

Report to the Board of Watercare Services Limited

Subject: Site Selection for Replacement of Huia Water Treatment Plant

Date 30 May 2017

Capex C-12205

1 PROPOSAL

It is proposed to replace the Huia Water Treatment Plant (**WTP**) with a new facility on the Manuka Road site which is owned by Watercare and designated for this purpose. The reservoirs will be constructed on a site (Woodlands Park Road) also designated for this purpose, opposite the existing WTP.

This report sets out the process that has been used to determine the preferred option and the reasons why this option has been selected.



Figure 1. Artist impression looking east along Woodlands Park Road towards Titirangi Township, based on indicative plant design/layout

2 BUSINESS NEED

Consideration of the future water supply needs of the Auckland Region over a 50 to 100 year horizon was carried out by Watercare in 2009. The purpose of this study was; “... to identify the most appropriate mix of bulk water supply augmentation options required to meet future (50 to 100 year) demands and security of supply”.

The top ranking options included; “Expanding Huia WTP to 140 MLD” and “Expanding the Waikato scheme”. The Options Report recommended that; “A comprehensive master plan should be compiled for the future development of the Huia WTP”.

A Master Plan was prepared in 2010. This plan; *“...focuses on the western sources and particularly the Huia WTP and its future role in meeting the ongoing needs of a growing region”*. The Master Plan assessed the current and future role of the Huia WTP and concluded, amongst other things, the following:

- Watercare has a very substantial investment in Auckland’s water supply infrastructure;
- The Huia WTP supplies and will continue to supply around 20% of the region’s integrated water supply system;
- The future plant will be designed to cater for seismic events in the region. This will improve the security of supply for the overall network;
- An increase in peak capacity of the Huia WTP provides additional headroom such that flow can be increased to make up the shortfall in the event of the failure or planned shutdown of one of the other system assets (WTPs or distribution network). This capability increases the overall system flexibility and hence system security and resilience. This is important in reducing the risk to the southern sources. The plant and reservoirs will also have a storage management benefit¹;
- The plant has an important role in providing peak water needs to the Auckland region. There is a much higher need for this asset to reliably perform during peak demand periods and this needs to be reflected in terms of future infrastructure redundancy and reliability²; and
- Since Huia WTP has the capability to supply some water to Auckland from the upper dams with minimal power requirements it also plays an important role in supplying water to the region in emergency situation when there is major power supply disruptions.

The Master Plan evaluated the process capacity of the existing plant and found that several process elements prevented the maximum production capacity of 126 MLD being achieved due to the water quality and the necessity for powdered activated carbon (**PAC**) dosing. The plant’s production was limited to 65 MLD. It also identified a series of key water quality risks that the existing plant was not ideally suited to managing.

The Huia plant was originally constructed in 1928, making components of the plant 89 years old. An asset condition review conducted as part of the Master Plan; *“...highlighted the fact that many of the existing Huia water treatment assets are at the end of their economic life”*.

It concluded that; *“given that substantial capital needs to be spent on more advanced process configurations, addressing seismic requirements, and addressing hydraulic limitations, the project team does not consider that it is viable for Watercare to invest this capital into an asset base that is nearing the end of its serviceable/economic life”*.

Subsequent work conducted by Watercare identified that sites other than the site of the WTP could be advantageous. For example, in the 2013 Huia WTP Upgrade Implementation Strategy, the authors noted that *“in developing alternative site layout options for the new Huia WTP it was identified that the Manuka Road site would also be ideal for the new treatment plant”*.

¹ These conclusions were proved correct during the recent Tasman Tempest when the Huia WTP was operated at maximum capacity due to the limitations on Ardmore WTP as a result of the storm.

² As above.

In summary, previous studies have concluded that a new replacement Huia WTP is required because:

- The Waitakere Ranges water sources and the Huia WTP are important elements of the Auckland region's water supply system and contribute to its resilience, especially as Auckland continues to grow. This was demonstrated following the "Tasman Tempest" event when the plant was required to run at maximum capacity in order to compensate for the loss of production at the Ardmore WTP;
- The existing ageing Huia WTP asset base represents a high risk when looking at a 20 to 50 year master planning horizon, and therefore new assets are required to meet Watercare's service standards;
- The existing WTP is not suited to enable management of a series of key water quality risks and the process capacity of several components does not currently achieve the plant's maximum production capacity of 126 MLD. Watercare has made temporary upgrades to the plant to meet the water quality issues identified. The sustainable capacity is now 110 MLD.

3 PROJECT PROCESS

3.1 Original Work

Watercare has been planning to replace the aging infrastructure at Huia WTP since 2008. Previous work on the siting of the replacement Huia WTP focused on utilising the land owned by Watercare and appropriately designated on Manuka Road (immediately to the east of the existing WTP) site, with reservoirs to be constructed on Woodlands Park Road.

Extensive investigations were undertaken and approximately 50 layouts were developed for the Manuka Road, with the reservoirs on Woodlands Park Road. The preferred design was to be carried forward, finalised and consents sought for the construction and operation of the plant on this site.

The focus on these sites was due to them being designated for "water supply purposes Huia and Nihotupu water treatment plants and associated structures" under both the provisions of the Waitakere District Plan and the Proposed Auckland Unitary Plan (**PAUP**). Under the Waitakere Plan, the plant and associated reservoirs could be established on the sites by way of an Outline Plan of Works (**OPW**), as the designation negated the rules of the Plan that protected the native vegetation on the sites and the need to gain consent to carry out earthworks on the sites.

