
Business Case - Te Anau Wastewater Discharge Method - Kepler Block

Record No: R/18/9/21931
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Approved by: Steve Ruru, Chief Executive

Decision Recommendation Information

Purpose

- 1 The purpose of this report is to enable the Committee to recommend a wastewater discharge method at the Kepler Block based on an updated and peer reviewed business case.

Executive Summary

- 2 This report presents the updated final business case (Attachment A) analysis of the discharge options considered for the Kepler site.
- 3 The previous business case was presented to Council on 13 December 2017, where the recommendations from previous committee meetings were noted. Council then asked for further work be undertaken to develop the design of a Subsurface Drip Irrigation (SDI) discharge system to enable a like for like comparison against CPI. At that Council Meeting, Council also gave approval for elements of the project to proceed that were not contingent on the discharge method being finalised. This included, for example, completion of the detailed design for the pipeline required to transport wastewater from the treatment plant through to Kepler.
- 4 Since Council's decision on 13 December 2017, a basis of design report has been developed for an SDI system to a comparable level of detail to the previously recommended Centre Pivot Irrigation (CPI) proposal. As part of this process further assessment of the CPI basis of design has also been undertaken and updated assumptions and design parameters, relevant to both discharge systems have been included in the revised business case.
- 5 The completed work has been reviewed and made available for 'comment' by Ecogent Limited, the wastewater engineers that previously acted for Fiordland Sewage Options (FSO). Council also engaged Mainline Aqua Limited as an independent peer reviewer.
- 6 As a result of the completion of the further work and peer review process Council can have confidence that the updated business case provides a like-for-like comparison of centre pivot v Subsurface Drip Irrigation methods. In this regard Mainline Aqua has commented:

"It is my opinion that the design basis report and cost estimates have been sufficiently challenged over the last several months to offer SDC a reasonable comparison between CPI and SDI systems for considerations in the business case review".

- 7 The updated business case is to be presented to the Te Anau Wastewater Discharge Project Committee, the Services and Assets Committee and the Finance and Audit Committee for review and comment prior to a final recommendation being provided to Council for consideration on 23 October 2018. At this point Council will be asked to make a final decision on the discharge method.

Options

- 8 The following options are evaluated through the updated business case which is presented as Attachment A:
- Option 1 - Consented CPI - \$17.6 million
 - Option 2A - CPI + Base flow Membrane Filter - \$20.1 million
 - Option 2B - CPI + Full flow Membrane Filter - \$20.8 million
 - Option 3 - SDI + Full flow Membrane Filter - \$22.2 million.
- 9 Each of the options above are expanded on further both in this report and in the attached business case.

Key Points of Contention

- 10 This section of the executive summary seeks to identify a list of key points where agreement could not be fully reached between the technical experts. Also included are areas of concern that have been raised by members of the community previously. The issues, point of contention and summary comments are identified below:

Issue	Contention / Perception	Summary Comments
Odour	CPI has the potential to create odour issues	Odour management is recognised as being an important consideration. The proposed additional membrane filtration coupled with a biological trickling filter at Kepler for odour control as well as the low hanging, low pressure, large droplet sprinklers (LESA) will assist in mitigating this issue.
Spray drift / aerosols	CPI spray drift may migrate to adjacent sites	Low hanging, low pressure, large droplet sprinklers (LESA) will mitigate this risk.

Issue	Contention / Perception	Summary Comments
Environmental performance	SDI provides better environmental outcomes	<p>Environmental performance is considered commensurate across the consented CPI and SDI options. SDI design has been based on a smaller discharge area (20% less) based on its use of membrane filtration. Acceptability of this assumption will need to be confirmed through the consenting process.</p> <p>The recommended Option 2A adds membrane filtration for CPI and while not strictly necessary for consenting purposes will improve effluent quality to a similar standard as that discharged through SDI.</p>
Storage capacity issues from saturation	CPI will not be able to discharge as often as SDI in a storm event	<p>Both discharge methods have limits to the quantum that can be discharged in storm events. The main difference is that SDI potentially has two to three days of additional irrigation before irrigation may be restricted or stopped. Mainline Aqua have noted that this difference could be reduced by the reduction in the area of the SDI field therefore potentially negating any benefit.</p> <p>Additional work undertaken has indicated that additional storage over and above consent volumes is required longer term but that there will be a difference in volume required between CPI and SDI. This has been accounted for in the costings for both options and can be staged to match development.</p>

Issue	Contention / Perception	Summary Comments
Storage capacity issues from saturation continued	CPI will not be able to discharge as often as SDI in a storm event	Further analysis has identified what is considered to be an appropriate level of storage for both systems.
Wheel track management	Create an ongoing maintenance issue due to development of ruts over time.	Contouring, drainage channels, wheel track orientation and interventions will further reduce this risk. The issues associated with this are well known and understood and are managed within current budgets and cost scope.
Bird Strike	CPI will increase the bird strike risk for the airport	An independent report has been completed which concludes that neither SDI nor CPI will increase bird strike risk provided a proactive management regime is implemented.
Maintenance	Comparative maintenance and operational costs	Operation and maintenance costs are outlined in the business case with the main differences largely due to increased power requirements and operator input associated with operating an SDI system.
Frost Impacts	Risk of frost impacting CPI infrastructure	Heat trace wiring and other designed protection measures are available to manage this risk. The issues associated with this are well known and understood and are managed within current budgets and cost scope.

Issue	Contention / Perception	Summary Comments
Financial	Opportunities for further value engineering ignored in association with SDI	Both CPI and SDI have been robustly reviewed for cost and risk to facilitate a reasonable comparison. There are potential savings and risks associated with both SDI and CPI. As noted by Mainline Aqua the information now available is sufficient to allow a decision on the discharge method to be made. Any move to reduce costs further at this stage will risk compromising long term operability.
Pipeline	The pipeline size could be reduced for SDI	The pipeline sizing is a function of flow required to be delivered. This is defined at 4,500 m ³ /day irrespective of the discharge method. Other considerations to be taken into account include retention time of wastewater in the pipeline and requirement to manage flows in the longer term.

- 11 Each of the issues identified above have been addressed either through the basis of design report, business case, commentary or commentary responses attached to this report. This report expands on each of these perceived shortcomings directly.

Other considerations

- 12 There are a number of additional matters that also need to be considered, which are outlined below:
- Resource consents*
- 13 The existing consent for the Kepler Block allows for CPI to be established without a requirement for membrane filtration. This consent will lapse on 22 December 2021 if Council is not able to show that it has given effect to the consent before this date or is able to have it extended.
- 14 The existing discharge consent to the Upukerora River adjacent to the settlement ponds expires on 30 November 2020. The legal advice Council has received (Attachment E) is that it has a reasonable chance of having the term of this consent extended through to 22 December 2021, to coincide with the lapse date for the Kepler consent but a low chance of extension beyond that date given recent changes to the regulatory environment.
- 15 Discharge by SDI method would require a new resource consent. Provided Council was successful with having the current Upukerora discharge consent extended to December 2021, it

is anticipated that an SDI discharge system could be designed and constructed within this extended timeframe. This would require, however, a straight forward consenting process with consent ideally being issued before September 2019.

LGA responsibilities

- 16 Section 10, Local Government Act 2002, requires that local authorities have a focus on the delivery of good quality infrastructure at the least cost. This requirement is generally consistent with the financial management principles, which require a focus on financial prudence.
- 17 Part 6 of the Act and in particular sections 76-81, outline the decision-making requirements which in summary require the assessment of the reasonable practicable options based on their advantages and disadvantages. For significant decisions involving land and water, Council is required to take into account the relationship of Māori cultural values with the land or water concerned and it is also required to consider community views.

