the use of the best dewatering technologies.
- Scallop beds located adjacent to sites A and D are culturally significant.
- Ngāti Te Ata indicated the site X is not an ideal site due to its proximity to the Kahawai Point development
- In addition, Ngāti Te Ata indicated to Watercare that a Pa site is present on the edge of the Taihiki River and that all shortlisted sites are of significance.
- The southern portion of sites B and C are traditional food gathering sites and are therefore of significance to Ngāti Te Ata.

Ngāti Tamaoho

On the 23rd of September 2021, Watercare provided an update to Ngāti Tamaoho regarding the longlist assessment. During the meeting, the following feedback was provided by Ngāti Tamaoho:

- Ngāti Tamaoho supports an archaeological survey to be undertaken for each of the shortlisted sites.
- Ngāti Tamaoho indicated that all coastal areas were not preferred due to the high cultural significance of these areas, particularly headland sites. Ngāti Tamaoho indicated they would not support WWTP locations close to the coast.

As a result of these discussions, sites large enough to locate the WWTP away from culturally sensitive headlands were selected.

7.4 Community Feedback

Feedback was received from the community open day on the long list options. As part of this feedback, it was queried why parcels on the Awhitu Peninsula, to the west of the Waiuku River, were not adequately considered. The Project Team considered this feedback warranted further investigation and accordingly identified nine additional sites that met the initial screening criteria, but were located to the west of the Waiuku River. These additional nine sites are summarised and assessed below. Refer to Appendix D for more detail on the additional long list assessment.

7.4.1 Additional long list sites

Figure 5 below shows the location of the nine additional long list sites. Key features of the additional nine sites are described in Table 9.

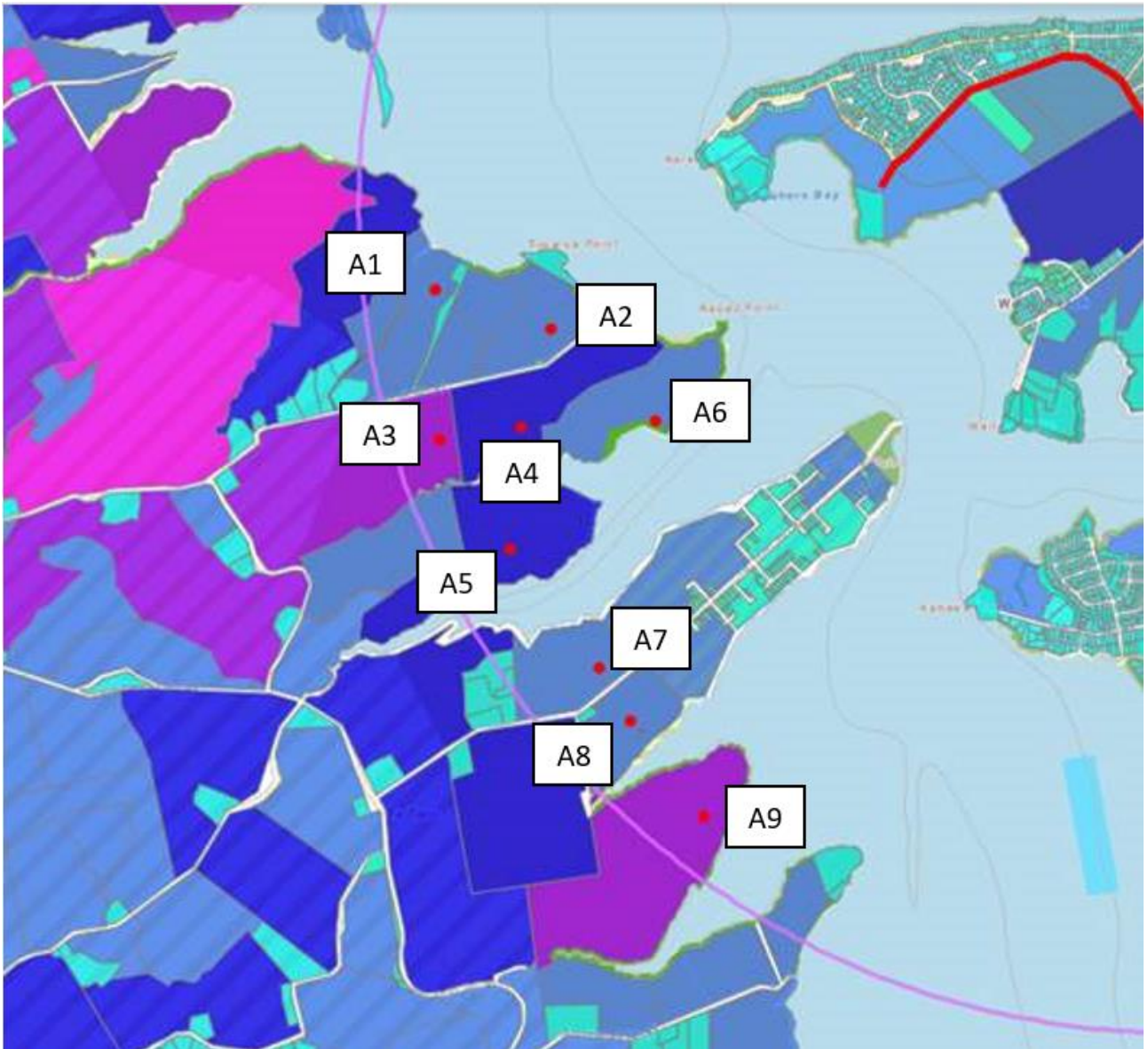


Figure 5: Additional long list sites

Table 9: Summary of key features of the additional long list sites

Site	Area (ha)	Site features
Site A1	21.1	<ul style="list-style-type: none"> • Zoned under the AUP:OP as Rural Coastal Zone, Manukau Harbour coastal area and General Coastal Marine Zone. • Site 1 has one overlays, a Marine SEA over the northern portion of the site and the site is over High-Use Aquifer Management Area – Awhitu Sand Aquifer. • The northern portion of the site is subject to a coastal inundation control. • Some minor floodplains run through the site. • Adjacent to rural/lifestyle properties.
Site A2	16.8	<ul style="list-style-type: none"> • Zoned under the AUP:OP as Rural Coastal Zone, Manukau Harbour coastal area and General Coastal Marine Zone. • Site A2 has one overlay, the site is over High-Use Aquifer Management Area – Awhitu Sand Aquifer. In addition, the Marine SEA is situated to the northwest of the site, but not within the site itself. • A small portion of the site’s north eastern side is subject to a coastal inundation control. • Some minor floodplains run through the site. • Adjacent to rural/lifestyle properties.
Site A3	60	<ul style="list-style-type: none"> • Zoned under the AUP:OP as Rural Coastal Zone, Manukau Harbour coastal area and Mixed Rural Zone. • Site A3 has two overlays, a Terrestrial SEA is over a small portion of the site, and the entire site is over a High-Use Management Area – Awhitu Sand Aquifer. • A small portion of the site’s south eastern side is subject to a coastal inundation control. • Some minor floodplains run through the site. • Adjacent to rural/lifestyle properties.
Site A4	31.3	<ul style="list-style-type: none"> • Zoned under the AUP:OP as Rural Coastal Zone, Manukau Harbour coastal area and General Coastal Marine Zone. • Site A4 has two overlays, a Terrestrial SEA is over a small portion of the site, and the entire site is over a High-Use Management Area – Awhitu Sand Aquifer. • A portion of the site’s north eastern and southern sides are subject to a coastal inundation control. • Some minor floodplains run through the site. • Adjacent to rural/lifestyle properties.
Site A5	39.5	<ul style="list-style-type: none"> • Zoned under the AUP:OP as Rural Coastal Zone, Manukau Harbour coastal area and General Coastal Marine Zone. • Site A5 has two overlays, a Terrestrial SEA is over a small portion of the site, and the entire site is over a High-Use Management Area – Awhitu Sand Aquifer. • Most of the site’s coastal perimeter sides is subject to a coastal inundation control. • Some minor floodplains run through the site. • Adjacent to rural/lifestyle properties.
Site A6	26.7	<ul style="list-style-type: none"> • Zoned under the AUP:OP as Rural Coastal Zone, Manukau Harbour coastal area and General Coastal Marine Zone. • Site A6 has two overlays, a Terrestrial SEA on the site’s southern side and the entire site is over a High-Use Management Area – Awhitu Sand Aquifer.