The effect of the designation, was superseded by the Significant Ecological Area (**SEA**) overlay that was imposed on the sites under the PAUP. This overlay established a new regional resource consent requirement for vegetation removal and negated the ability to remove the trees on the site under the provisions of the designation. As the removal of the trees would require a resource consent, Watercare was required, under the provisions of the Resource Management Act 1991 (**RMA**) to consider alternatives to the Manuka Road site.

The following figure shows the designated sites. The northern site is referred to as Woodlands Park Road, the eastern block is Manuka Road and the south western lot is the existing Huia WTP. The land to the south east is Auckland Council reserve land and is known as Clarks Bush.



Figure 2: Designation – Showing all three sites

3.2 Second Phase

To satisfy the RMA requirements to consider alternatives, Watercare has undertaken a first principles approach to investigate and provide adequate consideration to siting options. The Huia WTP Site Selection Study commenced in late 2015.

The site selection study has since progressed through the following stages:

Selection Preparation

Watercare commenced by developing site principles which govern the site selection process. The site principles were;

- Location – to ensure that plant is located on a site that is suitable for construction and long term operation;
- Proximity – to optimise use of the raw water and treated water networks;
- Size – to ensure that the site has sufficient land area; and
- Elevation – to minimise pumping costs by gravity feed.

The site principles were socialised with a stakeholder group that was established by Watercare and made up of community representatives. No alternative sites had been identified at this point.

Site Identification

GIS screening was used to identify sites that met at least one of the principles. This stage initially identified over a hundred sites. These were reduced down using the underlying principles and fatal flaw analysis to 40 sites, then down to 21 then 19 discrete sites.

Long listing

Indicative site layouts, indicative plan and long sections for pipelines and high level capital cost estimates were developed for each of the 19 sites. This information was utilised to undertake a high level Multi Criteria Analysis (**MCA**) scoring and initial ranking of all the preliminary long listed sites. These sites were then grouped into eight schemes that had similar hydraulic characteristics and pipeline routes.

The eight schemes were then assessed by the project team that consisted of subject matter experts (private consultants) and Watercare staff, all highly qualified and experienced in their fields. At the assessment workshops, experts considered the options in terms of their own expertise. Their findings on each of the options were discussed in a forum that is designed to eliminate the potential for biases and undue influences to dictate the outcome of the analysis.

The criteria taken into account included: landscape and visual impacts, ecological effects, implications in terms of archaeology and heritage, social impacts, traffic, noise, engineering feasibility and constructability, operability and property.

The workshop process confirmed the criteria and shared knowledge and information about each of the criterion and how each of the options would relate to each criterion. The scoring system ranged from 1 (where the option had particular problems in terms of that criterion) and 5 (where the option performed well under the criterion). Working together, workshop attendees scored the WTP options under all criteria. The scores ranged across the whole numeric range (1 to 5), depending on the criterion. It was considered whether any of the options contained fatal flaws in terms of any of the criteria, and it was decided that there were no fatal flaws.

In the long listing process, the scoring of social and community effects focused on noise and amenity effects associated with the construction and operation of a WTP and were based on a desk top assessment. No detailed Social Impact Assessment (**SIA**) was undertaken at this stage, given the number of sites under consideration. Undertaking any analysis at this stage risked generating significant interest and potential concern across such a large number of communities, Watercare considered it preferable to undertake a detailed SIA at the shortlisting stage. This is considered standard practice.

Heritage and archaeological effects were also scored based on a desk-top assessment in this phase. This was considered appropriate considering the amount of information readily available through the PAUP process and archview database as well as previous reporting undertaken in relation to the existing Huia WTP site. Also this criterion was considered unlikely to be a key differentiator / component, notwithstanding the values of the existing Huia WTP which have already been well-documented.

This work was encapsulated in the Tonkin and Taylor report, "Huia WTP Replacement Report on the Long list Options", June 2016 (which is publicly available as are all the reports referred to in this report).

The eight schemes were reduced through the above process to four shortlisted sites.

Short listing and Preferred site selection

Site design development was undertaken for the four short listed sites and documented in "Shortlist Site Development Report" (GHD, 2016) for the purpose of site evaluation.

The four short list options that were brought forward and assessed are:

- A new WTP at 130 Parker Road and adjoining properties, (**Parker Road North Option**);
- A new WTP at 152 Parker Road (**Parker Road South Option**);
- A new WTP on Watercare land adjacent to the existing Huia WTP on Manuka Road with two reservoirs located on Woodlands Park Road (**Manuka Road Option**); and
- The replacement of the Huia WTP on the existing site at Manuka Road with two reservoirs on Woodlands Park Road (**Existing WTP Option**). This assumes that the existing plant will be demolished.

A location map of these sites is provided in **Attachment 1**.

Additional subject matter experts were engaged in December 2016 to address the social effects and the heritage and archaeological effects associated with a new WTP at the four short listed sites, and to provide expert scoring of the relevant criteria for the short listed options. A traffic specialist was also engaged to assess site access and the traffic effects associated with the construction and operation of a new WTP.

All of the other experts reviewed their assessments during this stage. A list of the experts is provided in **Attachment 2**.

The first round of community consultation was undertaken at this stage. This included public meetings in February and open days in April. No public consultation had been undertaken prior to this point as any earlier consultation would have involved Watercare presenting the various options to the individual communities, with the associated uncertainty that such discussions would have generated. Feedback was sought from consultation with the Oratia and Titirangi/Waima communities.

The most significant of the additional shortlisting investigations has been the undertaking of a SIA of the four options. SIAs are the most common framework used in New Zealand and internationally to analyse, monitor and manage the potential social consequences of a development. The author utilised the seven social impact matters described in the International Association of Impact Assessment guidelines to underlie the assessment. The process took into account the potential social impacts of the WTP, on the basis of the existing community, the nature of the proposed works, and the consequential social changes anticipated.