Option evaluation

- 18 Each of the four options identified within the business case have been evaluated against a set of criteria based on environmental, cultural, social and economic values. The results of this evaluation are reflected in the following table:

Table 1: Scoring of Consented Scheme and Options

Key values	Evaluation criteria	Total weighted score			
		Option 1	Option 2A	Option 2B	Option 3
Environmental	Ability of scheme to obtain long term consents. ¹	1.30	1.30	1.30	1.04
	Adaptability of scheme to meet increased environmental standards	0.68	0.88	0.88	0.68
	Adaptability of scheme to meet increased flows and loads.	0.78	0.88	0.88	0.68
Iwi Acceptability ²	Extent to which scheme meets the aspirations of Iwi.	1.35	1.50	1.50	1.35
Social Acceptability	Extent to which scheme meets the social aspirations of the local community.	0.60	0.80	0.80	1.60
Economic	CAPEX	0.98	0.78	0.59	0.39
	NPV, Te Anau scheme plus Manapouri scheme	0.65	0.39	0.39	0.26
	TOTAL:	6.34	6.53	6.33	6.01

¹ Option 3 is likely to require variations to the existing consents.

² In the absence of Dean Whaanga of TAMI, Don Mowat (iwi representative on the Te Anau Wastewater Discharge Project Committee) confirmed that he generally agreed with the Representative Group's interpretation of the cultural acceptability of each option. The scoring was revised to reflect the iwi perception of the slightly better performance of Options 2A and 2B.

19 The above evaluation process shows Option 2A as the highest scoring option. Further evaluation detail is articulated both in the body of the report below and the attached business case including sensitivity analysis.

Costs and Funding

20 The 2018 Long Term Plan has a capital budget estimate of \$14.7 million for the scheme.

21 The following table summarises the latest cost estimates for the four options:

Option	Capital cost (08/18)	Operational cost (08/18)
1. Consented CPI	\$17.6 million	\$356,056
2a. CPI + Base flow MF	\$20.1 million	\$465,949
2b. CPI + Full flow MF	\$20.8 million	\$487,780
3. SDI + Full flow MF	\$22.2 million	\$488,729

22 Appendix 9 of the business case details the main reasons for the changes in the project estimates. These include for example, additional buffer storage at the Te Anau treatment plant and a decision to use a more resilient high-density polyethylene (PE) material.

23 The costs identified for Option 3 do not allow for the writing off and/or funding of the costs associated with development of the CPI options, which have been capitalised to date. To the end of August 2018 these total \$2.4 million. Should Council make a decision to proceed with Option 3 then these costs will need to be transferred to the Statement of Comprehensive Revenue and Expense. This transfer would have a direct effect on the surplus of Council for the year it occurs. The costs associated with development of the SDI Basis of Design Report have been expensed to date.

24 Following a significant period of liaison with the Ministry of Business Innovation and Employment (MBIE), Council has recently had approved a grant towards the cost of the project from the Tourism Infrastructure Fund (TIF). The approval of this funding reflects the fact that the scheme has been designed to accommodate capacity significantly larger than would have been required had the project been servicing only the local community. Subject to agreement of appropriate contract conditions, Council will receive a \$5 million contribution from central government. This contribution is not tagged to, or contingent on, any particular discharge method.

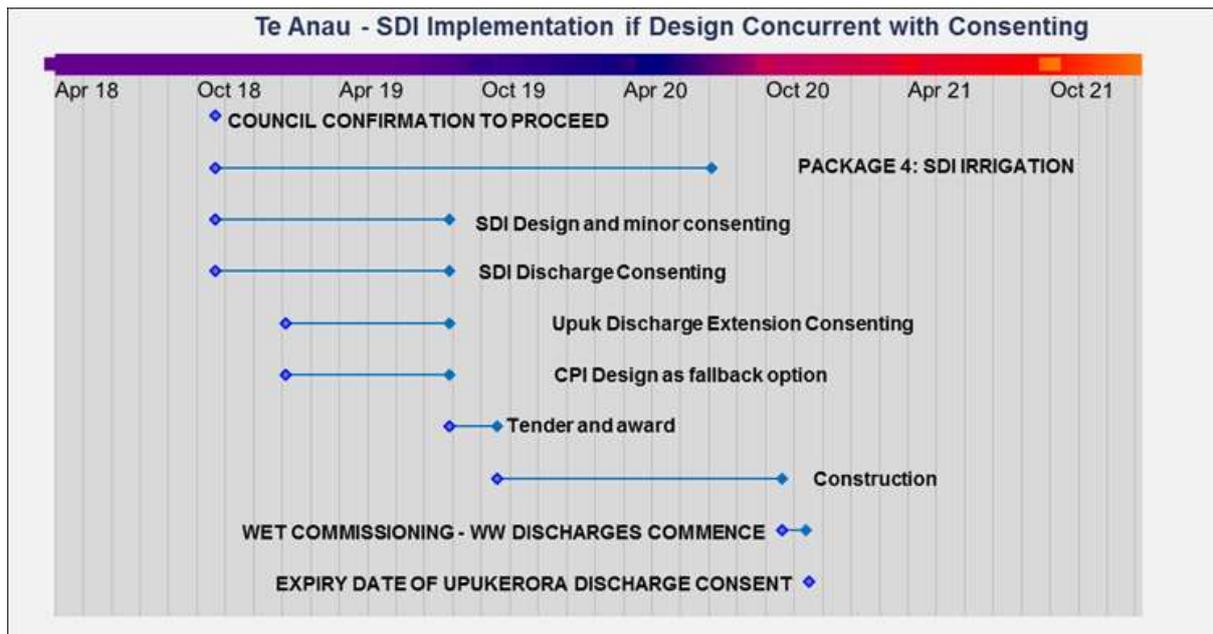
25 Wastewater is currently funded via a district wide rate. As part of its December 2017 decision, Council asked for advice on the options that might exist for funding the difference in costs between Option 1 and Option 3, should the Council decide to pursue this option. The following table provides a summary of the different funding options (all GST exclusive):

Year	2018 /19	2019 /20	2020 /21	2021 /22	2022 /23	2023 /24	2024 /25	2025 /26	2026 /27	2027 /28
Amount to be added to the existing Te Anau Community Board rate if all additional rates are collected through it										
Te Anau Community Board	\$-	\$-	\$-	\$94	\$141	\$136	\$130	\$132	\$134	\$136
Amount to be added to the existing Te Anau Community Board and Manapouri Community Development Area rate if all additional rates are collected through them										
Te Anau Community Board	\$-	\$-	\$-	\$84	\$126	\$121	\$116	\$117	\$119	\$121
Manapouri CDA	\$-	\$-	\$-	\$84	\$126	\$121	\$116	\$117	\$119	\$121
New rate applied per wastewater connection in the current Te Anau Community Board rate area										
New rate - Te Anau	\$-	\$-	\$-	\$73	\$109	\$105	\$100	\$102	\$103	\$105
New rate applied per wastewater connection in the current Te Anau Community Board and Manapouri Community Development rating area										
New rate - Te Anau CB and Manapouri CDA	\$-	\$-	\$-	\$65	\$98	\$94	\$90	\$91	\$93	\$94

Project timelines

- 26 At its meeting on 16 November 2016 Council previously resolved ‘*Council agree that it is unacceptable for the Council not to have a consented discharge for the Te Anau Wastewater Scheme*’.
- 27 The timelines associated with the development and implementation of Option 2A (refer section 4.6 of the business case) show that it can be implemented by 30 November 2020 if approval is given to proceed now.
- 28 If Council resolves to pursue Option 3 it will be important that it continue to ‘hold’ the CPI option as a ‘backstop’ should there be any delays with the consenting and/or design/implementation of the SDI option. As above, September 2019 has been identified as a critical milestone for SDI and Upukerora consenting approval. This timeline would ensure the development of an SDI system accommodates a December 2021 operational date (assuming the Upukerora consent extension is successful).
- 29 Any SDI consenting process would need to be run concurrently with the Upukerora consent extension and the SDI design process. Should the SDI or Upukerora extension consenting processes become protracted and at risk of missing the September 2019 deadline then Council

would need to make a decision to default back to a CPI option. In order to maintain CPI as a default option there would also need to be a degree of CPI design undertaken concurrently with SDI design and consenting to ensure this default option is able to continue to meet required timelines (completion by November 2020). Further risk is evident in relation to the SDI detailed design being completed concurrently with the SDI consenting process. This could lead to SDI design requiring revision following consent conditions being finalised. If either of these risks eventuated there will be further 'sunk' costs that would need to be 'written off'. The following table provides further clarity around these timelines:



Conclusion

- 30 Following the completion of the SDI Basis of Design and costing development process, the CPI design inputs and costings have been reviewed and updated to ensure a 'like-for-like' comparison to the extent that this is possible.
- 31 As a result of the further work completed **Option 2A – Wastewater oxidation pond, base load membrane filter, trickling filter and centre pivot irrigation, \$20.1 million** has emerged from the evaluation process as the highest scoring and therefore recommended option.
- 32 This is further supported by the following additional considerations:
- Additional cost and risk for SDI and Upukerora resource consent extension (~\$150,000)
 - The write-off of the costs of developing CPI (~\$2.4 million)
 - The additional programme risk associated with SDI, including the potential sunk costs should consents prove difficult to attain (~\$425,000)
 - The statutory requirements for financial prudence and to pursue the most cost-effective option.
- 33 On the basis of the recommended option identified in the updated business case, the summary findings of the independent peer review and the additional considerations identified above, staff support the recommendation to proceed with Option 2A.

Attachments to Report

The following attachments are included with this report.

Attachment A - Te Anau Wastewater Scheme – Kepler Block business case.

Attachment B - Te Anau Treated Wastewater Scheme Basis of Design – Note this report includes as appendices feedback from Ecogent Limited as Commentator (Appendix G) and also from Mainline Aqua as Peer Reviewer (Appendix H).

Attachment C – Advice around additional storage requirements from Stantec and Aqualinc.

Attachment D - Wildlife Management Report - Avisure Limited.

Attachment E - Legal Opinion around various matters related to the Kepler Project – Anderson Lloyd Ltd.

Recommendation

That the Te Anau Wastewater Discharge Project Committee:

- a) Receives **the report titled "Business Case - Te Anau Wastewater Discharge Method - Kepler Block" dated 3 October 2018.**
- b) Determines that this matter or decision be recognised as significant in terms of Section 76 of the Local Government Act 2002.
- c) Determines that it has complied with the decision-making provisions of the Local Government Act 2002 to the extent necessary in relation to this decision; and in accordance with Section 79 of the Act determines that:
 - i) The options outlined in the business case are the reasonably practicable options available.
- d) Determines that in making this decision it has had regard to:
 - i) The purpose of local government as defined in section 10 of the Local Government Act 2002 and in particular the need to meet the needs of its communities in the most cost-effective manner now and into the future
 - ii) The principles in section 14 of the Local Government Act 2002 including in particular the need to take account of the diversity of its communities and the range of views held by those communities and the need to take a sustainable development approach
 - iii) The need to be conscious of the financial impact that this project will have on Councils current system of rating levels **and Council's overall financial position**
 - iv) The need to have an alternative discharge option consented and operational before the expiry of the current consented discharge to the Upukerora River in December 2020 and that the timeframes within which the design and construction of a new discharge scheme needs to be completed is now limited.
 - v) The previous Council decision (Item 8.8 16 November 2016) that it is unacceptable for Council to not have a consented discharge for the Te Anau Wastewater Scheme.
- e) Notes the requirement for Council to manage its financial arrangements in a prudent manner and make effective provision for the funding of all of its activities in a way that is financially affordable and sustainable for its communities which suggests that it should adopt the most cost effective option.
- f) Notes that the capital costs of the four options outlined in the Te Anau Wastewater Scheme – Kepler Block business case have increased since the last business case was presented in December 2017 and that the cost of the different options now range between \$17.6M (Option 1 – Centre Pivot Irrigation) and \$22.2M (Option 3 – Slow Rate Drip Irrigation).
- g) Notes that Council has received notification that it will receive, subject to finalisation of appropriate contract conditions, a contribution of \$5M from the Tourism Infrastructure Fund towards the cost of implementing the Te Anau Wastewater Scheme and that this allocation is not conditional on a particular discharge method.

- h) Notes that the financial analysis included at section 5.3 of the business case suggests that rates are at or nearing what is recognised as an affordability threshold for a number of communities in the Southland district and that as a result Council should be cautious about pursuing options which increase rates above other viable options
- i) Notes the importance of completing construction of the Te Anau Wastewater Discharge Project upgrade before 30 November 2020 and that the timeframes within which this work must be completed are now tight
- j) Recommends to Council, given the outcome of the option evaluation process, that it approve the updated final business case (Attachment A) and proceed with the implementation of Option 2A – wastewater oxidation pond, base load membrane filter, trickling filter and centre pivot irrigation.
- k) Notes that Council will need to record, in accordance with Section 80 of the Local Government Act 2002, that its decision to approve Option 2A is inconsistent with the 2018-2028 Long Term Plan on the basis of the significant cost escalations.

Background

- 34 At its meeting on 13 December 2017 Council considered a business case which provided an assessment of the reasonably practicable options available for the development of a new Te Anau wastewater discharge system. This followed on from the earlier consideration of this business case by the Services and Assets, Finance and Audit and Te Anau Wastewater Discharge Project Committees.
- 35 As a result of its deliberations the Council made the following decisions:
- a) **Receives the report titled "Final Business Case - Te Anau Wastewater Discharge Method - Kepler Block" dated 4 December 2017.**
 - b) Determines that this matter or decision be recognised as significant in terms of Section 76 of the Local Government Act 2002.
 - c) Determines that it has complied with the decision-making provisions of the Local Government Act 2002 to the extent necessary in relation to this decision; and in accordance with Section 79 of the Act determines that:
 - i) It believes that the options outlined in the business case are the reasonably practicable options available.

- d) Determines that in making this decision it has had regard to:
- i) The principles in section 14 of the Local Government Act 2002 including in particular the need to take account of the diversity of its communities and the range of views held by those communities and the need to take a sustainable development approach
 - ii) The need to be conscious of the financial impact that this project will have on its wastewater **targeted rates and Council's overall financial position**
 - iii) The need to have an alternative discharge option consented and operational before the expiry of the current consented discharge to the Upukerora River in December 2020 and that the timeframes within which the design and construction of a new discharge scheme needs to be completed is now limited.
- e) Notes the requirement to manage its financial arrangements in a prudent manner and make effective provision for the capital and operating costs associated with the Te Anau Wastewater Scheme Project
- f) Notes that the capital costs of the three options outlined in the Te Anau Wastewater Scheme – Kepler Block business case range between \$14.5 million (Option 1 – Centre Pivot Irrigation) and \$21.8 million (Option 3 – Slow Rate Drip Irrigation).
- g) Notes that the financial analysis included at section 5.3 of the business case suggests that rates are at or nearing what is recognised as an affordability threshold for a number of communities in the Southland district
- h) Notes that proceeding with Option 1 is expected to see the district wastewater rate increase by some 47% (to \$571 excl GST or \$656 incl GST in 2028/29) over the next 10 years while proceeding with Option 3 will see the district wastewater rate increase by approximately 63% (to \$635 excl GST of \$731 including GST in 2028/29) over the next 10 years.
- i) Notes that there are a number within the community who would like to see Council proceed with the implementation of Option 3 - Slow Rate Drip Irrigation and that the Te Anau Wastewater Project Committee has resolved it strongly prefers this option.
- j) Notes that due to Option 3 not being the preferred option identified from the multi-criteria analysis and that it breaches some of the investment objectives and constraints previously approved by Council that Option 3 has not been scoped and/or costed to the same level of detail as the other options included in the business case.
- k) Instructs the Chief Executive to further scope and develop more detailed cost estimates for Option 3 – Slow Rate Drip Irrigation and revise the Te Anau Wastewater Scheme – Kepler Block business case to include this information.
- l) Instructs the Chief Executive to provide, in further developing Option 3 to enable it to be considered by Council, advice on:
- i) The process and estimated timeframes that would need to be followed to obtain a decision on the resource consent and any other approvals that might be required to proceed with the implementation of Option 3
 - ii) The financial implications and relative costs and benefits of proceeding with Option 3 and whether these represent financially prudent spending given the

financial management requirements that Council has under the Local Government Act 2002

