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ORDINARY MEETING OF COUNCIL

Open Minutes Attachments

Meeting Date:	Thursday 22 April 2021
Time:	10.00am
Venue:	Council Chambers Hawke's Bay Regional Council 159 Dalton Street Napier

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Napier City Council

Chlorine Free Strategy Peer Review

March 2021

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1. Overview

1.1 Background

Napier City Council (NCC) engaged GHD to undertake a peer review of the report prepared by PDP on a pathway to Chlorine Free Drinking Water. The review was carried out by Peter Free and Helen Barclay from GHD, with input from Henk Ketelaars (Principal Waster Quality Manager from Evides Water Company, now retired) and Gerard van Houwelingen (Principal process engineer at Royal Haskoning DHV) who are both based in the Netherlands.

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1.2 Review process

Our review of a draft version of the report dated 12 October 2020 allowed for a collaborative approach with PDP. During our initial review we consulted with both NCC (20/10/2020) to provide clarification on the scope of work, expectations, and requirements of the report, and with PDP (27/10/2020) to gain an understanding of their approach and provide feedback on areas requiring further attention.

Our review of the initial draft report concluded that the report to be well written and provide a thorough assessment of the options, risks, and pathway forward to becoming chlorine free. It was apparent at the draft stage that the options and pathway to chlorine free sections were still in development. Clarity was needed on how the options were presented and what was involved. It was difficult to review the costing due to a lack of background information available at that stage.

A second version of the PDP report dated 01 December 2020 was reviewed by GHD and feedback provided to PDP (15/12/20, 18/01/21). This included greater details on the cost information, allowing for a more thorough review.

2. Final Review and closing remarks

PDP provided an updated draft of the report dated 01 December 2020. The review team assessed this report with the recommendations made previously in mind (section 3). GHD were able to confirm that most of the recommendations had been taken on board. Greater detailed was provided on the cost estimates, allowing for a high-level review. Overall the team are happy that most items identified in the initial review have been collaboratively remedied.

The following summarises any outstanding items of difference and our key enduring comments on the report.

Know your supply

- Bore security - more work is required to confirm the reason for the occasional poor water quality results before labelling bores as insecure
- Iron and manganese – there is a risk that the problem may partially continue in the short term despite treatment, as the problems are historic, however we agree the actions planned will achieve the required water quality in the medium term and will reduce the issue in the short term.

Know your network

- Current water losses are high, but the value is uncertain. A greater understanding of non-revenue water is required as 30% non-revenue water is likely to be overestimated, as discussed with NCC and alluded to in our Review memo document dated 28 Oct 2020.
- Improvements in metering are needed to fully understand real losses and therefore the appropriate renewal investment level needed

Know where you are going

- A leakage target of perhaps higher than 5%, could be justified, if online network loss monitoring is implemented
- Chlorine free is possible but is a long term goal that requires a mindset shift of all those involved in the water supply system.

Know how to get there

- A 3% per year rate of renewal is ambitious and may not be achievable or required.
- A better understanding of leakage, usage, and risk potential for a poor water quality event is needed before final renewal programme levels of expenditure are possible

3. Initial Review Findings

The following section provides a summary of discussion points raised during the initial review stages, and any outstanding issues based on an early draft of the PDP report dated 12 October 2020

3.1 General

The report was well written and provided a thorough assessment of the options, risks, and pathway forward to becoming chlorine free. The report is very clear that becoming chlorine free is a long-term goal that won't be easy to achieve and requires a mindset shift of all those involved in the water supply system. The risks and ability to gain approval from Taumata Arowai are identified.

While GHD provided a number of comments on the initial draft report, we were in agreement with the direction taken and the conclusions made in the report. The following summarises the comments made by the review team at this initial stage and the actions agreed with PDP during our discussions.

3.2 Understanding source

Our Dutch counterparts commented that "this is a drinking water engineer's dream". The focus needs to be on keeping the source free of contaminants and maintaining it well. In our opinion, upstream of the wells is the safest part of the system and the biggest risks are once the water is above the confining layers, so most attention is need on the wells, process of pumping etc.