The SIA included face-to-face and phone interviews with members of the Oratia community (for Parker Road North and South options) and Titirangi community (for the Manuka Road option and Existing Site option). Over 50 interviews were undertaken (with over 150 people participating in these interviews).

On the completion of this additional work, a MCA process of the four shortlisted options was initiated. The process consisted of a series of challenge workshops.

Challenge workshop 1

A challenge workshop was held on 13 April 2017 involving Watercare, legal counsel, project team members and the subject matter experts. Subject matter experts prepared an initial score for the relevant criteria (i.e. within their field of expertise only) and a rationale for this based on their assessments, with scoring debated and a preliminary score confirmed through this workshop.

Challenge workshop 2 (Operability)

Watercare operations staff held a challenge workshop on 29 April to address the operability criteria. This was also supported by a memorandum prepared by Watercare Operations Specialists regarding the operability of the four sites and associated ancillary infrastructure.

Challenge workshop 3

The third challenge workshop was held on 16 May 2017 involving Watercare, legal counsel, project team members and subject matter experts, with the exception of the Traffic and Transport Specialist who was unable to attend and the addition of the Noise Specialist.

The scoring for the noise criteria was canvassed and confirmed at this workshop. The scoring of the operations criteria was also canvassed amongst the wider project team and subject matter experts within this workshop. This approach enabled the wider project team and subject matter experts to take into account the noise and operability assessments and consider whether or not their scores would change taking into account this additional information.

All scores were then individually confirmed by each of the subject matter experts through the course of this final challenge workshop.

The analysis was undertaken without any specific consideration of potential mitigation, nor cost, or risk to the water supply system.

4 MULTI CRITERA ANALYSIS

4.1 Discussion

4.1.1 Technical/Engineering

The Parker Road North site provides the greatest level of flexibility for routine plant operations and future proofing opportunities for an asset that is required to serve the people of Auckland for the next 100 years. The Existing WTP and Manuka Road sites are more physically constrained, which introduces both design and operational complexity. There are issues amongst all options that introduce complexity to future system operation, a number of which are covered below.

Headworks

Upgrade of the raw water aqueduct for the Manuka Road option will be complex as it is likely that this will take place once the new facility is in operation. This will require the new WTP to be supplied by the Upper Nihotupu Dam only, introducing significant operational risk. However, the extension of the Lower Nihotupu rising main to Exhibition Drive to meet a new falling main from the Upper Nihotupu Dam to form a Combined Nihotupu Raw Water main provides an opportunity to greatly enhance the resilience of the raw water supply to the 'Manuka Road' site. A combined raw water main running in parallel to the Combined Huia Raw Water Supply via the raw water aqueduct would both facilitate aqueduct shutdowns for maintenance/upgrades.

The benefit of a completely new raw water supply line from Mackie's Rest to the Parker Road sites will be complicated by the operation of a deep raw water tunnel. However, this asset will be designed to operate for 100 years meeting all current standards and codes.

All options require raw water system pressurisation to facilitate discharges in the Headworks to minimise the volume of water discharged at each site. Additional system design is required at Mackie's Rest to achieve this. Pressurisation of the supply to Parker Road sites can be achieved relatively simply. Hydraulic limitations of the existing aqueduct increase the complexity of design required to achieve this at the Existing WTP and Manuka Road sites.

Treatment

All WTP options require the design and construction of new process units to meet current and foreseeable raw water quality challenges. The new facility will be required to meet all water treatment process performance, reliability and resilience objectives. WTP design will ensure that operability and maintainability meet current standards and codes, this will be more complex on the Existing WTP and Manuka Road sites due to their physical characteristics.

The Existing WTP currently has a generator that allows for operation at maximum production capacity in the event of a power failure. Standby power generation requirements are likely to be greater for the Existing and Manuka Road sites given the need to lift water to a reservoir top water level of 128mRL. Power generation requirements for the Parker Road sites will be lower as the treated water pump lift will be less.

Existing Site

The Existing WTP site poses the greatest challenges with regard to water supply system operation, including the development and commissioning of a second Waikato WTP and the operation of a complex facility on steep terrain complicating movement of vehicles on this site.

Space constraints are likely to result in an inability to effectively remove significant Health and Safety (**H&S**) hazards such as confined spaces and introduce operational complexity associated with multi-storied structures/tanks. This is relevant for the Manuka Road site as well.

Utilising the existing raw water aqueduct as the sole supply in an unpressurised configuration results in the inability to rapidly shutdown or reduce flows into the plant if process issues requires a flow reduction or diversion. This combined with a lack of space for off-spec water attenuation means a full capacity overflow is required and would be discharged to the Manukau Harbour.

Manuka Road

This site provides the opportunity to construct and commission a new facility while the existing asset is in-service on a site that is not as constrained as the Existing WTP site.

The Manuka Road option will require the operation of assets at three distinct locations, namely the raw water pump station adjacent to the existing facility, the WTP and the reservoirs, while not favoured from a general operability, H&S and security management perspective it is feasible given the relative proximity.

Development of a new raw water main that supplies water from both the Lower and Upper Nihotupu Dams to the Manuka Road site, presents an opportunity to reduce the level of risk associated with the rehabilitation of the raw water aqueduct and potentially improve system efficiency by reducing the scale of raw water pumping.

Parker Road Sites

The Parker Road Sites provide the best opportunity to develop a facility that will meet all WTP statutory compliance and performance objectives while minimising operational, H&S and site management complexity. The Parker Road North site provides the greatest WTP layout flexibility while providing the best hydraulic configuration.