- iii) The decision-making process that the Council would need to follow, given the decision-making provisions of the Local Government Act 2002, if it were to form the view that it was desirable to proceed with the implementation of Option 3
 - iv) The alternative options which might exist for funding the increased costs of Option 3, relative to Option 1, including the possibility of a portion of the increased cost being funded by way of a rate on the Te Anau and Manapouri communities
 - v) Any other risks associated with Option 3, including potentially financial, timing or environmental
 - vi) The timeframes that would be associated with proceeding with the further development and implementation of Option 3 should the Council make a decision to approve it.
- m) Determines that despite asking for further advice to be developed on the merits of Option 3, that it needs to proceed with the implementation of the consented option, being Option 1, including the development of the detailed design for a pipeline for transporting treated wastewater from the Te Anau Wastewater Treatment Plant to the Kepler Block, until such time as it is in a position to make a final decision as to the final method of disposal.
- n) Instructs the Chief Executive to proceed with the steps needed to advance the implementation of the business case including the development of the detailed design for the construction of a treated wastewater reticulation system from the Te Anau Wastewater Treatment Plant to the Kepler Block with such design to allow for a disposal method via any of the three discharge options included in the Te Anau Wastewater Scheme – Kepler Block business case.
- o) Subject to making a final decision at a future meeting as to its preferred method of final discharge Council approves the business case.

36 The practical effect of the above decisions can be summarised as:

- Council approved the development of a new wastewater disposal system at the Kepler Block and instructed staff to take the necessary steps to proceed with aspects of implementation unrelated to the discharge method, within the scope of the business case as presented at that time.
- Council is still to make a decision on the final method of discharge to be used and in particular whether this will be by way of centre pivot irrigation or sub-surface drip irrigation. This issue is the primary focus of this latest business case which is included as Attachment A.
- Staff were asked to develop advice covering the range of issues that the Council will need to consider in making its final decision on the disposal method. This advice will cover, amongst other issues, the implications of a change in disposal method on the scope of the project, the requirement to have a new disposal system operational before the existing discharge consent expires in December 2020, the resource consenting requirements for development of a new disposal system and the likely impact of such a decision on project costs and risks.

37 It is considered that each of the resolutions identified above from Councils meeting on 13 December 2017 have been addressed in this report.

Subsequent Work

38 Following the decisions made at the Council meeting of 13 December, work has been progressed on a number of deliverables associated with the project. Of these, the two most notable elements are the detailed design work on the pipeline and the development of a Basis of Design report for the SDI option.

39 The pipeline work is now progressing towards final detailed design and tender documentation. This work has progressed to a relatively advanced state on the basis that the elements of design are the same for each of the two options that could be implemented at Kepler.

40 The other critical piece of work has been the design for the SDI system so that a robust comparison could be made with CPI.

Basis of Design – SDI and CPI

41 The purpose of developing the Basis of Design Report (Attachment B) was to identify the requirements for an SDI discharge system to the same level of understanding as a CPI discharge. This is important to enable a 'like-for-like' comparison of the relative costs and merits of each. It is important to note that as part of this process further assessment of the CPI design parameters was undertaken where necessary to ensure parity of design inputs across the two systems.

42 The Basis of Design Report was developed collaboratively with comment from Ecogent Limited being considered and Mainline Aqua fulfilling a formal peer review role. A number of the comments offered by Ecogent have been incorporated into the final design document.

43 There are a number of areas where full agreement was not reached. These are outlined in the Basis of Design Report with commentary attached from Ecogent, Stantec and Mainline Aqua.

44 Through this process the area required for SDI was agreed as well as an optimum layout for fields and sub fields. The report has identified an area of 55 hectares as required for SDI in comparison to approximately 70 hectares for CPI, with the main reasons for the reduced area being the efficiency of SDI and the increased nitrogen reduction through the membrane filtration plant that all parties agreed was an essential process element upfront of any SDI field.

Role of Ecogent Limited and Mainline Aqua Limited

45 Ecogent Limited were invited to participate in the process of developing the SDI Basis of Design Report given their experience in this area and the work that they have done with FSO.

46 Council engaged Mainline Aqua to undertake a formal peer review of the work being completed and to ensure that the SDI design was robust and completed to an appropriate level of development to enable a like-for-like comparison with CPI. Ben Stratford, the principal at Mainline Aqua, has extensive experience with the design, installation and operation of SDI systems including the scheme at Pauanui.

47 While the process originally intended to develop a concept design for SDI the reviewer notes that the design developed further as an assessment of the relative merits of SDI versus CPI largely on the basis of comments provided by Ecogent Limited.

48 While there was general consensus between the parties on a number of specific process elements there was still some disagreement on a number of issues such as pipeline diameter.

- 49 The peer review report considers some of the main points of contention (especially those that may have a marked effect on overall cost) and provides additional clarification. Overall the review indicates that the site is appropriate for irrigation by CPI or SDI and that any limitation of the land is likely to be applicable to either.
- 50 In summary, the opinion of the peer reviewer is that the design basis report and cost estimates have been sufficiently and robustly developed and are in sufficient detail to allow a like-for-like comparison between CPI and SDI. In this regard the peer reviewer noted:

“It is my opinion that the design basis report and cost estimates have been sufficiently challenged over the last several months to offer SDC a reasonable comparison between CPI and SDI systems for considerations in the business case review.”

- 51 The peer reviewer also provided a comparison of the benefits and risks associated with both CPI and SDI. It is noted that this review is closely aligned to previous advice from peer reviews and other experts.
- 52 Feedback from both Ecogent and Mainline Aqua, as the peer reviewer, is included within appendices G and H of the Basis of Design document attached as Appendix B.

Critical Items of Contention

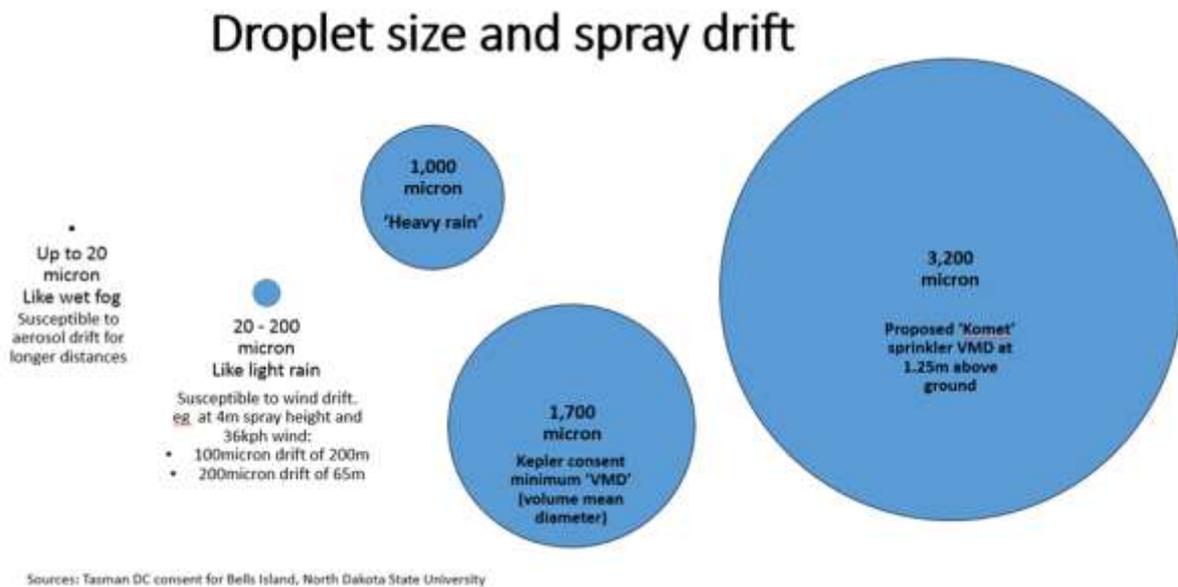
- 53 This section of the report seeks to identify and comment on a list of key points where agreement could not be reached. Staff and the peer reviewer believe that each of these issues has been adequately addressed through the design and/or costings.
- 54 It is noted that through this process no new issues of concern were raised but all had been identified previously largely through the development of resource consent applications and/or through concerns raised by submitters.