Site	Area (ha)	Site features
		<ul style="list-style-type: none"> • A portion of the site's northern and southern sides are subject to a coastal inundation control. • Some minor floodplains run through the site. • Adjacent to rural/lifestyle properties and an esplanade reserve.
Site A7	20	<ul style="list-style-type: none"> • Zoned under the AUP:OP as Rural Coastal Zone, Manukau Harbour coastal area. • Site A6 has one overlay, the entire site is over a High-Use Management Area – Awhitu Sand Aquifer. • A portion of the site's northern side is subject to a coastal inundation control. • Some very minor floodplains run through the site. • Adjacent to rural/lifestyle properties.
Site A8	17.8	<ul style="list-style-type: none"> • Zoned under the AUP:OP as Rural Coastal Zone, Manukau Harbour coastal area and Coastal Marine Zone • Site A8 has two overlays, a Marine SEA is included on the site and majority of the site is over a High-Use Management Area – Awhitu Sand Aquifer. • A portion of the site's northern side is subject to a coastal inundation control. • Some very minor floodplains run through the site. • Adjacent to rural/lifestyle properties.
Site A9	60	<ul style="list-style-type: none"> • Zoned under the AUP:OP as Rural Coastal Zone, Manukau Harbour coastal area and Coastal Marine Zone. • Site A9 has two overlays, a Marine SEA is included on the site and the entire site is over a High-Use Management Area – Awhitu Sand Aquifer. • The coastal permitter of the site is subject to coastal inundation controls. • Some minor floodplains run through the site. • Adjacent to rural/lifestyle properties.

The Project Team reviewed and compared the nine additional sites. The following table summarises the assessment of the long list options against the six criteria topics – heritage, social and community, natural environment, constructability, operability and carbon:

Table 10: Traffic Light Summary – nine additional long-list sites

Additional site long list assessment		A1	A2	A3	A4	A5	A6	A7	A8	A9
Cultural	1a Cultural values	Scored separately								
Heritage	2a. Heritage	Green	Green	Green	Green	Green	Green	Green	Green	Green
Social and community	3a. Land requirement	Yellow	Yellow	Green	Green	Green	Yellow	Yellow	Yellow	Green
	3b. Social impact	Yellow	Yellow	Green	Green	Green	Yellow	Green	Green	Yellow
	3c. Odour amenity	Red	Yellow	Green	Yellow	Green	Green	Yellow	Yellow	Green

Additional site long list assessment		A1	A2	A3	A4	A5	A6	A7	A8	A9
	3d. Operational effects	Red	Yellow	Green	Yellow	Green	Green	Yellow	Yellow	Green
Natural environment	4a. Landscape / visual	Yellow	Yellow	Yellow	Yellow	Green	Yellow	Yellow	Yellow	Green
	4b. Ecology	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
	4c. Flooding risk	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Yellow
	4d. Coastal inundation	Yellow	Yellow	Green	Yellow	Yellow	Yellow	Green	Green	Yellow
Constructability	5a. Wastewater conveyance	Red	Red	Red	Red	Red	Red	Red	Red	Red
	5b. Construction risk	Red	Red	Red	Yellow	Red	Red	Yellow	Red	Red
Operability	6a. Operation and maintenance – WWTP	Red	Red	Red	Red	Red	Red	Red	Red	Red
	6b. Operation and maintenance – conveyance	Red	Red	Red	Red	Red	Red	Red	Red	Red
Carbon	7a. Greenhouse gas emissions	Red	Yellow	Red	Yellow	Red	Green	Yellow	Red	Red

Following the assessment of the additional long list sites, the Project Team determined that the nine options should not be progressed to the short list stage for the following reasons:

- These options have considerable constructability issues as they are located at a greater distance from the Boyd Road conveyance site and the Clarks Beach outfall. Therefore, these options require longer conveyance pipelines, more assets, and potentially more complex marine crossings under the Waiuku River. This is also likely to increase the construction risk and overall costs.
- These options were not preferred by mana whenua due to the additional crossings required under the Waiuku River.
- These options are to the west of the Waiuku River and are located further from the communities the WWTP seeks to service – Waiuku, Glenbrook, Clarks Beach and Kingseat. This will result in additional operational complexities (e.g. travel).

7.5 Short List Options

7.5.1 Overview

As outlined in Section 7.2, following the completion of the long list assessment, the Project Team identified seven sites to further consider through the short list assessment. An overview of these sites is identified in Figure 6 below. The sections to follow include indicative plans showing potential layout options for the MBR

WWTP, a future wastewater reuse plant, and a potential area for treated wastewater storage (pond) (as required by the regional discharge consent). Refer to Appendix E for more detail on these indicative site layouts for each of the shortlisted sites. These layouts and conveyance route options are indicative and subject to change as the Project progresses.



Figure 6: Overview locality plan (short list sites)

Site B

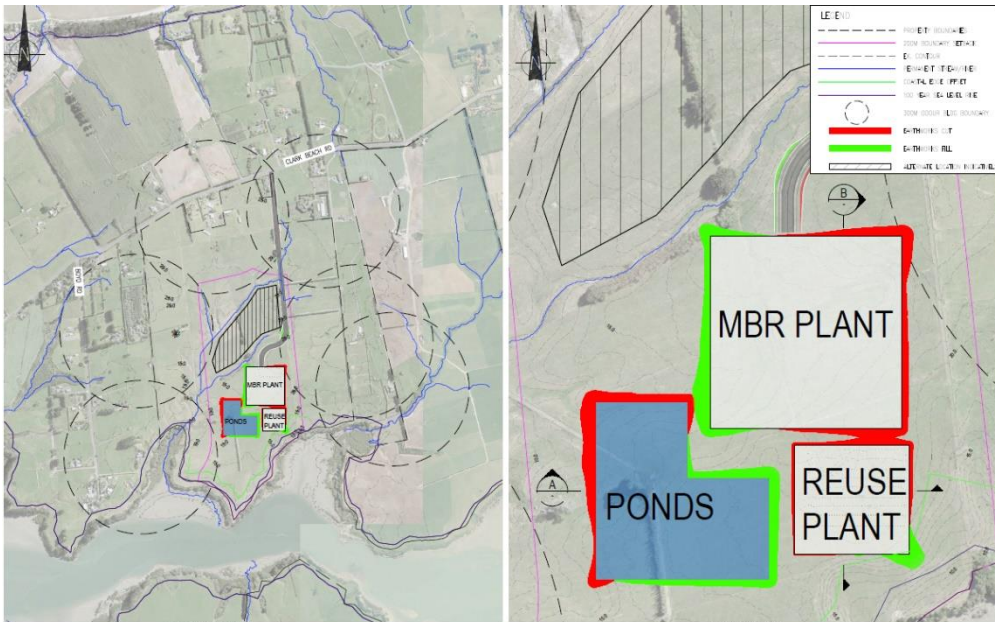


Figure 7: Site B indicative site layout (refer to Appendix E for more detailed plans). Hashed area shows possible alternative WWTP location, dashed circles show 300m from existing residential dwelling.