Proposed attenuation structures provide a great deal more operational flexibility and environmental mitigation than those proposed for the existing and Manuka Road sites. Operating and managing a large single site is more efficient than operating over three distinct locations, particularly from a security and H&S (lone worker/site access management) perspective.

The ability to restrict all of the flow into the WTP, through a pressurised raw water supply, and the scope for a large attenuation lagoon provide a greater assimilative capacity of the waterway of any off-spec discharged when compared to Manuka Road, is an advantage for this site.

Given the reliance on electrified boundary fences as the primary method for site security, the two Parker Road sites have the advantage of flatter topography and greater space for clearance from trees to provide more trouble-free operation of these fences.

Transmission

All options include new treated water reservoirs and connections to the North Harbour No.2 pipeline.

The North Harbour No.1 and North Harbour No.2 water mains will be operated at the same hydraulic grade to maximise system interconnectivity and water supply resilience.

Existing and Manuka Road sites (Woodlands Park Road Reservoirs)

The existing transmission system has been designed with treated water entering from the existing WTP in its current location. A new treatment plant located in this area provides the opportunity for easier connectivity between the existing systems and the North Harbour No.2. This connectivity will require the relining/pressurisation of the Treated Water Aqueduct and reconfiguration of the inlet to the Titirangi Reservoirs.

The ability to supply both the North Harbour No.1 via the Titirangi Reservoirs and the North Harbour No. 2 directly, provides a greater level of transmission system resilience, given that there is the potential for two distinct treated water supply routes.

The Woodlands Park Road Reservoirs will be operated with a top water level of 128mRL. Pressure reduction will be required to achieve the operability requirement described above.

Parker Road sites

These require an investment in transmission assets to enable the treated water to be distributed with similar operational flexibility as provided by the existing WTP and the Manuka Road sites. There may be additional short-term operational complexity associated with the transmission system, from this site until the completion of the North Harbour No.2 and interconnections.

The Parker Road South Site would require the construction of a treated water main through private property which poses a risk to operability and long-term asset management.

4.1.2 Environmental

Ecology

Three of the four short listed sites have the potential to generate significant adverse ecological effects, and mitigation of these effects would require substantial offsite mitigation in every case. Ecological effects arising as a result of the Manuka Road option is assessed as being marginally less severe than the Existing WTP or Parker Road South options, as part of this site comprises a more modified, recent vegetation type.

In contrast, development of the Parker Road North site would have no substantive adverse ecological effects.

The mature natives on Woodlands Park Road (reservoir site) are Kauri (3 with diameter of over 1m, 2 between 0.6m and 1m), Totara (2 > 1m) and Kahikatea (3 > 1m, 2 between 0.6m and 1m), on Manuka Road, Kauri (1 > 1m, 2 between 0.6m to 1m), Rimu (1 > 1m) and Kahikatea (1 > 1m and 2 between 0.6m and 1m) and on Parker Road South, there are a number of significant Kahikatea which lie within two small streams and a wetland.

Social

The potential social effects during both construction and operation for the Parker Road options are likely to be high to very high due to effects on community cohesion and way of life, the ability to sustain these matters and to a lesser extent, quality of the environment.

A new WTP on the Existing WTP site is likely to have lower social effects during both construction and operation. The construction impacts are negative due to trenching required on local roads which is likely to cause disruption and effect on the community's way of life and the quality of the environment which they enjoy. However, due to the existing WTP being in the same locality, the effect during operation are generally low to very low (negligible).

For the Manuka Road option, the potential effects during construction are likely to be moderate due to effects on people's way of life and quality of the environment. This is especially so, given the site has been designated for water related services for many years. There are some negative effects during operation, particularly for people's way of life, however given the smaller number of people affected, the nature of the community and accessibility for that community and the existence of a WTP in a similar location these effects have been assessed as being generally lower than for the Parker Road options.

The potential loss of the track off Manuka Road into Clark's Bush Reserve (an area of native bush that lies adjacent to and south of the Manuka Road site) was seen as a negative effect by many in the community, who were under the impression that the Manuka Road site was part of the reserve. They also considered that the removal of the trees on the site would have effects on the integrity of the reserve.

Traffic

The key differential between the sites are that the Existing and Manuka Road sites have good road and site access and trenching and construction traffic are proposed to be on separate corridors and consequently have less effects on the road network. The trenching and construction traffic can be safely accommodated on the road network with appropriate traffic management.

Whereas Parker Road North and South have constrained road access due to Parker Road geometry (e.g. narrow in some road sections). The geometry and capacity constraints of the

no exit road would require the trenching and construction traffic to be managed as a one-way road. This will impact on the construction programme and affect the use of the road by the residents.

The traffic implications of Parker Road became apparent during this additional investigation phase.

Landscape and Visual

The four sites all have the potential to generate adverse landscape effects – ranging from moderate to moderate / high and high. Similarly, adverse visual effects ranging from moderate to high have the potential to be generated albeit also with the potential for some reduction in the level of effect over time as on-site mitigation planting and screening is achieved.

On balance, using the Existing site has the advantage of avoiding the disruption of introducing a non-residential activity into a residential neighbourhood. However, that site requires the extension of works to multiple sites in a more intensively inhabited location. The Manuka Road site would result in the greatest adverse effects, both landscape and visual, primarily due to the clearance of significant indigenous vegetation.

Property Effects

Watercare owns both the Existing and Manuka Road sites so there would be no direct property effects.

Parker Road North would require five properties (seven homes) to be purchased for the plant and an additional five properties around the plant for remedial/buffer planting.

Parker Road South would require seven properties (within the footprint of the plant) and eight other sites that lie within the 2002 subdivision that created 152 Parker Road. These eight sites share (or are adjacent to) the accessway to the proposed site.