Odour

- 55 Odour is recognised as a risk when planning and developing solutions for wastewater treatment upgrades and this is a concern that has been raised by submitters throughout the consenting process. Council has always recognised this as a significant risk and has proposed to mitigate that risk by construction of a biological trickling filter to aerate the treated wastewater at Kepler and thus reduce risk of odour emissions.
- 56 Further odour mitigation measures allowed for in the project include low pressure irrigation utilising large droplet size irrigated close to the ground as discussed in the following section. The provision of carbon filters on air valves along the length of the pipeline will also mitigate risks of emissions particularly during filling and starting up the pipeline. This is an activity that has been assessed as having Permitted Activity Status under the RMA and for which approval has been granted from Environment Southland. Provision of a membrane filter as part of any final solution will help further mitigate any risk.
- 57 It is noted that the risk of odour emissions from an SDI disposal field is much lower. However, there may be a need for some odour control at Kepler to deal with the risk of emissions from the SDI system.
- 58 It is also noted that irrespective of the disposal methodology implemented Council will be required to develop a robust Odour Management Plan (OMP) as part of the resource consent conditions.

Spray Drift/Aerosols

- 59 A point of contention in regard to this concern is the risk of aerosols migrating off site under certain conditions and the potential impact this may have on neighbouring properties.
- 60 It is noted that droplet size is controlled by conditions in the consent, with a consented volume median diameter of 1,700 microns. Evidence from other locations and discharges shows that particles over 200 microns settle quickly even in strong winds. In other words the median droplet size previously proposed is eight times larger and hence is much more likely to settle quickly.
- 61 Utilising the Low Elevation Spray Application (LESA) arrangements further increases droplet size and reduces pressure significantly, further reducing the risk of spray drift and aerosol generation. As a comparative the following figure illustrates the relative difference in droplet diameters between those associated with spray and aerosol and those proposed with a centre pivot irrigation field. Note this is representational and shows the relative difference in size. It is not intended as a demonstration of actual droplet diameter.



- 62 The resource consent further requires that there shall be no drift across site boundaries. Spray sensors will be installed along the southern boundary with a range of options available for management of spray drift. These include establishment of shelter belts, control of droplet size and also reduction in height of irrigation drippers to no more than absolutely necessary above ground level.

Environmental Performance

- 63 The issue of environmental performance of both systems has been raised through the development of the Basis of Design Report with comments made that an SDI system will deliver a better environmental outcome as a result of the requirement for a membrane filter which will remove up to 20% more nitrogen.
- 64 A membrane filter is now proposed as part of the preferred option. Although not required through the consent process a membrane filter included with a CPI irrigation field would deliver a commensurate level of performance.
- 65 Environmental performance is therefore considered commensurate across the consented CPI option and SDI option. SDI design has been based on a smaller discharge area (20% less) based

on its use of membrane filtration. Acceptability of this assumption will need to be confirmed through any consenting process.

- 66 As above, the recommended Option 2A adds membrane filtration for CPI and while not necessary for consenting purposes will improve effluent quality to a similar standard as that discharged through Option 3.

Storage Capacity and Issues from Soil Saturation

- 67 A requirement of the current consent is that an additional 15,000 m³ of storage is provided prior to discharge to Kepler. As the SDI basis of design process has developed there has been considerable debate around whether this is a sufficient volume and whether that figure is equally applicable to SDI.
- 68 As a result, through the development of the basis of design further work was undertaken to understand buffer storage requirements for each irrigation option. The work undertaken by Aqualinc involved an analysis of long term climate records also taking into consideration increasing population and the impact of climate change.
- 69 The investigation report from Aqualinc and Stantec Memo (Attachment C) outlines the size and frequency of buffer storage needs based on analysis and modelling of records dating back to 1960 as well as looking at updated wastewater inflow data to the ponds. The report suggests that storage of approximately 22,000 m³ is a reasonable requirement for an SDI field whereas this would likely increase to approximately 30,000 m³ for CPI. The report further outlines how this could be staged to match future growth and demand. It also provides an opportunity to revisit future storage requirements with actual knowledge of wastewater treatment and irrigation performance, and actual effects of growth and climate change. These volumes have been accounted for in the costings for each option.
- 70 One important point to note is that much of the work and debate associated with the updated business case process centred around a prolonged wet weather event in May 2016. The modelling undertaken has been prefaced on irrigation not being able to be applied for all of that ten day period. As such, this is a conservative position. Given the free draining nature of the soils it is evident that irrigation would have been possible for some of that time.
- 71 The attached photographs were taken on 19 May 2016 which is two days after the ten day period of prolonged wet weather. From these photographs it is clear that there was little or no standing water and the site was suitable for irrigation. Council staff were on site at that time and able to access all areas of the block by vehicle. Further, the depths to groundwater taken from a number of bores around the block at that time would also support this, and suggest that the impact of this event has been overstated.



Kepler Block 19 May 2016

Date	Well 1	Well 2	Well 3	Well 4	Well 5	Well 6	Well 7	Airport	MB3
12/03/2015	12	10.49	6.46	4.51	6.1	8.29	10.94	7.72	17.07
17/08/2015	11.67	10.33	5.86	3.26	5.08	7.54	11.58	6.89	16.9
19/05/2016	12.2	10.7	5.9	3.8	5.9	8.1	11.1	7.9	17.2
29/07/2016	11.6	10.3	5.8	2.9	4.8	7.5	10.4	6.65	16.7

Depth to Groundwater - Kepler 2015/16

72 A further point of contention relates to the Ecogent comment on the ability of SDI to continue irrigating under all conditions even while ponding is occurring on the surface. This point has been considered by the peer reviewer who, in his Basis of Design Peer Review Report, makes the following comment:

“There is a definitive limit to the depth of irrigation that can be applied to the Kepler Block through either SDI or CPI systems and this needs to be considered in conjunction with the balance storage requirements at the treatment plant.

The implication of saturated soils would be the same for both SDI and CPI disposal systems and is a function of the soil properties...”

Wheel Track Management

73 The issue of CPI creating ruts across the irrigation field has been raised as an issue of concern by a number of submitters and was further raised through the Ecogent commentary.

74 The issues around wheel track management are common to CPI operators across the country and as such mitigation measures and costs for tracking or other management steps are well understood and allowed for in the project budget. This point is also touched on in the peer review report.

Bird Strike and Wildlife Management

75 There have been concerns raised over the increased risk of bird strike at the airport that will be created if Council implements a waste water irrigation process on the Kepler Block land. The issue was addressed in a report by MWH (now Stantec) dated March 2013. This report was part of the supporting information for the resource consent application.

76 SDC felt it was important, from an airport operational risk perspective, that a second opinion be obtained. Also since the March 2013 report was produced, the concept of sub-surface irrigation has been mooted. It was considered important to understand the comparative risks of each of the options. The report by Avisure is attached (Attachment C).

77 Avisure are a company that specialises in managing aviation hazards by applying a safety management system approach. They have worked with civil and military operations around the world since 1996 to provide strategies and services that manage aviation risk. Council engaged them to assess the situation at Kepler.

Findings

78 The irrigation site is already highly attractive to birds under the current practice of allowing grass regrowth and then grazing to very short grass along with shelter belts and water ponding around the bog area. If mitigation is not applied, this attraction could be exacerbated by the introduction of nutrient rich treated wastewater, which will flush invertebrates to the surface for food.

79 The Avisure Report recommends that the proposal to irrigate wastewater and produce silage only proceeds in this location if a comprehensive management plan is developed. This plan would need to detail the mitigation required to manage the risk with regular monitoring and evaluation.