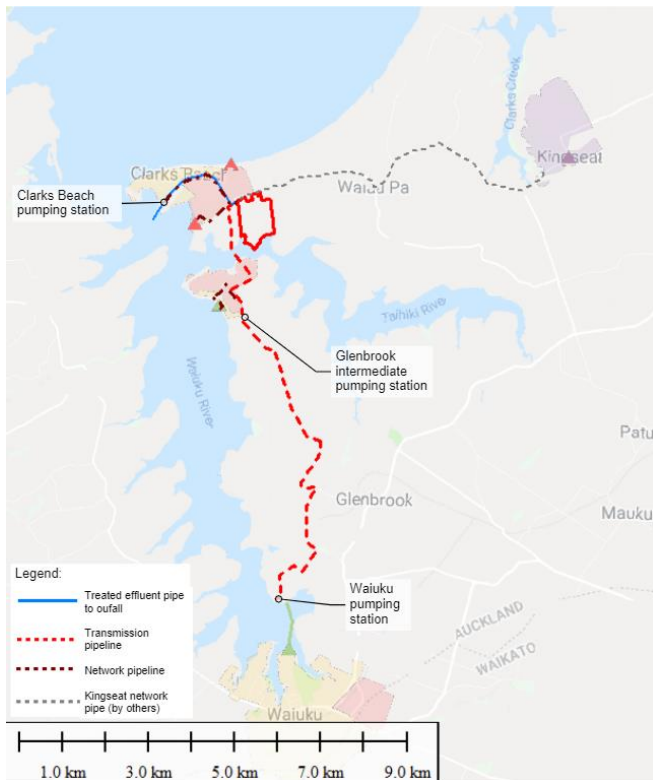


Figure 8: Site B indicative scheme plan

Site C

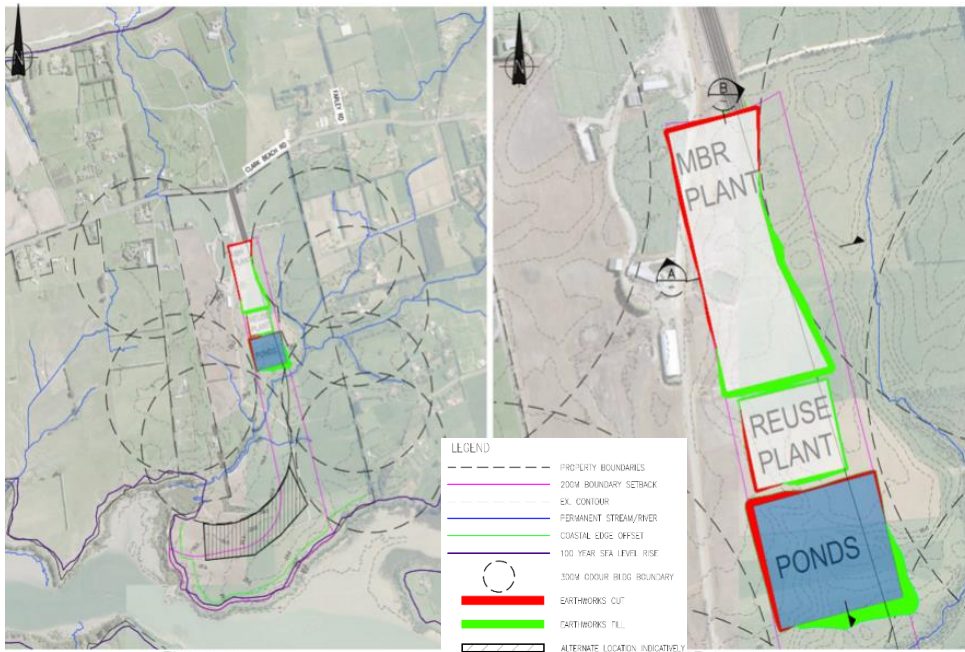


Figure 9: Site C indicative site layout (refer to Appendix D for more detailed plans). Hashed area shows possible alternative WWTP location, dashed circles show 300m from existing residential dwelling.

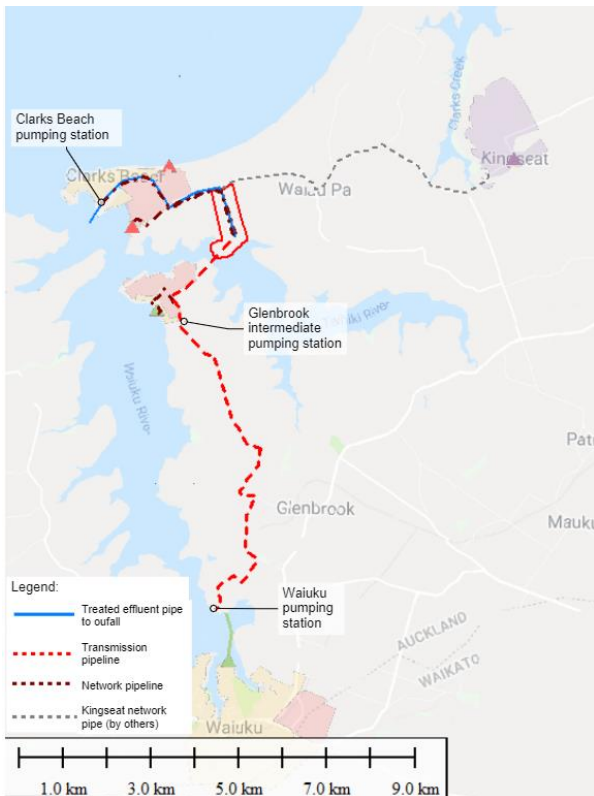


Figure 10: Site C indicative scheme plan

Site S



Figure 11: Site S indicative site layout (refer to Appendix D for more detailed plans). Hashed area shows possible alternative WWTP location, dashed circles show 300m from existing residential dwelling.

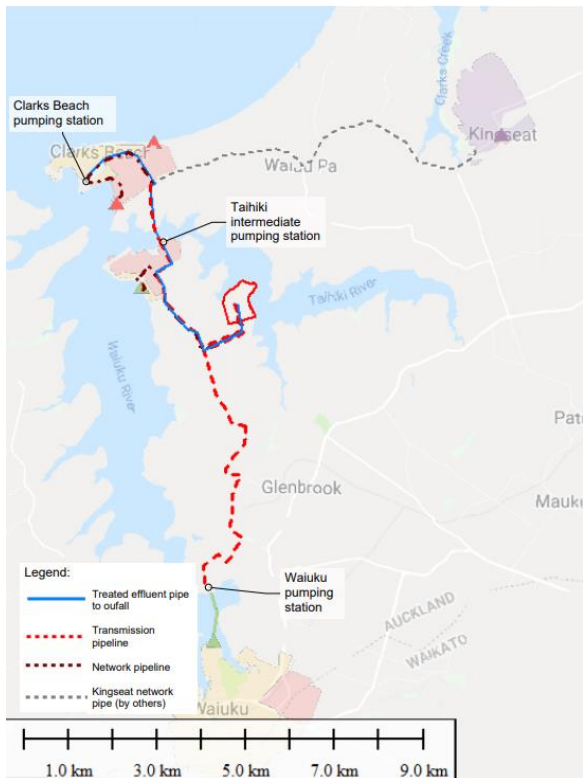


Figure 12: Site S indicative scheme plan

Site T



Figure 13: Site T indicative site layout (refer to Appendix D for more detailed plans). Dashed circles show 300m from existing residential dwelling.