Noise

Although construction noise would be audible at the neighbouring homes at all the sites, the levels would be expected to comply with the required construction noise standard. Keeping the neighbours informed of the project during the construction phase and keeping construction to normal construction hours would be sufficient.

The Existing and Manuka Road sites have a large number of properties nearby. The plant would require the highest level of acoustic treatment to mitigate the noise generated by its operation to comply with the night-time limit of 40dB LAeq. The two Parker Road sites have considerably less properties that would potentially be affected by noise, and noise mitigation would only require conventional noise control methods (therefore more cost effective).

Heritage

The study found that of the four options, the only one that will have high adverse effects on identified historic heritage values will be the upgrading of the existing plant, as any changes will affect the defined Extent of Place of a known historic heritage place, which is scheduled in the Auckland Unitary Plan (Operative in Part) (**AUPOiP** – Huia Filter Station schedule of Significant Historic Heritage Places (UPID00077) Category B. However, the actual Filter Station building will be retained with the ongoing use of this heritage structure for which it was originally constructed.

The other three options will involve the removal of the redundant facilities within the existing plant. The heritage structures will be retained. These have the ability to be repurposed, however there is currently no policy or plans to use the heritage structures for any specific purpose. The other sites have scheduled features but these will not be impacted on.

Mana Whenua

The project has been presented at Watercare's Mana Whenua Kaitiaki Forum. Four mana whenua have registered an interest in the project. Of these, the only mana whenua that has requested involvement at this stage is Te Kawerau a Maki. They have provided a Cultural Value Assessment. The document is general in nature and does not raise any concerns regarding any of the subject sites.

The other mana whenua have requested that Watercare contact them once the decision on the location of the WTP is determined.

Consultation

Public meetings have been held with the two communities that may be affected by the options. In addition to these, open days of the existing WTP were conducted over a weekend with over 320 people attending.

Letter drops have been conducted in the two communities and a project specific web page has been provided on the Watercare web site. The most relevant reports have been uploaded to this site.

Watercare has also received over 1,600 written responses/comments from the communities.

The majority of those that have expressed concerns with the two Parker Road sites have focussed on the possibility that families will lose their homes and made to move out of the community and the introduction of a large industrial plant into a community/area that has fought hard to retain its rural heritage. The affected families have strong ties to Oratia, several being the sixth/seventh generation to live on the land/road. The tight property market in the neighbourhood, would force these families out of the community.

The comments from the Waima community focus on the site's physical characteristics, in particular the loss of vegetation cover, Clarks Bush Track and stability. The other concerns include; traffic, visual and safety of the plant.

In addition to receiving written responses/comments from members of the community, comments have been received from the Titirangi Residents and Ratepayers Association, the Waitakere Heritage Protection Society, the Oratia Heritage Society. These groups generally expressed concerns regarding the displacement of the residents on Parker Road and were generally supportive of the Manuka Road site subject to the plant being in a sensitive manner with regards to the vegetation on the site and its location. The Auckland Botanical Society noted that there were several rare tree species on the perimeter of the site.

4.2 MCA Results

Following the close of the challenge workshop, legal counsel and Watercare reviewed the draft proposed weightings. Scores were then entered into the MCA spreadsheet and an overall score generated for each site to enable a ranking and comparison of sites.

In order to further analyse and test the ranking of the sites and inform the overall decision making, additional weighting and sensitivity analysis has been undertaken. Prior to undertaking this analysis, the scores were 'normalised', that is, all criteria were proportionally weighted to ensure areas with more sub-criteria were not inadvertently outweighing those areas with less sub-criteria.

The baseline scores and the normalised scores for the four shortlisted options are set out in Table below. This ranks the sites as follows:

- Manuka Road
- Parker Road North
- Existing Site
- Parker Road South

Criteria		Maximum baseline score	Manuka Road	Existing Site	Parker North	Parker South
Technical / Engineering	Key site characteristics	20	15	13	16	15
	Constructability - site and ancillary structures	35	22	14	30.5	26.5
	Operability	15	10	9	12	11
SUB TOTAL TECH. / ENGINEERING BASELINE SCORE (MAXIMUM 70)			47	36	58	52
NORMALISED SCORE (MAXIMUM 30)			20.43	16.5	24.7	22.13
Environmental	Traffic effects	20	16	16	10	10
	Heritage and archaeology	5	4	2	4	5
	Noise effects	10	8	7	10	10
	Ecology	10	5	4	9	2
	Landscape and visual effects	10	4	6	6	5
	Social effects	15	13	14	4	6
SUB TOTAL ENVIRONMENTAL BASELINE SCORE (MAXIMUM 70)			50.2	49.4	42.6	37.4
NORMALISED SCORE (MAXIMUM 60)			41.8	38.6	40.4	35.6
Property impact		5	5	5	1	1
TOTAL (MAX 145)			102.11	90.4	102.05	89.95
NORMALISED TOTAL (MAX 100)			72.23	65.1	67.1	59.73

Table 1: Baseline and Normalised Scores

These scores were then subject to a weightings/sensitivity analysis.

A number of weightings were applied to the normalised baseline scores as follows (and as shown in Table 2 below):

Criteria	Manuka Road	Existing Site	Parker North	Parker South
BASELINE / NORMALISED SCORE	1	3	2	4
RMA WEIGHTING – SECTION 6 MATTERS OF NATIONAL IMPORTANCE	2	4	1	3
OVERALL RMA WEIGHTING –INCLUDING SECTIONS 5 AND 6	1	3	2	4
TECHNICAL WEIGHTING	2	4	1	3

Table 2: Baseline and Weighted Scores Analysis

Overall, the above analysis indicates that in respect to the matters considered in the MCA process, the ranking order of the sites is:

- Manuka Road / Parker Road North
- Existing site / Parker Road South

It is important to note that the MCA process is a tool used for expert assessment of a number of options. The experts do not generally consider issues that are within the purview of the client such as broader risk matters and cost of the options.