80 The Avisure Report indicates that an appropriate management plan would reduce the risk to such an extent that enables the adoption of either a centre pivot irrigation system or a sub-surface drip irrigation system. It is critical that risks are regularly monitored and reviewed and, if necessary, corrective actions taken to ensure the risk is maintained to acceptable levels.

81 Avisure's assessment indicates that the pivot irrigation system is likely to be slightly more attractive to birds than sub-surface irrigation which would be less likely to saturate the soil.

82 Some of the mitigation measures proposed by Avisure for the site include the adoption of a long grass policy, infilling existing depressions and dispersing roosting birds. If applied well, the report asserts that mitigation could significantly reduce the risk currently created by the site.

Maintenance Considerations

83 Operational and maintenance costs are outlined in the business case with the main differences between the options being largely due to increased power requirements associated with the operation of the membrane filter that is common to Options 2(A and B) and Option 3.

84 From the business case it is further noted that Option 1 is significantly lower than Options 2 and 3 with a difference of approximately \$23K between the highest scoring Option 2A and Option 3.

85 When considering maintenance requirements it is also worth noting comments from the peer reviewer that with a CPI option all significant infrastructure is above ground and therefore easier to undertake both planned and reactive maintenance.

Frost Impact

86 This issue has been raised through both the consent hearings process and the basis of design and peer review and commentary. The main concerns raised are around the risk of treated wastewater freezing in the pipework of the irrigators with the potential to cause damage.

87 The risks associated with frost damage is well understood with mitigation measures including trace heating of irrigation lines relatively commonplace across the country. Such specifics will be considered during the finalised detail design with costs allowed for and managed within current budget forecast.

Financial Considerations

88 A wider financial assessment including costs and impact on rates is considered later in this report. At this stage the following comments are made in relation to the Basis of Design Report.

89 Ecogent have indicated that they believe that there could be the opportunity to reduce the costs of a SDI system. It is noted, however, that both CPI and SDI have been robustly and conservatively reviewed for cost and risk to facilitate a reasonable comparison.

90 Any opportunity to reduce costs associated with SDI can equally be applied to CPI. However, it is important to ensure any design is robust and fit for purpose and that costs are not reduced for one option to bring it into line with the other. This runs the risk of compromising the long term operability and maintainability of the option.

91 The comments of the peer reviewer are again noted that he is satisfied that each option has been robustly assessed and costed to allow a like-for-like comparison of both costings and capability.

Pipeline Sizing

92 Through the development of the basis of design, Ecogent have continually commented that the pipeline sizing requirements for SDI disposal could differ from that required for CPI disposal and as result considerable savings could be made through a smaller diameter pipeline.

93 A significant amount of work has been undertaken to understand the optimum pipeline sizing especially when considering the potential trade-offs between minimising retention time to mitigate odour risk and ensuring that there is sufficient capacity to cater for longer term future flows.

94 Other matters that require consideration include maintaining sufficient velocity within the pipeline to transport air and sediment along the pipeline, length of the pipeline and reasonable power input at the pump station.

95 Through the development of the Basis of Design Report, Stantec calculated the optimum diameter to be 300 mm diameter pipeline and that any reduction in diameter could introduce complications that would affect the operability of the pipeline for either SDI or CPI. These include increased friction losses from a smaller diameter pipeline having a direct impact on power and pumping requirements which may in turn require a higher pressure rating for the pipe.

- 96 The matter of pipeline diameter was also considered by Mainline Aqua through their peer review which concluded:

“For comparative purposes between CDI and SDI there is no reasonable explanation to change the pipe diameter for either option”.

- 97 While this section notes and summarises the main points of contention it is also noted that a number of the suggestions and comments provided by Ecogent were recognised as valid by both Stantec and Mainline Aqua. Of particular note are comments provided around the proposed SDI field layout which were incorporated into the overall basis of design as it was developed.
- 98 The Basis of Design report recognises that both CPI and SDI disposal are valid methods that can be used for the disposal of treated wastewater however it is also noted that there are potential risks and benefits associated with each one.

Discharge Method Summary

Centre Pivot Irrigation (CPI)

- 99 Centre Pivot Irrigation is an established technology that is extensively used to help irrigate large areas in an economic manner. A number of large scale systems have been established around the country as a means of irrigating treated wastewater from community wastewater schemes. Notable examples include Rolleston, Rakaia and Taupo (each similar or larger volume systems).
- 100 Although well established, systems are constantly being upgraded to improve efficiency and reduce impact. Initially centre pivot first used high pressure impact sprinklers mounted at high level. These sprinklers needed between 45-80 psi to operate efficiently with an irrigation application efficiency of around 60%. High pressure irrigators also had a higher risk of aerosol generation and irrigation losses through spray drift off site.
- 101 Recent advances to improve efficiency have resulted in the development of irrigators capable of operating at much lower pressure which also enable the water to be irrigated at a much lower level and larger droplet size thereby significantly reducing risks of aerosol generation and off site spray drift.
- 102 The technology known as Low Elevation Spray Application (LESA) is a modification that delivers water application very close to the soil surface. As it runs at a much lower pressure (typically less than 15psi) it also requires much less energy to operate. Utilising a uniform distribution allows more time for the water to infiltrate into the soil thus reducing any impact from potential post irrigation ponding.
- 103 It is proposed that this technology is utilised if centre pivots are installed at Kepler. A typical LESA installation is shown in the following photograph where the proximity of discharge to ground level is noted:



104 The peer review by Mainline Aqua also touched on benefits and risks associated with CPI. It is noted that this is similar to advice from previous peer reviewers and other experts. Such benefits include:

- Reasonably cost-effective capital investment per hectare to irrigate large areas.
- Variable application rates through speed or rotation, sprinkler selection and variable rate irrigation options that can target or avoid specific locations.
- Sprinkler technology assist with reducing aerosols and spray.
- Above ground infrastructure is easy to service and maintain.
- Minimal below ground infrastructure allows cropping activities such as ripping, aeration and cultivation to be undertaken with limited risk.

105 Likewise key risks identified as requiring management include:

- Risks associated with ponding including inability to irrigate on some or all of the block during extended periods of high-rainfall.
- Need for ongoing maintenance of irrigator tracks.
- Risk of spray drift.
- Exposure to frost.

Subsurface Drip Irrigation (SDI)

106 Subsurface Drip Irrigation is also considered an appropriate methodology for the disposal of treated wastewater. It is used extensively on a much smaller scale as a means of irrigating treated wastewater from onsite wastewater treatment systems such as multi stage septic tanks. A number of larger schemes have been installed serving community wastewater schemes for example those at Omaha, Pauanui and more locally at the aluminium smelter at Tiwai Point. It is noted that the use of SDI proposed would be on a larger scale, in terms of the area of discharge, than any of these schemes currently operating.

- 107 An SDI system is a pressurised distribution system that can deliver small precise doses of treated wastewater to relatively shallow disposal lines. Lines must be within the root zone to enable nutrient uptake by pasture. SDI drip lines have small inline emitters that discharge effluent at slow controlled rates and is usually installed by mole ploughing. The drip lines are also impregnated with a root growth inhibitor to prevent root intrusion through the emitters. A typical photograph of a SDI install is included below:



- 108 The photograph on the left shows the installation of the main feed and flush main by traditional open trenching with the drip lines connected to the feed main. The drip lines themselves are then mole ploughed into the ground at a much shallower depth as per the right hand photograph.
- 109 The Mainline Aqua peer review provided further commentary on some of the key benefits associated with SDI. These include:
- Flexibility in dosing arrangement allows irrigation fields to be optimised.
 - No surface discharge removes risk of aerosol formation.
 - SDI is at the higher end of irrigation option for efficient water use.
 - Discharge of effluent to root zone can extend period irrigation during rainfall events.
 - Reduced exposure to frost conditions.
- 110 Likewise the reviewer also identified a number of risks associated with SDI, all of which have been previously identified. These include:
- Below ground infrastructure is not easy to service and upgrade.
 - Physical cropping such as ripping aeration and cultivation need to be carefully considered or not undertaken above SDI infrastructure. It is important to note this in the context of the planned cut and carry regime to manage nitrogen across the block.
 - Small diameter drippers can become blocked through root intrusion or algae reducing application ability.
 - Care must be taken during installation to ensure that the drip lines are laid at a shallow enough depth to allow nutrient uptake but still have a high amount of protection against damage to drip lines for example by buried stones when the lines are ploughed in, or by vehicle movements on the fields post installation.