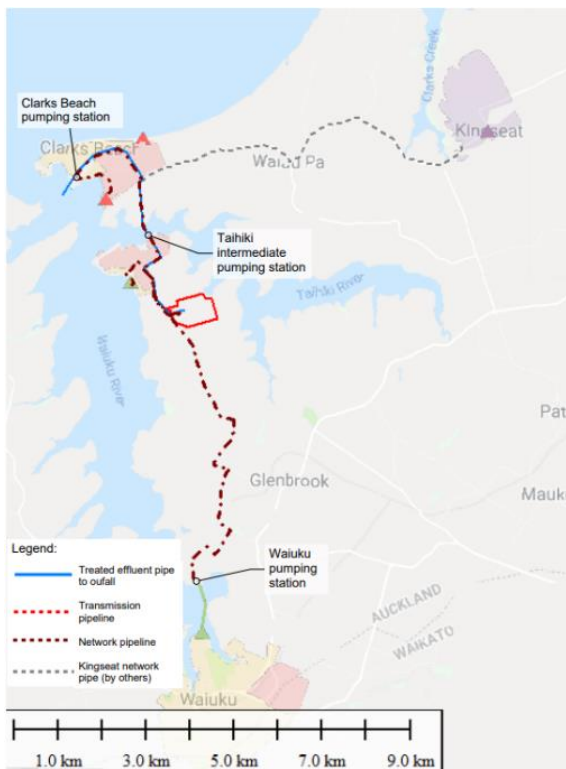


Figure 14: Site T indicative scheme plan

Site W

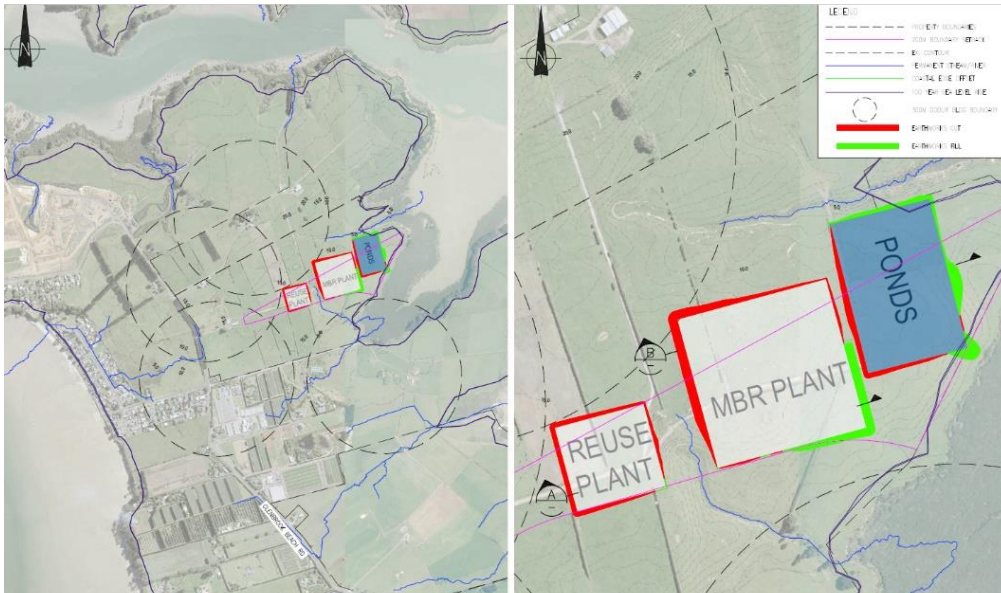


Figure 15: Site W indicative site layout. Dashed circles show 300m from existing residential dwelling.

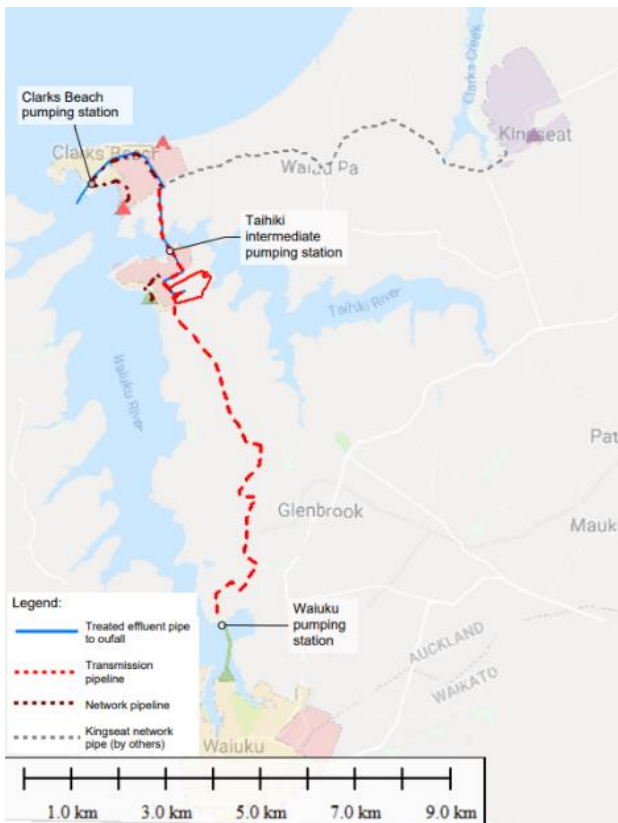


Figure 16: Site W indicative scheme plan

Site X

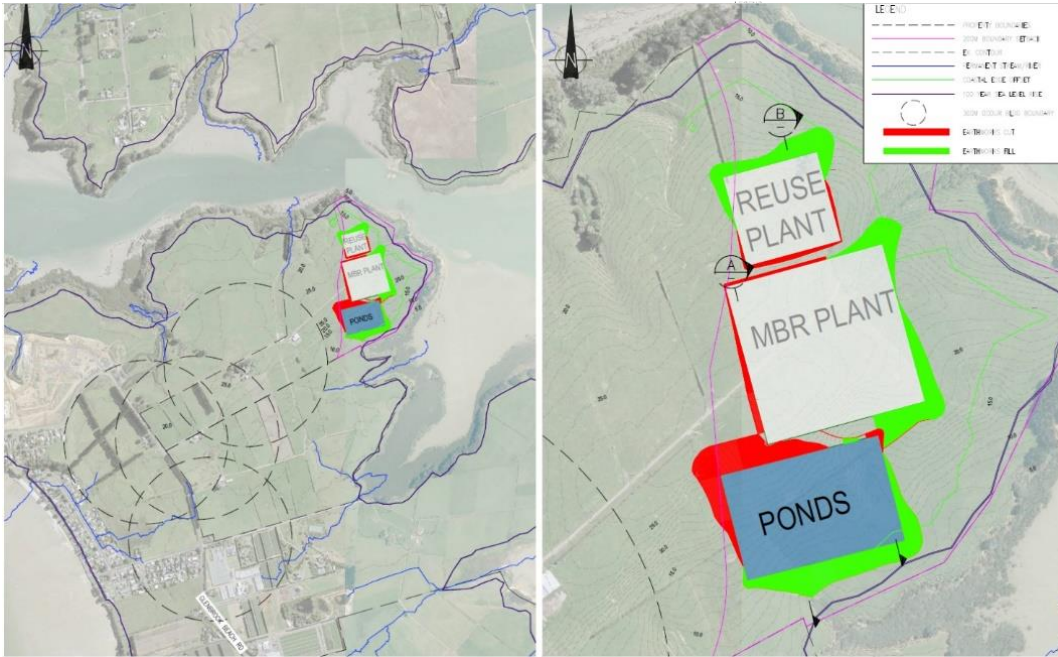


Figure 17: Site X indicative site layout (refer to Appendix D for more detailed plans). Dashed circles show 300m from existing residential dwelling.

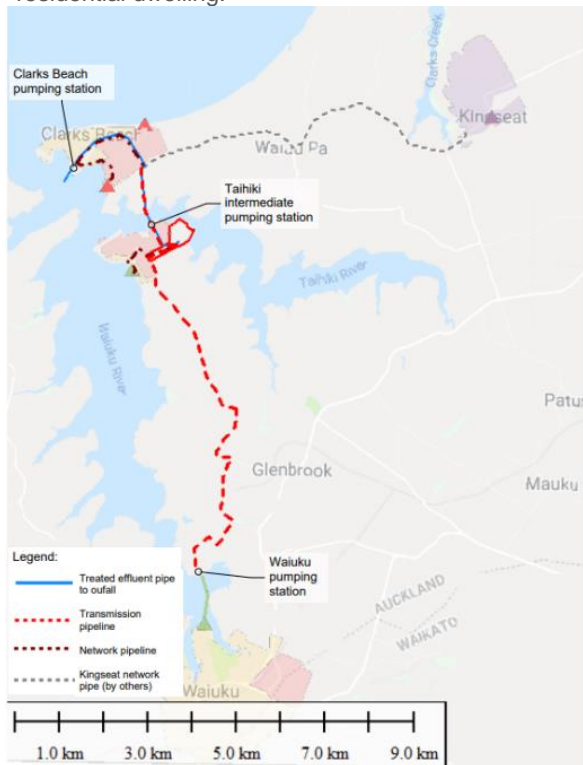


Figure 18: Site X indicative scheme plan

Site Z



Figure 19: Site Z indicative site layout. (refer to Appendix D for more detailed plans).