5 COSTS

The following table sets out the costs associated with the construction and operation of the options.

Note that the costs associated with building a new WTP on the existing Huia site will require the shutdown and demolition of the existing water treatment plant. This will create a shortfall in peak production of up to 126 MLD for a construction period of two to three years. This will require the 126 MLD production capacity to be replaced by an alternative source.

The Waikato River has been identified as the preferred next water source for the Auckland region. To utilise the Waikato River as the replacement source would require Waikato Regional Council to grant the abstraction resource consent and the advanced construction of stages 1 and 2 of the proposed Waikato 2 water treatment plant. This would mean 94% of metropolitan peak production capacity will be sourced from the southern region while the Existing WTP was shutdown.

Approximately \$660M (\$real) of Asset Management Plan (**AMP**) capital programmes will need to be brought forward in advance of shutting down the existing WTP site to meet production requirements and improve resilience. The capital programmes include:

- Waikato 2 WTP (stages 1 and 2);
- Waikato 2 watermain;
- Second Redoubt and Pukekohe East Reservoirs;
- North-West Reservoir storage; and

- South-West boost pump station in operation.

The existing plant has the least favourable Net Present Value (**NPV**) and would cost \$141M more than the Manuka Road option. This is due to the requirement to bring forward the construction of the second Waikato Treatment Plant. Due to the high cost of this option, uncertainty of obtaining necessary resource consents for the Waikato River abstraction and increased risk of reliance on southern water sources during the construction of the replacement existing WTP, this option is not being considered further.

The Manuka Road plant has a marginally less favourable NPV than the Parker Road options, over the 35 year period, the primary reason is the need to upgrade the existing raw water network into the plant. This higher cost needs to be balanced against the benefits with respect to resilience that the two pipes into the plant will provide.

Stage	Existing Site \$M	Manuka Road \$M	Parker Road North \$M	Parker Road South \$M
Capital				
Water Treatment Plant	146	153	147	148
Ancillary Structures (inc P&G)	93	83	92	90
Design, Consents, Land purchases	46	49	62	73
Specific Construction Risks	27	32	33	29
TOTAL (\$Real)	312	317	334	340
Upper Bound (+25%)	390	396	417	425
Operating				
Opex (Annual)	3.35	3.35	3.23	3.23
NPV				
Raw water system upgrades	86	86	58	58
NPV 35yr including all raw water upgrades	-408	-412	-403	-408
NPV 35yr including all raw water upgrades and Waikato Water Plant – adjusted for existing WTP replacement only.	-1,180	-1,039	-1,030	-1,036

Table 3: Cost of Options

6 CONSENT REQUIREMENTS

The following table sets out the key approvals that are likely to be required for each of the options. The reference to Waikato in the Existing Site column is the need to gain resource consent for the second water take from Waikato River and associated consents with regards to constructing and operating a second Waikato WTP, prior to undertaking the upgrading work at the Existing site. The second WTP site for the Waikato is already designated for water treatment purposes and therefore the construction and operation of the plant itself would require an OPW.

All four sites would require additional design work and investigations to provide a sufficient level of evidence to support any resource consent application and/or Notice of Requirement.

Consent	Existing Site	Manuka Road	Parker Road North	Parker Road South
Notice of Requirement			✓	✓
Outline Plan of Works	✓	✓	✓	✓
Vegetation removal	✓	✓		✓
Earthworks	✓	✓	✓	✓
Other regional consent requirements (incl. stormwater discharge Permit)	✓+	✓	✓	✓
Discharge Permit Off spec water	✓	✓ May be able to rely partly or fully on the existing discharge consent	✓	✓
Water Permit Waikato	✓✓			
Outline Plan of Works (Waikato)	✓			
Land use consent (Waikato)	✓✓✓			
Discharge Permit (Waikato)	✓✓✓✓			

Table 2: Statutory Requirements (Nos. of ticks indicate number of consents required)

The Parker Road sites would require the preparation and lodgement of a Notice of Requirements as well as the required “regional” consents (earthworks, stormwater and off spec water discharges). Parker Road South would also require consent to remove vegetation as areas of the site are subject to an SEA overlay. An OPW would subsequently be provided to Council.

From a consentability perspective, the designation of the Existing and Manuka Road sites for water supply/treatment purposes negates the need to gain approval to construct and operate the plants on these two sites. Although the designation would require Watercare to lodge an OPW for either site with the Council, the Council cannot decline an OPW, but rather request changes to the physical aspects of the proposal.

The PAUP imposed a SEA overlay over the three Watercare owned properties. The removal of the vegetation on both Manuka Road and Woodlands Park Road will require consent as a discretionary activity. The need to remove a considerable area of native vegetation is likely to attract intensive scrutiny from the Council and broader opposition generally. The removal

also does not find support from the policy framework. The removal of the vegetation will require off set mitigation sufficient enough to achieve a net gain.

The only other consents that may be required for these sites are for earthworks and stormwater discharge. The amount of the earthworks and discharge may require consent as a discretionary or non-complying activity. This will only be determined following the design of the Plant. Watercare currently holds a consent to discharge off-spec water from the existing WTP to a lagoon and then into the Armstrong Gully (Little Muddy Creek).

In addition to gaining these approvals, building on the Existing site would, as outlined above, require a second consent for Watercare to take water from the Waikato and associated consents. The need to demonstrate that Watercare is making the most efficient use of the current water supply may be a prerequisite to gaining consent to extract the additional water from the Waikato River.