- 111 It is understood that none of the other SDI schemes across New Zealand manage pasture production by cut and carry (certainly not to the same scale as that required at Kepler). The ability of the scheme, in particular given the significant length of shallow drip line, to withstand the impact of heavy agricultural cutting and baling plant and machinery must also be considered.

Membrane Filtration in Wastewater Treatment

- 112 While the use of membrane filtration (MF) as a means of wastewater treatment has been established for some time it is a relatively recent development for installation after the oxidation pond outlet. Of those plants installed in 2017 and 2018, Council staff are aware that issues with effluent quality are causing performance issues resulting in plants being unable to meet design flow due to increased fouling of membranes.
- 113 Should similar issues arise for Te Anau, solutions may require expenditure on components such as additional process elements, or further membrane modules. Changes to control logic or 'clean in place' (CIP) chemicals may also be required, and have been accounted for as a contingency.
- 114 The lessons for MF for Te Anau can only be general, and the other plants have not been operating long enough for their long-term performance to be clear. It will be essential to collect raw water quality data (eg, on algae levels) over the seasonal range, to inform the design. There is the opportunity to learn more from other MF installations over the next year, and this will inform whether the detailed design for Te Anau needs to be more conservative.
- 115 The risks for CPI and SDI options are significantly different and SDI is more at risk if there are problems with the MF. For CPI, MF is optional both in treatment and consenting. Reduced throughput through the MF plant, while undesirable, can be compensated by a bypass facility. This will not affect consent compliance or long term operation. For SDI, it is essential and dependent on all flow passing through the MF plant to remove algae, this is to avoid fouling of the subsurface irrigation field.
- 116 If MF fouling was to reduce the peak flow capability then this would need to be addressed to avoid the risk of overflow at the ponds. While the likelihood of fouling occurring is the same for both CPI and SDI it should be noted that the consequences for an SDI system are significantly greater. This is an important point that has weighed heavily in association with the recommendation.

Evaluation Process

- 117 As indicated through the previous reports a representative group from Council and Stantec New Zealand developed a number of evaluation criteria based on Environmental, Cultural, Social and Economic Values. Weightings for each criteria were then agreed and options scored.
- 118 Initially, the options were scored by each panel member prior to a group arbitration exercise where collective agreement was reached on each score. Following on from the development of the Basis of Design Report these options were reviewed, updated and rescored by the original panel members following the same protocol as previously.
- 119 It is important to reiterate that the only options considered were those that were believed to be reasonably practicable and capable of meeting a minimum standard as agreed by the panel. As a consequence these are based around further treatment and disposal to the Kepler Block given that this is the only site that is consented for the discharge of treated wastewater.
- 120 The four options considered at Kepler are outlined within the business case document which is included as Attachment A and can be broadly summarised as:

- Option 1 - Consented Option - pipeline to Kepler with irrigation via centre pivot with provision of land treatment via nutrient uptake through pasture and bacteria die off from both UV radiation from natural sunlight and also as treated wastewater passes through the soil. Additionally, odour risk would be controlled by a trickling filter.
- Option 2A - this is essentially similar to Option 1 with addition of a membrane filter at the oxidation ponds to treat flows up to 2,200 m³. This would provide additional treatment for the majority of occasions.
- Option 2B - This is essentially the same as Option 1 but with a membrane filter sized to treat flows to the consented peak of 4,500 m³.
- Option 3 - This is similar to Option 2B with membrane treatment up to peak flow of 4,500 m³ but with further land based treatment through sub surface drip irrigation rather than centre pivot irrigation. Further filtration will also be required at the Kepler site to deal with any solids material generated within the pipeline.

121 A further option to install a membrane filter to treat base flows of up to 2,200 m³/day prior to SDI at Kepler was considered but discounted as it was considered to carry too much of a risk of causing damage to the SDI field.

122 A further action common to each option considered is the decommissioning of the current wetlands and outfall pipe and the provision of additional storage at the pond site as required by the resource consent. It is also noted that each option involves the construction of additional storage at the oxidation ponds.

123 The following table helps illustrate the individual components of each of the four options:

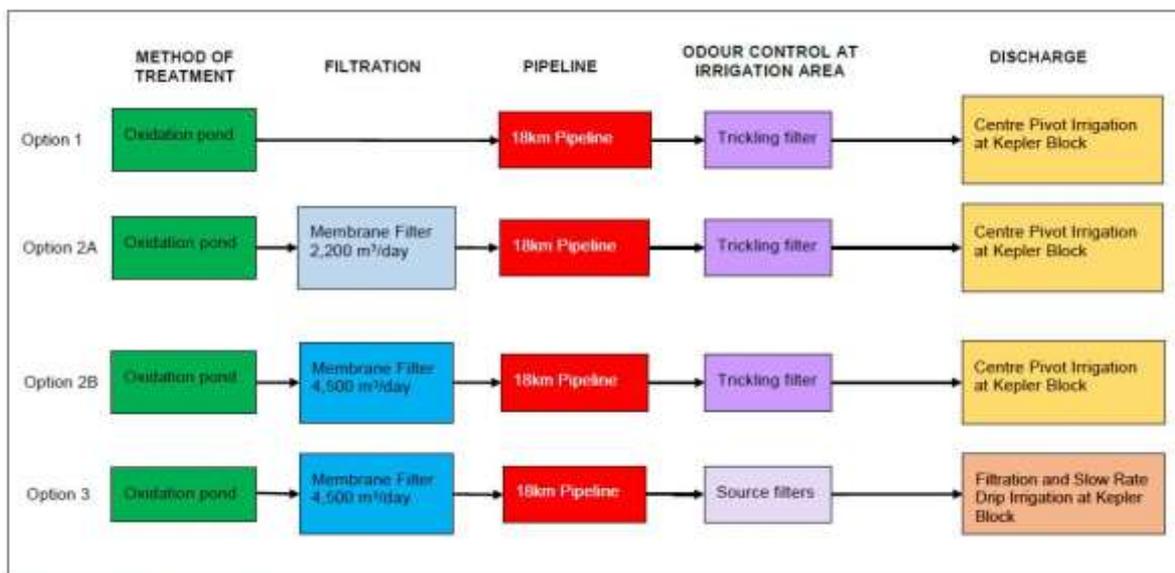


Figure 7: Schematic of Options Assessed

124 Following completion of the scoring evaluation exercise Option 2A emerged as the highest scoring option, with Option 1 and Option 2B scoring relatively closely in second and third (refer evaluation Table 1 in executive summary).

- 125 This revised scoring represents a different outcome to the previous evaluation exercise which identified Option 1 as the preferred option. The changes in the scoring are solely as a result of a more detailed CAPEX assessment particularly around the membrane filtration costs.
- 126 While it is noted that Option 2A is the highest scoring option it includes incurring additional construction costs of \$2.1 million or overall project costs of \$2.5 million over Option 1 which still remains a viable consideration.
- 127 In order to test the robustness of the criteria and weighting factors a sensitivity analysis was completed based on two significant adjustments being:
- Assessing the relative scoring assuming that the Kepler consents have not yet been applied for. This adjustment provided a more relevant design and costing comparison between SDI and CPI ensuring the consenting requirement was not unfairly detrimental to SDI. This analysis shows that this assumption will not change the overall ranking of Option 3.
 - Adjusting the weighting of the Key Values. The reason for testing this scenario was to check whether the weightings agreed by the Representative Group made any significant difference to the outcome.
- 128 The following table summarises the base score and also revised scoring following the sensitivity analysis as outlined.