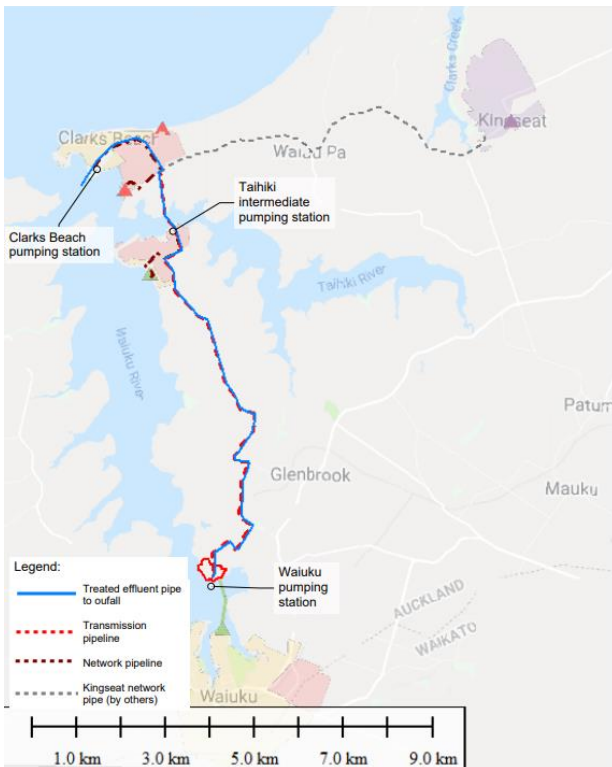


Figure 20: Site Z indicative scheme plan

7.6 Assessment of Short List Options

As outlined in the methodology section (Section 4), a scored multi-criteria assessment was used to assess the short listed sites. In preparation for the MCA workshop, the Project Team were asked to undertake a site visit of the short listed sites (where possible) and provide a specialist summary report. Sites X and W were not granted access, whilst specialists were able to walk-over the remaining shortlisted sites.

The specialists were then asked to pre-score each site (in their specialist area) using prior knowledge (through the long list) and any findings attained through the site visits.

At the MCA workshop, the specialist's scores for each site were examined site by site. For each option, the expert responsible for each criterion presented to the group, explaining the basis of their assessment, general themes and comments, and the overall scoring they attributed to each site. In some cases, following the discussion of the relevant criterion, some scores were amended from what was pre-scored

Table 11 below provides a summary of the short list assessment. Table 5 includes the Assessment Criteria for the shortlisted options. Refer to Appendices E and F and G for more details on this assessment. Appendix H also provides a geotechnical assessment for sites that were able to be accessed during the time available.

Table 11: Summary of short list option assessment

Short list assessment		B	C	S	T	W	X	Z
Heritage	2a. Heritage							
	2b. Archaeology							
Social and community	3a. Land requirement							
	3b. Social impact							
	3c. Odour amenity							
	3d. Operational effects							
Natural environment	4a. Landscape / visual							
	4b. Ecology							
	4c. Flooding risk							
	4d. Risk of coastal inundation							
	4e. Highly Productive Land							
Constructability	5a. Wastewater conveyance							
	5b. Construction risk							
	5c. WWTP construction footprint and other engineering considerations							
Operability	6a. Operation and maintenance							
	6b. Hydraulic considerations							
	6c. Short-term serviceability							
Carbon	7a. Capital greenhouse gas emissions							
	7b. Operational greenhouse gas emissions							

Short list assessment		B	C	S	T	W	X	Z
Reuse	8a. Wastewater Reuse							
1	2	3	4	5	6	7	8	9

Figure 21: MCA Scoring Table

The Project Team reviewed and compared options B, C, S, T, W, X and Z against the short list criteria. The following table summarises the assessment of the short list options against the six criteria topics – heritage, social and community, natural environment, constructability, operability, carbon and reuse:

Table 12: Short list assessment summary

Topic	Assessment
Heritage	<p>a. From a heritage perspective there were no key differentiators between the sites, all receiving a score of 7. None of the sites included sites and places of known value, heritage buildings, notable trees or sites and places of European cultural heritage value on site.</p> <p>b. From an archaeology perspective, there were no key differentiators between the sites, and all received a score of 7.</p>
Social and community	<p>a. From a land requirement perspective, site Z scored the highest as Watercare already owns this site. Sites that were more complex to acquire scored lower.</p> <p>b. From a social impact perspective, sites with no direct impact on social, community or recreational facilities scored higher, while sites with moderate impacts on social community or recreational facilities scored lower.</p> <p>c. From an odour perspective sites able to achieve a buffer distance of 200 m from the WWTP to the site boundary and 300 m from the WWTP to nearby residents scored highest. Sites that achieved a 200 m buffer distance between the WWTP and the site boundary but not a 300 m buffer distance to nearby residents scored moderately. Sites where neither buffer distances could be achieved scored the lowest.</p> <p>d. From an operational effects perspective, sites with a sufficient distance from residential areas, with minimal odour impacts, and with good access scored higher. Sites in proximity to residential properties and with properties situated to the west (given the prevailing winds are southwesterlies) scored lower.</p>
Natural environment	<p>a. From a landscape and visual perspective, sites with sufficient separation distances from residential properties and with minimal overlooking impacts scored higher, while elevated sites and sites in proximity to residential properties scored lower.</p> <p>b. From an ecology perspective, sites with minimal ecological value (significant flora, indigenous biodiversity, or streams, waterways, or wetlands) scored the highest and sites with areas of ecological value, particularly natural wetlands, scored lower.</p>

Topic	Assessment
	<p>c. From a flooding risk perspective, sites with some flooding risk across the wider site (not within the proposed WWTP area) scored higher, while sites with flooding within the future WWTP area scored lower.</p> <p>d. From a coastal inundation perspective, sites subject to very little coastal inundation scored the highest. Sites with minor coastal inundation scored moderately well, while sites with significant coastal inundation scored the lowest.</p> <p>e. From a productive land perspective, there were no key differentiators between the sites B, C, S, T, X and W, which all received a score of 5. However, as site Z is the existing WWTP site, it would not result in the loss of highly productive land and has been scored 9.</p>
Constructability	<p>a. From a wastewater conveyance perspective, sites that required reduced piping lengths and were in proximity to the Boyd Road conveyance point site scored the highest. Sites further from the Boyd Road conveyance site that required longer piping lengths and more complex pumping stations scored lower.</p> <p>b. From a construction risk perspective, sites with less construction complexity and risk (e.g. suitability of ground conditions, ability to meet requirements of programme and staging, potential effects associated with dust, noise and vibration) scored higher. Sites with high construction complexity and risk scored lower.</p> <p>c. Considering the WWTP construction footprint and other engineering considerations, sites with better access, less earthworks required, and less complex utilities and geotechnical considerations generally ranked higher. Conversely, sites with poorer access, more earthworks, and complex utilities and geotechnical considerations scored lower.</p>
Operability	<p>a. From an operation and maintenance – WWTP perspective, sites of a sufficient size, that were relatively flat and generally provided ease of operation and maintenance scored higher. Smaller sites that required more complex WWTP operation and maintenance scored lower.</p> <p>b. From a hydraulic considerations perspective, sites that required shorter pipe lengths, and did not cross the Taihiki River twice scored higher. Sites that required longer pipe lengths and crossed the Taihiki River twice scored lower.</p> <p>c. From a short-term serviceability perspective, sites that required smaller pipes and that could service planned development in the short term scored higher. Sites where the Waiuku pipeline would not reach the Kahawai Point or Kingseat connection to service these developments scored lower.</p>
Carbon	<p>a. From a capital greenhouse gas emissions perspective, sites with lesser pipe lengths and lower embedded carbon scored higher. Site with higher emissions generated from the construction of the WWTP scored lower.</p>

Topic	Assessment
	b. From an operational greenhouse gas perspective, electricity usage and associated operational emissions were the main differentiating factor. Given this, sites with longer pipeline and higher pumping requirements scored lower.
Reuse	a. From a wastewater reuse perspective, sites in proximity to Awhitu with land for crops scored the highest. While sites slightly further from Awhitu ranked lower. Sites closer to potential managed aquifer recharge sites and potential industrial reuse options also scored higher.

7.7 Indicative Costs

Comparative indicative capital costs for the entire wastewater scheme (including design and investigation, pipelines, pump stations, the WWTP and tidal storage) are shown in Figure 18. This shows that sites S and Z are the most expensive, site C is the least expensive, and the remaining sites have similar capital cost estimates.