The need to gain these consents introduces a level of uncertainty that effectively exposes this option to a high level of risk. In addition to this risk, the lack of any ability to establish a detention pond on the site would require any off spec water to be piped directly to the Manukau Harbour. Previous experience would indicate that gaining consent to discharge water into the harbour in this manner would be difficult.

7 OTHER CONSIDERATIONS

Exhibition Drive

Watercare currently owns land between the former Nihotupu Filter Station and the Lower Nihotupu dam water catchment land. This land is commonly known as Exhibition Drive. The land contains large areas of rejuvenating bush, Watercare's raw water pipelines and a popular walking track. Apart from access to operate and maintain the existing pipelines, and in the future install replacement pipelines and a reservoir, much of the land is not required for Watercare's purposes.

Watercare recognises the importance of the walking track and wants public access to be maintained in the future. Accordingly Watercare and Council staff have been investigating opportunities to improve the management of this asset going forward. The preferred option is for the land to be transferred to Council which better recognises the environmental, recreational and historical importance of the land. It is noted that this is similar to how the water catchment parkland is managed.

Due to constraints under the Local Government Act 2002 the land cannot be directly gifted to Auckland Council and a protocol has been established to transfer assets between CCOs and Council. Watercare has a large portfolio of future capital works elsewhere in Auckland and additional land will be required to undertake this. Watercare is working with Auckland Council to determine what opportunities exist to transfer surplus Council land for Exhibition Drive. Any such land transfer would be in accordance with the Local Government Act and the Auckland Council Asset Transfer Policy.

Clarks Bush Track

Currently the western end of the Clarks Bush Track passes through the south western corner of the Manuka Road site. Clarks Bush lies to the south of the site. Similar to Exhibition Drive, Watercare recognises the importance of the walking track and wants public access to be maintained in the future. The track could potentially be realigned up thorough the site/Clarks Bush to Scenic Drive. The realignment of the track would involve consultation with Auckland Parks and the local community.

Heritage Buildings

Considerable work has been carried out towards preparing a heritage strategy for the heritage listed buildings, Huia Filter Station and the Nihotupu Filter Station. It is anticipated that due to the heritage status of the Huia building and adjacent filter tanks, these will be retained while the rest of the plant may be demolished. Further work will be required to develop a comprehensive strategy for the future of this building and tanks and the Nihotupu Filter Station.

Existing WTP Site

There are currently no plans with regards to the future use of the existing site if it is not the preferred option. The retention of the site would allow Watercare the opportunity to utilise the site for water treatment purposes in the future.

Off-set Mitigation

Watercare accepts that the removal of native vegetation from the Manuka Road site would have an adverse environmental effect. Accordingly Watercare will be looking to provide appropriate off-set mitigation.

Watercare has recently acquired the company which operated the forestry rights in the Hunua Ranges. The rights have been sold for a much smaller area providing Watercare with the opportunity to revegetate large areas of pine forest with natives. It is planned to plant around 230,000 native plants over the next two years.

8 PREFERRED OPTION

The Parker Road North and Manuka Road sites are very similar on the balance of technical, environmental and costs.

Following further expert analysis, including the preparation of a SIA, it became apparent that the construction and operation of the WTP on the Parker Road North site would have adverse effects on the community's cohesion and way of life whereas for the Manuka Road site, the effects would primarily be on the vegetation, Exhibition Drive and Clarks Bush.

Watercare has long held a designation over the Manuka Road site and this has signalled to the community the potential for the construction and operation of a water treatment plant on the site at some stage.

The operation of an existing WTP has been on the site for 89 years and is an established part of the community.

Watercare can mitigate the ecological effects on the Manuka Road site through off-set mitigation, however it would be difficult to fully mitigate the social effects' associated with developing the Parker Road North site.

The Preferred Option for the replacement of the Huia WTP is the Manuka Road option. Preference for Manuka Road option, has been determined through assessing the shortlisted options through the MCA process, the consideration of the costs for each and the other matters outlined in this report, in particular the designation of the sites for "water supply purposes Huia and Nihotupu water treatment plants and associated structures". The purpose of designations is to protect and facilitate the construction and operation of a public work or project. In this case, the designation has signalled to the communities that such a plant may be established on the sites at any time.

The final layout of the facility will be optimised to minimise the extent of the vegetation removal, particularly the trees around the perimeter of the site.

The preferred option involves the construction of a 140MLD plant on the Manuka Road site. Two 60 metre diameter reservoirs are proposed to be constructed on the Woodlands Park Road site, which lies opposite the existing plant. The reservoirs will be approximately 8 metres in height and be above ground or partially buried.

The existing off-spec lagoon on the existing WTP site will be increased in size to accommodate any off spec water from the plant. The water will be discharged in a similar manner to the current practice from the existing WTP.

In addition to these elements, the option will involve the upgrading of the raw water system into the plant from the dams and the treated water pipes from the plant.

9 CONSENT FRAMEWORK / PROGRAMME

The next phase of work in the process is for the project team to develop an approach that will allow the fulfilment of all the project's objectives of replacing the existing WTP, obtaining consent and providing a resilient supply of water.

As Watercare's AMP sets out that the Plant will be in operation in 2023, it is envisaged that the initial consents (removal of vegetation and earthworks) that are required to facilitate the construction of the plant on the site will be sought once the outline scheme design has been completed.

These applications will require additional investigations, in particular with regards to the adverse effects on ecology of the site, the potential off-set mitigation and the optimised layout of the site.

The high profile of the project would suggest that Watercare would either seek the application(s) to be publicly notified, if lodged with the Council, or seek direct referral to the Environment Court.