The comments in the report regarding the security of the bore and possible pathways for contamination suggest a lack of good understanding of the source water in Napier's situation, and how the geological setting of the source water in Napier is quite different to the Havelock North's situation. The initial section on ground water source risks provides information on the Havelock risks, but at this point in the report, the details on the Napier setting is not yet described in detail. At our suggestion PDP are to review this section to make clear that the source water quality in Napier is good and that its geological setting sets it apart from Havelock North.

Recommendation – PDP to review this section to make clear that the source water quality in Napier is good and that its geological setting sets it apart from Havelock North

3.3 Biological stability

The report mentioned that the Dutch decision to go chlorine free is on the basis of biologically stable water. There is no comment made on the biological stability of the Napier source water. Testing of assimilable organic carbon would provide a quantitative assessment of this. Recognising that samples may need to be sent to Australia for testing of AOC, the exercise would still add value as it would give an understanding of the basic case for future consideration of risk throughout the whole of the system.

From our discussion with PDP we gathered that testing of AOC was discussed during the project but there were difficulties with sending samples and testing timeframes due to Covid.

Recommendation –include a recommendation to carry out testing for AOC when possible to provide baseline data and an understanding of biological stability.

3.4 Water quality data

GHD had concerns that the water quality data used in this report is based on sampling from both online and offline bores and that this may be affecting the relevance of the information presented.

For example, the turbidity data presented has readings as high as 40 NTU but it was not clear that this includes offline bores. The turbidity of ground water would be expected to be below 1.5 NTU when the bores are pumping. Some analysis was later presented comparing turbidity from grab samples with daily pumping rates. As turbidity sampling is not online, it is difficult to compare with a daily pumping rate and the value of including this information is questionable.

From our discussions with NCC we noted that since 2017 the bores are sampled either daily or every second day whether they are online or offline. The data set provided should include information as to whether the bore being sampled was online or not, and we suggest reviewing and excluding offline data where it is not relevant.

There is data presented on the microbial testing of the source water. We are also not sure if any of the bores that tested positive for total coliforms were offline at the time and recommend PDP confirm this.

To understand the need for iron and manganese reductions further water quality testing should be recommended to know the concentrations more precisely and the requirement for treatment.

Recommendation – PDP to review water quality data and exclude off line data where it is not relevant. It would also be useful to provide general water quality data an appendix to give an understanding of whether the water is aggressive or corrosive.

3.5 Bores

GHD noted that significant levels of drawdown can occur when the pumps are turned on and this issue can affect water security/quality. This could be caused by partly blocked screens, poorly maintained bores or screens that aren't big enough. This could be worth investigating further and is not mentioned in the report.

PDP acknowledged that they don't have water level data during pumping and were keen to gather more information on the levels and review and amend the report as required.

3.6 Monitoring requirements

The report noted there needs to be an overall improvement in water sampling and that this needs to go beyond the bare minimum required by the standards. Throughout the report many recommendations to improvements in water monitoring are made. These should be collated and summarised to be clear as to what is being recommended.

The response from PDP on this topic covered the cost and effort required to prepare a detailed monitoring plan, and at this stage we agreed that this is not needed. GHD suggested that a collation of the numerous recommendations on monitoring and further investigations made throughout the report would provide NCC with a sense of scale of the improvements in monitoring required.

3.7 DMAs

Ten DMA's were mentioned throughout the report and GHD questioned the rationale behind this and whether a plan could be included.

Discussion with PDP on the number of DMA's concluded that the ten DMAs mentioned in the report was a suggestion based on the information presented in the Master Plan. No further

changes are required other than to clarify that this is a suggested value at this stage and a detailed analysis of aims and objectives would be needed before an actual number of DMAs is set.

3.8 Dirty water issue

GHD's understanding is that dirty water isn't a problem all year round. The effect of using multiple sources can lead to flow reversal events, accentuating the dirty water issue. This is not recognised in the report and we suggest that further investigation into the frequency and occurrence throughout the year of the dirty water problem is needed.

PDP strongly presented the case for the removal of iron and manganese. It needs to be recognised in the report that there is a risk that treatment of the water to remove Mn and Fe may not solve the issue in the short term until affected pipes are fully cleaned or replaced. The reconfiguration of the network with a set of rising and falling mains is likely to reduce the number of flow reversal events which will aid in the reduction of dirty water events.