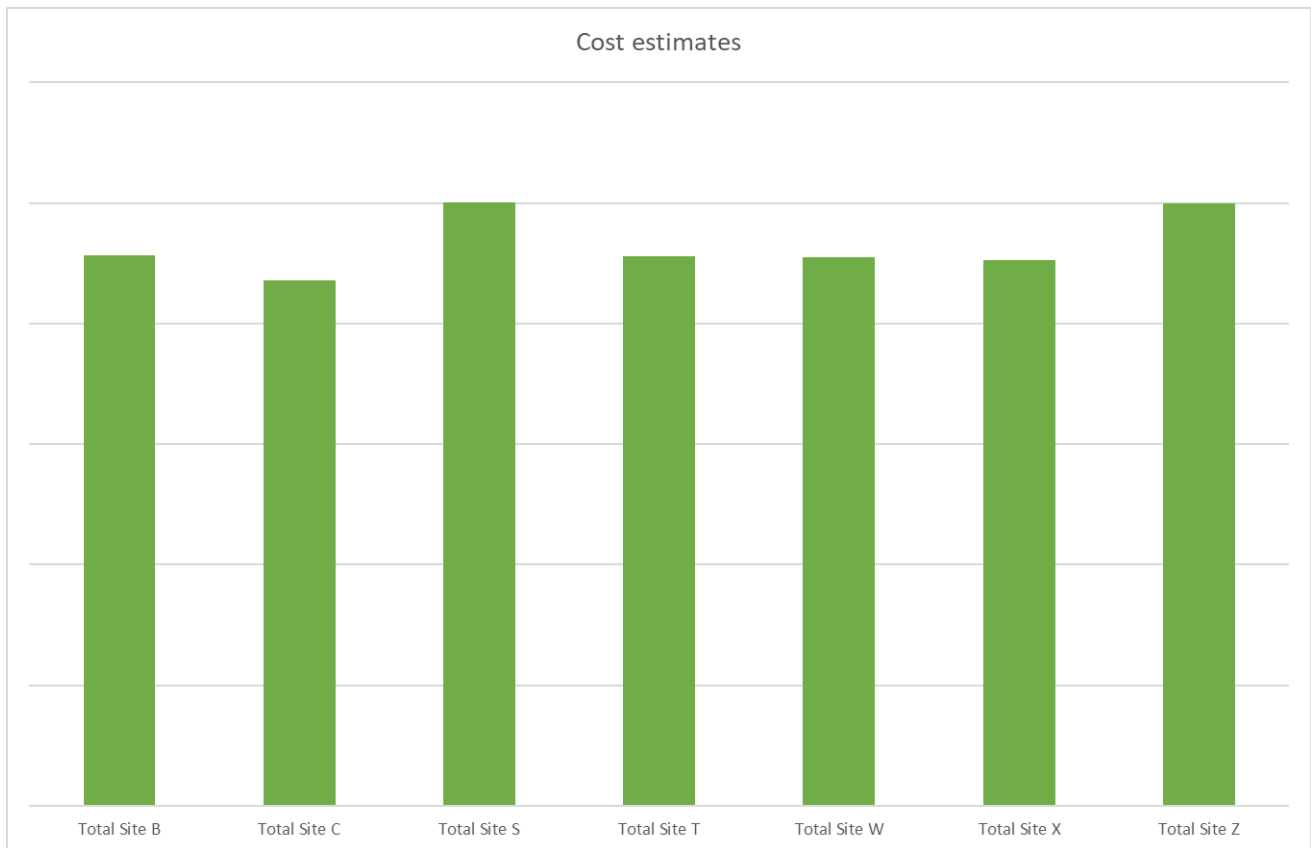


Figure 22: Comparative Indicative Capital Costs

7.8 Identification of Emerging Preferred Option

The Project Team reviewed and compared the assessment of options identified above, taking into account the outcomes of the MCA, additional cost and carbon considerations and any feedback received through engagement with mana whenua and the community.

From this review, Options B and Z were identified as the emerging preferred options.

In summary, Site B was preferred from an engineering perspective due to the ease of conveyance and constructability. The site was considered favourable as it is closest to the outfall resulting in shorter pipelines and does not require as many pipe crossings of the Taihiki River. Options that did not require as many pipe crossings of the Taihiki River were considered more favourable from mana whenua.

As it is a larger site (when compared to other options), from an amenity perspective, Site B was considered to provide a sufficient odour buffer (both the 200m buffer within the site and the 300m buffer to sensitive receptors outside the site) and has adequate construction space. From a carbon perspective, Site B had the lowest capital carbon emissions (26.62 M kg/CO₂) when compared to the other options. Notwithstanding the above, some concerns were raised by the Project Team in relation to land acquisition which warranted further consideration at the next stage of assessment. Overall, site B aligned most closely with the MCA criteria.

With regard to Site Z, it was noted that given it is an existing WWTP site there is greater certainty around timing and operation as it is an existing designated site. Site Z was also considered favourable as it is close to y the Waiuku Kaawa aquifer, and some existing and future growth areas. However, given that Site Z requires the longest pipe length it scored lowest in regard to wastewater conveyance, construction risk, hydraulic considerations, and capital greenhouse gas emissions (35.37 M kg/CO₂). Site Z was identified as a low risk option due to the fact it is an existing designated site and was taken forward as an emerging preferred option on that basis.

The remaining options were not progressed by the Project Team at this time for the reasons outlined in Table 13 below:

Table 13: Summary of options that were not progressed

Options not being progressed at this time	Assessment
C	<p>Like Site B, the site is very large with sufficient odour buffer and good screening from sensitive receivers. There are, however, some notable sensitive receivers in proximity to the site, including the Karaka Point Vineyards (although the vineyard had recently been sold) and other residential properties. Additionally, site C is an existing farm which is valuable to the community.</p> <p>Moreover, water channels flow through the site and limits the location of the WWTP within the site, especially given the WWTP should be located away from the culturally-sensitive headlands.</p> <p>Site C is the second closest to the outfall and does not require two crossings of the Taihiki River. The shorter pipeline lengths resulted in higher scores for wastewater conveyance, construction risk, hydraulic considerations, and capital greenhouse gas emissions (27.15 M kg/CO₂).</p> <p>Site C was not progressed as the specialists considered it scored lower than site B. It had similar pros and cons but overall scored slightly lower.</p>
S	<p>Site S was primarily not progressed due to conveyance, hydraulic and short-term serviceability issues.</p> <p>Site S is the largest shortlisted site and subsequently scores high for odour and social impact effects.</p> <p>However, as Site S is located far from the Clarks Beach outfall, and would require long pipeline lengths that cross the Taihiki River. Due to the long pipe lengths, site S scored low for wastewater conveyance, hydraulic considerations, and capital greenhouse gas emissions (32.65 M kg/CO₂).</p>

Options not being progressed at this time	Assessment
	<p>Site S scores the second-lowest for WWTP construction footprint and scores the equal lowest for short-term serviceability due to the inability to service Kahawai Point.</p>
<p>T</p>	<p>Site T was not as preferred as site B, yet still had some merits.</p> <p>Site T is one of the larger shortlisted options and subsequently scored high for odour and social impact effects.</p> <p>However, as Site T is located far from the Clarks Beach outfall and would require long pipeline lengths that cross the Taihiki River. Due to the long pipe lengths, site T scored low for wastewater conveyance, hydraulic considerations and capital greenhouse gas emissions (29.41 M kg/CO₂).</p> <p>T also scored low for short-term serviceability due to the inability to service Kahawai Point.</p>
<p>W</p>	<p>Site W was not progressed due to significant operational effects and poor constructability. Site W scored low for construction risk due to the required extra crossing of the Tahiki River and smaller site size.</p> <p>In addition, Site W is the third-smallest site of any options and scores the second lowest in terms of odour effects. From a landscape and visual perspective, Site W is in proximity to the Kahawai Point development. Ngāti Te Ata requested that site W was not progressed due to its proximity to the development and potential reverse sensitivity effects.</p> <p>Site W scored the lowest for flood risk as the proposed WWTP area includes flood-prone land and access to the plant requires access over an overland flow path.</p>
<p>X</p>	<p>Site X was also not be progressed due to significant operational effects and poor constructability. Site X scored low for construction risk due to the extra Tahiki River crossing required and the smaller site size.</p> <p>In addition, Site X is one of the smaller sites and scored the lowest in terms of odour effects.</p> <p>From a landscape and visual perspective, Site X is neighbouring to the Kahawai Point development. Ngāti Te Ata requested that site X was not progressed due to its proximity to the development and potential reverse sensitivity effects.</p> <p>In addition, site X scores low for wastewater conveyance due to longer pipeline lengths, WWTP construction footprint and ecology.</p>

7.9 Mana Whenua Engagement

Following the assessment of the short list options, engagement was undertaken with mana whenua to present on the outcomes of the short list assessment and discuss next steps. More information regarding mana whenua engagement can be found in Appendix C.