The timeframe to a consent hearing will depend on Council's or the Environment Court's schedule. It is anticipated that a hearing for either approach will be scheduled in 2018.

10 MEASUREMENT OF PROJECT SUCCESS

The success of this project will be measured by constructing and operating a replacement for the Huia WTP that:

- Allows for more advanced process configuration to address water quality targets,
- Addresses the seismic design requirements, and
- Addresses the hydraulic limitations of the existing plant.

11 RECOMMENDATION

It is recommended that:

1. The preferred site for the replacement Huia Water Treatment Plant be on the Watercare owned Manuka Road site, with reservoirs constructed on the Watercare owned Woodlands Park Road site; and
2. The statutory approvals be sought to allow the Huia Water Treatment Plant replacement to proceed.

Prepared by: Paul Jones

Recommended by:



pp

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Mark Bourne
**Manager
Infrastructure
and
Environmental
Planning**

Reviewed by:



pp

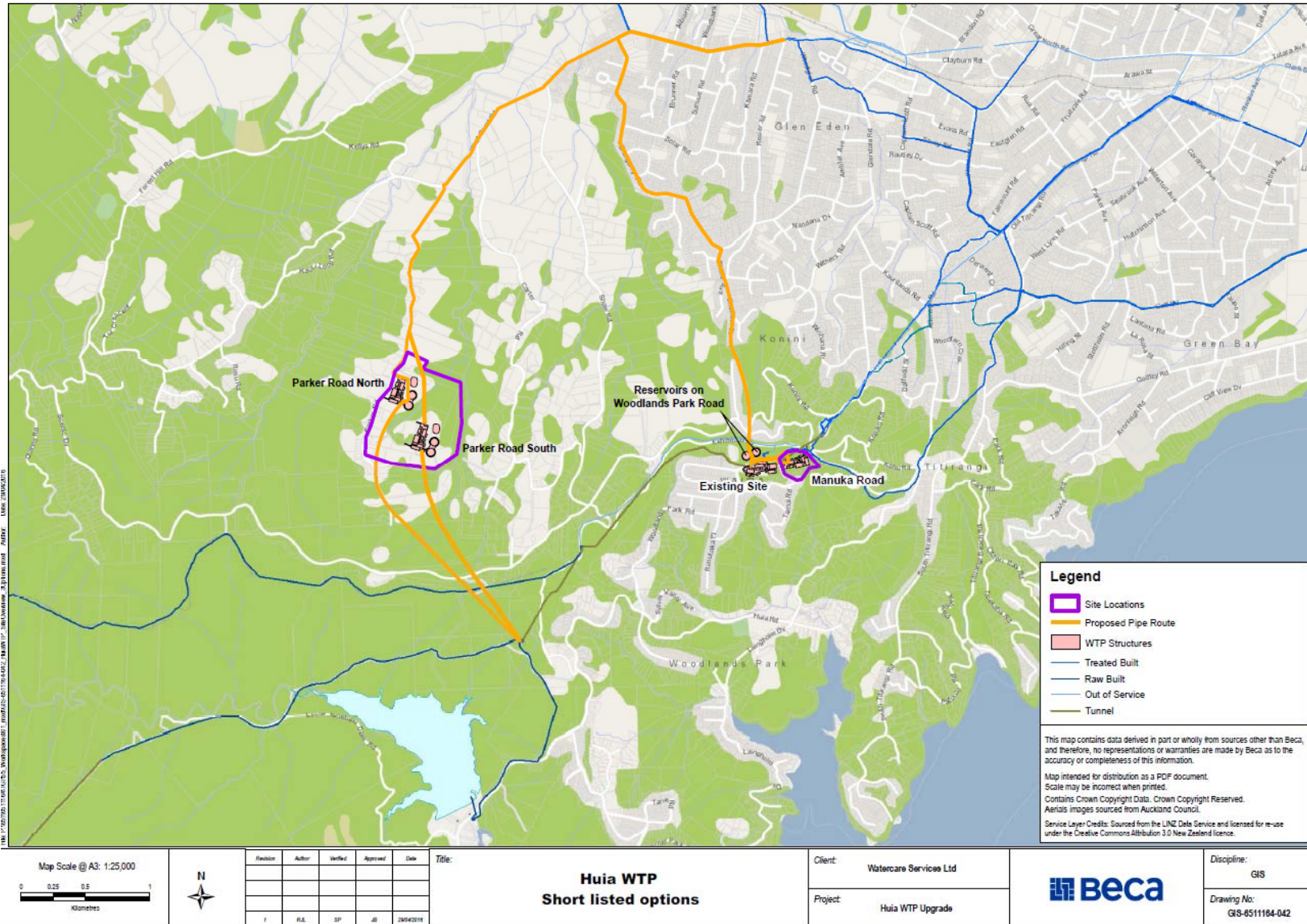
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Martin Smith
**General Manager
Strategy and
Planning**

Approved for submission by:



.....
R. Jaduram
Chief Executive

Attachment 1



ATTACHMENT 2

Consultant experts involved in the MCA process were:

Karen Baverstock – Planner – Tonkin & Taylor (Principal Planner)

Bill Loutit – Solicitor – Simpson Grierson (Partner)

Jack Brennan – Water Engineer – Beca (Associate – Water)

Amelia Linzey – Social Impact – Beca (Senior Technical Director – Planning)

Scheepers Fourie - Traffic Engineer – Beca (Senior Transport Planner)

Sarah Flynn – Ecologist – Boffa Miskell (Associate Principal)

Rachel Lambert – Landscape Architect – Boffa Miskell (Partner)

Christian Gambit – Water Engineer – GHD

Matthew Cottle - Noise – Marshall Day (Consultant)

Kim Tatton – Archaeologist – Gough and Associates