3.9 Reticulation

The Netherlands example of distribution based on a branched distribution network is provided. GHD suggest that PDP provide comment acknowledging the need to still meet NZ's requirements for firefighting flows with this layout.

There is brief mention in the report on pressure management zones without further information. Online pressure monitoring, along with software to control and manage changes in water supply pressure and to notify of any deviations is common in the Netherlands. Although this is not discussed in the report, we are satisfied from our discussions that PDP have considered this and have included it in their costings and plans for the future options of pressure monitoring devices.

A target of 3% renewals per year is a very ambitious target. PDP acknowledged this is an aggressive programme, but it is required to get to where NCC needs to be in the future. We suggest revisiting this target once better usage and leakage monitoring is in place with the view to reducing the target to a level that is more achievable in the long term.

3.10 Seismic considerations

While the report makes mention of earthquakes in the context of the outcomes from the Havelock North Inquiry, the risk profile of the chlorine free option needs to include the risk of seismic activity and potentially changes the design parameters for new assets. This is not addressed, and comment should be made on the material selection for renewals and the possible need for emergency chlorination.

3.11 Leakage

The leakage reported is very high which leads to questions about the accuracy of the data. We note that small changes in assumptions when calculating leakage can be significant in terms of the percentage leakage. We do agree that the low leakage target will be very challenging. We understand that there is an ongoing project to investigate further.

The development of an acoustic leak detection program could provide NCC with an early indication of the areas where the most need exists for renewals prior to a more comprehensive metering programme has been implemented.

As an aside, there is no mention in the report about the private network, and although this is not funded directly by NCC, improvements are likely to be required to meet leakage targets. Universal metering mentioned for the chlorine free options will assist with identifying leakage

within the private network, and additionally volumetric charging could provide incentive for improvements and repairs.

3.12 Options

The report needs to better communicate the pathway to being chlorine free and clarity on the options is required. The options are not at all well described and the reader does not get a good picture of what is involved. The features of the CF and SQ+ options are not described when then are first mentioned early in the report.

There is no assessment of what ongoing operational and maintenance needs might be required from NCC, especially regarding staffing, asset management, process and practices. Further clarity around monitoring requirements, data collection and analysis should also be provided.

It is understood that PDP were to append further information on the decision-making process.

3.13 Costs

NCC requested robust cost estimates to allow the community to commit to options with the knowledge that the costs would be in the right ballpark. The costings provided in the initial draft report did not allow for suitable review by GHD to confirm, as little information is provided on the scope of the works required for each of the options. There is no detail in the report on how the costings were arrived at, number of items, or what is included for each option. PDP have not yet provided further information to allow us to review the costs in any meaningful way.

Estimates are provided with a degree of uncertainty of +/- 60%. This may not be accurate enough for the purposes required by NCC. An accuracy of around +50%, - 25% would be more in line with our expectations.

Affordability needs to be considered and a breakdown of costs per connection would provide a sense of scale for the client. NCC are able to provide these using their rates calculator tool. Affordability will be dependent on funding method and PDP was to include further information on this.

3.14 Stake holder engagement

Stake holder engagement will be very important aspect of the journey to becoming chlorine free. Reasoning for any required improvements and costs needs to be well communicated. This can be expensive and needs to be allowed for in any costings.

PDP's response was that the cost of this won't significantly impact on the cost estimate but acknowledge that stakeholder management is in progress. Internal change management will also be important, especially with the impact of the water reforms and a change to the management of water infrastructure through a more centralised water company.

3.15 Better Business Case format

Whilst the introduction states that the report is loosely based around the Better Business Case approach, it is very loose. There is some confusion on the business case phases; it is stated in the report that the strategic and economic cases have been developed to a programme level, and in other parts it states that it's been developed to an indicative business case level.

To be more in line with the Better Business Case approach, the strategic context needs to report on the benefits of addressing those problems identified, risks, constraints, and dependencies. The Economic Case needs to identify the Critical Success Factors. The options identified appear pre-determined and the reported options assessment is light. There are

information gaps on the financial analysis, scenario work, management case and recommendations (as noted by report authors).

Discussions with NCC on the purpose of the report concluded that the better business case format was not essential.

Recommendation - remove reference to the Better Business Case format as the report is a highly technical feasibility study comparing options with the status quo.