7.9.1 Mana Whenua Engagement

Ngāti Te Ata

Following the MCA workshop, Ngāti Te Ata reiterated that all shortlisted sites are of cultural significance. This area is considered a traditional place of gathering kaimoana. In addition, the sites are of historic importance as they were used for defence during battle.

Ngāti Tamaoho

Key issues raised by Ngāti Tamaoho throughout the short list assessment process include:

- Ngāti Tamaoho did not support multiple pipes under the Taihiki River.
- Ngāti Tamaoho supports the exploration of ecological enhancement.
- Ngāti Tamaoho supports the exploration of re-use options for each site.
- Ngāti Tamaoho reiterated that they would like to provide a CVA for all shortlisted sites.

Ngāti Tamaoho confirmed via email that they preferred Site C due to its size for futureproofing. In addition, if site C were selected, the WWTP could be built furthest away from the coastline.

7.10 Community Engagement

On 14 December 2021, a Community Open Day was held to discuss the seven shortlisted sites. The submissions for feedback were open until the end of January 2022 and 22 submissions were received from the community. The submission received on the short list options is summarised below:

Table 14: Community Engagement Feedback on Shortlisted Sites

Option	Number of Votes	Reasons for supporting
Site Z	11	Site Z was seen as a practical site by the community. There was a theme amongst the feedback for all sites of keeping the WWTP away from new developments and built-up areas. Feedback mentioned Watercare already owning site Z as a positive. Some also mentioned consenting would be easier on the existing site. The opportunities for water reuse with local industry was also seen as a positive.
Site B	6	Site B was supported by residents living nearby who preferred a WWTP to a housing development next door. There was a preference to have a large buffer and any land not used for the WWTP be allocated for community use
Site C	2	Site C was supported at the open day noting that both Site B and C made the most sense in relation to their proximity to the outfall.
Site S	1	Site S was perceived to cause the least disruption to residents.
Site T	1	Site T was supported by a local landowner if it is needed to supplement Z.

Neither sites **W** or **X** were indicated as preferred sites in the 22 submissions.

7.11 Preferred Option

Following further consideration of the relative advantages and disadvantages of the two emerging preferred sites, and engagement with mana whenua and the community, Watercare selected site B as the preferred option. Overall, site B was selected as it:

- Had the lowest capital carbon emissions of all sites considered;
- Whilst waterways run through the site, the future WWTP could be constructed outside of direct floodplains;
- The large site provides opportunities for the WWTP infrastructure to be located away from culturally sensitive headland features;
- Minimised the operational complexity associated with the proposed conveyance network, reduced septicity risk in the wastewater network and associated health and safety risks;

- Is of a sufficient size so the WWTP can be located away from culturally-sensitive headlands.
- Did not have any known adverse effects on heritage values;
- Required the acquisition of a single large site;
- Was large enough to accommodate the preferred odour buffer to sensitive sites (300m) and also maintain the 200m internal buffer distance to the site boundary;
- Being a large site, minimised adverse operational effects on neighbouring properties;
- Whilst containing some ecological features, direct adverse effects could likely be avoided and the size of the site afforded ecological restoration opportunities;
- Future plan changes can be accommodated more easily

7.12 Assessment against Project Objectives

As per section 1.2 of this report, the objectives for the project are as follows:

To provide for the treatment of wastewater in southwest Auckland in a manner that:

- Responds to planned growth*
- Protects public health*
- Provides for flexible implementation including potential wastewater reuse in the future*
- Keeps the overall costs of service to customers at sustainable levels*
- Helps Watercare achieve its targets for reducing carbon emissions*
- Has regard to mana whenua's cultural and spiritual values.*

As a final assessment, preferred site B was assessed against the designation objectives in the Table 15 below.

Table 15: Site B Assessment against Project Objectives

Objective	Assessment
<i>To provide for the treatment of wastewater in southwest Auckland in a manner that:</i>	
<i>a. Responds to planned growth</i>	Site B is a large site and provides for the long-term planned growth of wastewater treatment infrastructure to provide for a long-term population of 60,000 PE. It is also closer to the northern growth areas which enables efficient connection of future growth.
<i>b. Protects public health</i>	Site B, being a large site, ensures the preferred buffer distance to sensitive receivers (300m) can be achieved thereby avoiding adverse health and amenity effects should unexpected adverse odours occur.
<i>c. Provides for flexible implementation including potential wastewater reuse in the future</i>	Site B provides enough land to enable the future establishment of an AWT plant to enable reuse. End uses for possible future reuse options include irrigation of cropping land, irrigation on Awhitu Peninsula and direct potable reuse.

Objective	Assessment
d. <i>Keeps the overall costs of service to customers at sustainable levels</i>	Site B, whilst not the lowest cost of the short listed sites considered, has less capital cost than site Z which was the original option considered at the Waiuku WWTP site.
e. <i>Helps Watercare achieve its targets for reducing carbon emissions</i>	From a capital carbon perspective, site B had the lowest carbon emissions (26.62 M kg/CO ₂) when compared to the other short-listed options. This is largely related to the shorter pipeline lengths associated with the site.
f. <i>Has regard to mana whenua's cultural and spiritual values.</i>	Acknowledging that all sites have cultural value associated with them, site B is a large site and enables the wastewater treatment infrastructure to be located away from sensitive headlands. Unlike some other short-listed sites located south of the Taihiki River, it avoids the need for two pipelines crossing the Taihiki River. These matters were key considerations identified by mana whenua during the option assessment process.

8 Conclusion

This assessment of alternative sites has been prepared on behalf of Watercare to support the NoR for designation and has been prepared in accordance with Section 171(1)(b) of the RMA.

This assessment has evaluated a wide range of sites for the Southwest WWTP location using a robust assessment methodology, as outlined in Section 4.

Throughout the short and long list assessments, mana whenua groups and the community were consulted with and provided feedback on the various sites. An overview of mana whenua engagement is provided in Section 5. The community engagement undertaken is described in Section 6.

Section 7 outlines the consideration of alternatives and demonstrates the longlist and shortlist assessment and the emerging preferred sites. Following a further review of the relative advantages and disadvantages of the two emerging preferred sites and engagement with mana whenua and the community, site B was selected as the preferred option.

Due to its large size, site B can accommodate the preferred odour buffer to sensitive sites (300m) and allows the WWTP infrastructure to be located away from culturally sensitive headland features. It has less pipelines across the Taihiki River (a preference expressed by mana whenua). In addition, when compared with the other sites, the operational complexity is minimised, there are few physical constraints, and it has the lowest capital carbon emissions of all options considered.

A

Appendix A – Long List Site Summaries

B

Appendix B – Long List Assessment

C

Appendix C – Mana Whenua and Community Engagement

D

Appendix D – Additional Long List Assessment

E

Appendix E – Indicative Layouts for Short List Sites

F

Appendix F – Technical Assessment Summaries

G

Appendix G – Short List Assessment

H

Appendix H – Geotechnical Assessment

Watercare Services Limited
Private Bag 92521
Victoria St West
Auckland 1142

27 March 2023

Attention: Anshita Jerath

Dear Anshita

Southwest Wastewater Treatment Plant - Assessment of Alternative Sites - Addendum

1 Introduction

In your email dated 16 February 2023, you have advised:

“Thank you for preparing the Southwest WWTP Options Assessment Report, dated 7 December 2022.

The report concluded that Site B is the preferred site for a new WWTP. The project team concurred with the Options Assessment report and progressed with the land acquisition for 162 Clarks Beach Road (Site B). We undertook on site assessments and issued a s18 PWA notice to the landowner for land acquisition of the full site. The commercial negotiations for the site (162 Clarks Beach Road) have not been resolved and there are complexities in acquiring this site. If we continue with the Public Works Act process there will be a significant risk to not be able to complete the scheme by our June 2026 date.

Accordingly we have decided to relook at our options and investigate our other shortlisted sites for a new WWTP. Are you please able to relook at the other Shortlisted sites and assess them against the Criteria and objectives to confirm whether another site is suitable for the new WWTP. In particular taking into account Watercare’s need to have this scheme built by June 2026.”

The purpose of this letter is to respond to your request made above. This letter should be read as an addendum to the reported titled “Southwest Wastewater Treatment Plant – Assessment of Alternative Sites, Prepared for Watercare Services Limited by Beca Limited, 7 December 2022’ (henceforth referred to as the ‘Report’).

2 Further Consideration of Short-Listed Sites

The Report considered seven short-listed sites, these were sites B, C, X, W, T, S and Z. Your advice that commercial negotiations for site B have not been resolved and there were complexities in acquiring this site under the Public Works Act, has highlighted that ease of acquisition is an essential consideration for any site chosen for the WWTP, given the need for the Southwest sub-regional wastewater scheme to be commissioned by June 2026. To achieve this timeframe, the land acquisition process for the selected site would need to be achieved in a timely fashion with a willing landowner.

As a first consideration, we have reviewed and where appropriate updated the assessment against the 'Land requirement' criteria from the Report which considered the status of impacted property and the discussions that had been held with landowners at the time the Report was prepared. This is summarised in Table 1 below with an assessment of whether the site should be considered further.

Table 1: Consideration of Short-Listed Sites for Further Consideration

Site	MCA Score for Land Requirement Criteria	Commentary	Suitability for Further Consideration
B	5	This site has been purchased by a developer who intends to undertake residential development of the land. He was initially willing to accommodate Watercare on site. However, negotiations to purchase the site have been drawn out and you advise they are unlikely to result in agreement. Specialists were allowed access to the site as part of preparing the Report; however, once negotiations were underway the landowner formally objected to further specialists entering the site with Watercare.	No
C	7	No constraints were identified previously, however it was indicated that 'most likely will need to acquire rear portion of land with easement to access'. Specialists were allowed access to the site as part of preparing the Report.	Yes
S	7	No constraints were identified. Specialists were allowed access to the site as part of preparing the Report.	Yes
T	8	No constraints were identified. It was previously noted that 'owner discussed option of selling desired 3 to 4 ha area to Watercare and continuing to market garden the buffer land that Watercare would place a covenant on, thus reducing the purchase price'. Specialists were allowed access to the site as part of preparing the Report.	Yes

Site	MCA Score for Land Requirement Criteria	Commentary	Suitability for Further Consideration
W	4	The owner had a strong resistance to sell, and specialists were not allowed access as part of preparing the Report.	No
X	4	The owner had a strong resistance to sell, and specialists were not allowed access as part of preparing the Report.	No
Z	9	Land already owned by Watercare and designated as a WWTP site.	Yes

Given the above commentary, sites C, S, T and Z have been taken forward for further consideration as part of this Addendum. Site B has not been taken forward given the complexities associated with acquisition and unlikelihood that agreement can be reached with the owner. Sites W and X have not been considered further given that in each case the owner had a strong resistance to sell.

3 Updates to Short List Report

As part of preparing this Addendum, the supporting information to the Report was reviewed to determine whether it needed to be updated.

Appendix E to the Report (Indicative Layouts for Short List Sites) was reviewed and the aerial photos were updated as those previously used were out of date. As part of this process additional residential properties were more clearly identified which resulted in new odour buffers to the northern end of site C.

The updated version of the Indicative Layouts for the Short Listed Sites is attached as Appendix A to this Addendum.

As a result of this change the MCA criteria for odour amenity (criteria number 3c) for site C was reduced from a score of six to a five. No other changes were made to the MCA scoring.

A revised summary of the short list options for sites C, S, T and Z is presented in Table 2 below.

Table 2: Summary of Short List Option Assessment – Updated for Addendum

Short list assessment		C	S	T	Z
Heritage	2a. Heritage				
	2b. Archaeology				
Social and community	3a. Land requirement				
	3b. Social impact				
	3c. Odour amenity				
	3d. Operational effects				
Natural environment	4a. Landscape / visual				
	4b. Ecology				
	4c. Flooding risk				
	4d. Risk of coastal inundation				
	4e. Highly Productive Land				
Constructability	5a. Wastewater conveyance				
	5b. Construction risk				
	5c. WWTP construction footprint and other engineering considerations				
Operability	6a. Operation and maintenance				
	6b. Hydraulic considerations				
	6c. Short-term serviceability				
Carbon	7a. Capital greenhouse gas emissions				
	7b. Operational greenhouse gas emissions				
Reuse	8a. Wastewater Reuse				

An overall commentary of the relative scoring of the options, incorporating feedback from mana whenua obtained previously, is incorporated into the Table 3 below.

Table 3: Overall Scoring Commentary

Site	Overall Scoring Commentary
C	<p>This site scores well against a number of considerations including low risk of coastal inundation, construction risk, WWTP construction footprint and other engineering considerations, operation and maintenance, hydraulic considerations and capital greenhouse emissions.</p> <p>However, the site does not score as well from an odour perspective. The amount of sensitive receivers to the north of the site, along with a stream running through the site, means that the WWTP would be unlikely to be accommodated at the northern end, and the WWTP would need to be located at the southern end of the site. This would potentially have adverse landscape and visual impacts and would go against the wishes expressed by mana whenua of having the WWTP located away from coastal headlands.</p>
S	<p>Sites S scores well against a number of considerations including odour amenity, ecology, operation and maintenance and reuse.</p> <p>Due to the requirement for the WWTP to be located at the eastern end of the site, and Site S being located to the south of the Tahiki River, there are long pipe lengths associated with this location. Accordingly, this site did not score well from the perspective of wastewater conveyance, short-term serviceability and capital greenhouse gas emissions.</p> <p>The WWTP on this site would also be located on a coastal headland with potential adverse landscape and visual effects and effects on mana whenua values.</p>
T	<p>Site T scores well against a number of considerations including land requirements, odour amenity, ecology, WWTP construction footprint and other engineering considerations, operation and maintenance and reuse.</p> <p>Similar to site S, the site did not score as well against wastewater conveyance (being located to the south of the Tahiki River), and short-term serviceability. The site had moderate capital greenhouse gas emissions (less than sites Z and S, but greater than site C).</p> <p>The site is not located on a coastal headland.</p>
Z	<p>Site Z scores well against a number of considerations, particularly land requirement (Watercare own the site) and reuse. It does not score well on the criteria of wastewater conveyance, construction risk, hydraulic considerations, and capital and operational greenhouse gas emissions.</p> <p>The site is located on a coastal headland.</p>

Given the construction timeframe of 2026 required by this Project, it is considered the most important criteria is land requirement (being able to acquire the land within the time required), whilst balancing the other multi-faceted criteria. Site T and Z score highest on this criteria alone.

Odour amenity is an important consideration alongside other potential adverse amenity effects on neighbours. The constrained site C from an odour perspective pushes the WWTP to the south of the site, but this has potential adverse effects on cultural values. Sites S and T score well in relation to odour due to the low number of potential receptors, whilst Site Z is an established WWTP site and scores well against this consideration.

Carbon considerations are an important matter for Watercare to achieve its carbon reduction targets, and site C scores the highest, largely due to being located to the north of the Taihiki River, with shorter pipe lengths. Site T scores better than site S due to shorter pipe lengths. Site Z has the highest capital and operational greenhouse gas emissions and scores the lowest of all sites.

Overall, when balancing the above factors, it is considered site T is the preferred site as it:

1. Scores well from a land requirement perspective (potentially willing seller);
2. Scores well from an odour amenity perspective;
3. Scores well in terms of construction footprint and other engineering considerations;
4. Scores well from an ecology perspective, noting additional ecology surveys are required to identify any site specific constraints;
5. Whilst scoring lower than site C from a carbon perspective, scores better than sites S and Z;
6. Is located away from a coastal headland, with the potential for reduced effects on mana whenua values.

As a next step it is recommended that Watercare determine that Site T is now its preferred site for the WWTP, and then engage with the landowner of site T, mana whenua and other stakeholders regarding the potential acquisition and designation of the site. Should these discussions be drawn out or prove to be problematic, thereby calling into question the ability to commission the Southwest sub-regional wastewater scheme by June 2026, it is recommended that site Z (the existing Waiuku WWTP site) be given further consideration as it remains a feasible back-up option to site T, and if selected would allow for the scheme to be commissioned by June 2026.

Yours sincerely



Garrett Hall

Technical Director - Environments

on behalf of

Beca Limited

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