PDP also suggested a more readable summary version of the report suitable for communicating to a wider target audience. We believe this would provide a better product with summary level detail for a wider range of stakeholders and a more detail report for individuals that want to understand to a greater extent the potential pathway to chlorine free, reliable and safe drinking water.

GHD


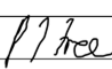
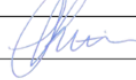
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Document Status

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Final	Helen Barclay	Peter Free		Amy Patterson Horner		18-03-21

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High Level Consultation Plan – Chlorine Free Review

The Project

Council has completed a 'Chlorine Free Review' to investigate the options for Council to supply water without chlorine, while meeting government standards for drinking water supply. The project included reviewing the status quo, with chlorine disinfection, but with upgrades, risk management and increased monitoring. The review was completed by experts from four different countries, and worked through the options and complexities around providing a safe chlorine free network and their likely costs.

The report has gone through a robust peer review process and presents three options for consideration:

1. **Status Quo (\$180m)** - Water Masterplan, basic level of leak detection, renewal rates below required, core level of asset management practice
2. **Status Quo Plus (\$220m)** - Water master plan, leakage reduction to reasonable level, mini networks and backflow detection, Intermediate level of asset management
3. **Chlorine Free (\$300m)** - All of the above plus aggressive leak reduction targets, sophisticated monitoring of water quality and network operation, advance level of asset management, universal metering, universal backflow, smart network.

Purpose

This consultation will inform the community of the review, its findings and Council's proposed next steps. The chlorine-free review is also a matter included in the Long Term Plan 2021-31 Consultation Document.

Significance and Engagement Policy

This project has resulted from the community feedback made to the Mayor and Council pre and during the last election campaign and has been a constant theme (along with dirty water) of community engagement for some time. Chlorine free water supply is a matter of high public interest. The management of water is of high importance to Māori, particularly with regards to upholding tikanga and cultural values. In recognition of this, a cultural assessment will be commissioned which examines the potential ways forward in the report and evaluates these against tikanga and cultural values. The Guardians of the Aquifer are a group that has maintained a high level of interest and interaction with Council requesting a chlorine free water supply many times.

Approach

The engagement activities provide the information contained in the review and clearly explain what it means for the Napier community. A range of engagement activities that are targeted to both the wider community and key stakeholder are planned. These activities aim to increase understanding in the community about the path to a chlorine-free future and provide a forum for the community to give feedback on our proposed approach to Water Supply. The review report is already on our website, along with a summary. Formal feedback will open through the LTP consultation process (14 April – 12 May 2021), with engagement activities for the chlorine-free review starting 22 April.

Key Engagement Activities

The following initiatives are planned for this project:

High Level Engagement Plan – Chlorine Free Review V2
April 2021

- Presentation to key stakeholders
 - The key stakeholders identified include Mana Whenua groups, Māori Committee, and the regional Joint Drinking Water Governance and Working Group. These groups will be invited to a presentation session which will provide information on the review, its findings and the possible next steps, along with a Q & A session.
 - Feedback will be sought at the presentation session(s).
- Facebook Live
 - A panel, comprising the Mayor, staff and representation from the review team will provide information about the review, its findings and possible next steps.
 - The community will be able to ask questions of the panel Facebook.
- Guest lecture
 - This will involve technical experts who will discuss the implications of the review and provide a deep dive into the review report.
 - Interested people will be able to attend and have their questions and concerns addressed by the technical experts.
- Community presentation
 - A meeting for the community to attend and learn more about the review and the possible path to a chlorine free future.
- LTP consultation
 - The chlorine-free review is a matter included in the LTP Consultation Document and consultation process.
- Print and digital media channels
 - These will be utilised to advertise other engagement activities, provide information on the review and encourage feedback.

Stakeholder Engagement

Stakeholder	Approx. timeframe	Tool
Māori engagement	April – June	Cultural Assessment – to be commissioned Presentation to Māori Committee and Mana Whenua entities Participation on FB Live Panel
Community-wide	April - May	FB Live – panel session Guest Lecture – Technical Expert Community meeting Long Term Plan Consultation Website information Print and social media
Other key stakeholders	April - May	Direct email with Review Report Presentations
Media	March - May	Media release post Council meeting Advertisements for engagement activities.