Key Values	Total Score			
	Option 1	Option 2A	Option 2B	Option 3
Base Assumptions	6.34	6.53	6.33	6.01
Change 1: Kepler consents not applied for	6.02	6.47	6.27	6.01
Change 2: Alter weighting of Key Values to 25% each	6.38	6.75	6.60	6.60
Both changes together	6.23	6.80	6.65	6.60

- 129 As can be seen from the table above, when subjected to sensitivity analysis Option 2A remains the highest ranking option for all of the scenarios.

Factors to Consider

Legal and Statutory Requirements

- 130 Two main pieces of legislation that require consideration are the Resource Management Act 1992 (RMA) and the Local Government Act 2002. Specific legal advice on the RMA implications has been obtained. This is included within Attachment E and is summarised below.

Resource Management Act 1992

- 131 The existing consent for the Kepler Block allows for CPI to be established without a requirement for membrane filtration. This consent will lapse on 22 December 2021, if Council is not able to show that it has given effect to the consent before this date or is able to have it extended.

- 132 The existing discharge consent to the Upukerora River adjacent to the settlement ponds expires on 30 November 2020. The legal advice that Council has received is that it has a reasonable chance of having the term of this consent extended through to 22 December 2021, to coincide with the lapse date for the Kepler consent but a ‘low chance’ of extension beyond that date given recent changes to the regulatory environment.
- 133 Discharge by SDI method would require a new resource consent as outlined in the legal advice. Provided Council were successful with having the current Upukerora discharge consent extended to December 2021, it is anticipated that an SDI discharge system could be designed and constructed within this extended timeframe. However, this would require a ‘straight forward’ consenting process with consent ideally being issued by September 2019.
- 134 The legal advice further outlines the statutory timeframes for processing the application, however it is noted that these could be extended should Environment Southland require additional information to allow any new application to be processed.
- 135 It is also worth noting the comment from legal counsel that the cost of a new application or variation to the Kepler consent is likely to be of a similar order of magnitude to the costs for the original application. While it will be possible to utilise significant parts of the work undertaken in support of the current CPI consent, there does remain a risk that costs will increase beyond the \$300,000 currently budgeted for an SDI consent.
- 136 Of further note is the advice around extending the Upukerora discharge consent which will be necessary while a design, tender and construction of the SDI field is undertaken. This application would be considered under the current operative plan as well as the new Proposed Southland Water and Land Plan. This means that it will be assessed as a non-complying activity given that it is for a continuation of a discharge to water which is contrary to a number of new policies and objectives. As a result it will be required to achieve a much higher threshold for approval to be granted.
- 137 The advice further notes that in light of amendments to the National Policy Statement for Freshwater Management (amended 2017) and the Proposed Southland Water and Land Plan that Environment Southland may well recommend that any application be declined as it is contrary to objectives and policies contained within these statutory instruments. However, it is noted that it is still possible that a short term consent could be granted particularly if it was for a term up until December 2021 which aligns with the date by which the Kepler consent is given effect to.

Local Government Act 2002

- 138 Section 10(1)(b) of the Local Government Act 2002 defines the purpose of local government as including:

to meet the current and future needs of communities for good quality local infrastructure, local public services, and performance of regulatory functions in a way that is most cost-effective...

- 139 Section 10(2) reads:

*In this Act, **good-quality**, in relation to local infrastructure, local public services, and performance of regulatory functions, means infrastructure, services, and performance that are—*

(a) efficient; and

(b) effective; and

(c) appropriate to present and anticipated future circumstances.

- 140 The Section 10 provisions make it clear that Council has a clear responsibility to consider the most cost-effective option (ie the option that meets the identified need at least cost). It could reasonably be argued that this would equate to option 1 given that it is a viable and consented option and has the lowest cost.
- 141 Section 10 does allow, however, some discretion as to what might constitute “*effective and appropriate*”. The evaluation matrix takes account of a wider range of factors to measure these parameters. As a result it would seem reasonable for the Council to conclude that the most cost effective option would equate to the highest scoring option in the evaluation matrix given that this includes consideration of all of the relevant decision-making factors.
- 142 The decision-making provisions of the Local Government Act 2002 apply to the decision as to the discharge method to be used. These provisions are outlined in Part 6 of the Act.
- 143 Section 80 provides that Council is required to record the nature of any inconsistency, reasons for making the decision and whether it intends reviewing the plan/policy concerned when it makes a decision that is significantly inconsistent with any adopted policy or plan required under a statute.
- 144 Section 97 provides that a decision to significantly alter the level of service for a significant activity can only be made if it is explicitly provided for in the local authority’s long term plan. The current consent option (Option 1) is explicitly provided for in the 2018 LTP at a forecasted cost of \$14.7 million. It also notes that Council is reviewing the discharge method.
- 145 While the capital and operating costs for all options have increased, since the 2018 LTP was produced, the flow on implications for local rates are reduced by the TIF funding allocation that has now been confirmed by central government. On this basis staff are of the view that the change does not result in a significant change in the level of service for the wastewater activity provided in the 2018 LTP. Adoption of this net cost to the ratepayer view is supported by the Court of Appeal decision in *Stop the Stadium Inc v Dunedin City Council* (CA269/2009).
- 146 Section 101 of the LGA relates to financial management and requires:
- (1) *A local authority must manage its revenues, expenses, assets, liabilities, investments and general financial dealings prudently and in a manner that promotes the current and future interests of the community.*
 - (2) *A local authority must make adequate and effective provision in its long-term plan and in its annual plan (where applicable) to meet the expenditure needs of the local authority identified in that long-term plan and annual plan....*
- 147 In developing the standard performance indicators, which are included in the financial prudence regulations, the Department of Internal Affairs^[1] commented on the financial prudence requirement in the Local Government Act 2002 as follows:
- “Prudence in a financial context is used to convey a sense of financial restraint, but balanced by a sense of weighing up and consideration of both the present and future implications of financial decisions.*

^[1] Proposed Local Government Financial Prudence Regulations, Regulatory Impact Statement, 24 October 2013

The Department considers three components of financial prudence can be identified for the purposes of these regulations. These are:

- *affordability – if elected members act as trustees for their community, then prudence extends from what is prudent for the local authority, as an organisation, to what is prudent for the community as a whole. This needs to include considerations of what the community can reasonably afford;*
- *sustainability – a local authority should manage its finances in a manner which are sustainable in the long-term. This will include having the financial capacity to deal with unexpected events and external shocks; and*
- *predictability – this requirement is already expressed in the LGA02. Section 102 states that the local authority’s revenue and financing policies are to “provide predictability and certainty about sources and levels of funding.” Lack of predictability suggests weak financial management practices within the local authority concerned, especially where projects or programmes go significantly over budget. This would be an indicator of financial risk to ratepayers and could lead to imprudent outcomes”.*

148 In addition to the above considerations, it is suggested that financial prudence could also be seen as having a ‘prioritisation’ or ‘allocations’ dimension. In this regard, the Council needs to be satisfied that allocating available resources against this particular service or project represents an appropriate use of those funds. In other words does the allocation represent value above and beyond the next highest priority project or initiative that the Council could fund, or is there additional value to be gained from prioritising the allocation differently?

149 The attached business case outlines four different options that each have different financial cost and risk profiles. Given the level of capital expenditure involved (ie between \$17.6 million and \$22.2 million) it is clear that the decision is significant. As such the financial cost of the project and overall affordability are important considerations.

150 Section 5.3 of the business case comments on the overall affordability aspects and notes that rates in a number of communities that pay a wastewater rate are at, or are approaching, the affordability threshold of 5% of household income suggested by the Independent Inquiry into Local Government Rates. In looking at these affordability measures it is also important to recognise that these calculations do not include a number of other pressures on Council rates that are coming through from other projects/priorities that are being reflected in the 2018 Long Term Plan. These include, for example, the need to improve the quality of wastewater and stormwater discharges in other Southland communities that will also be paying for the Te Anau scheme given that wastewater is funded on a district wide basis.

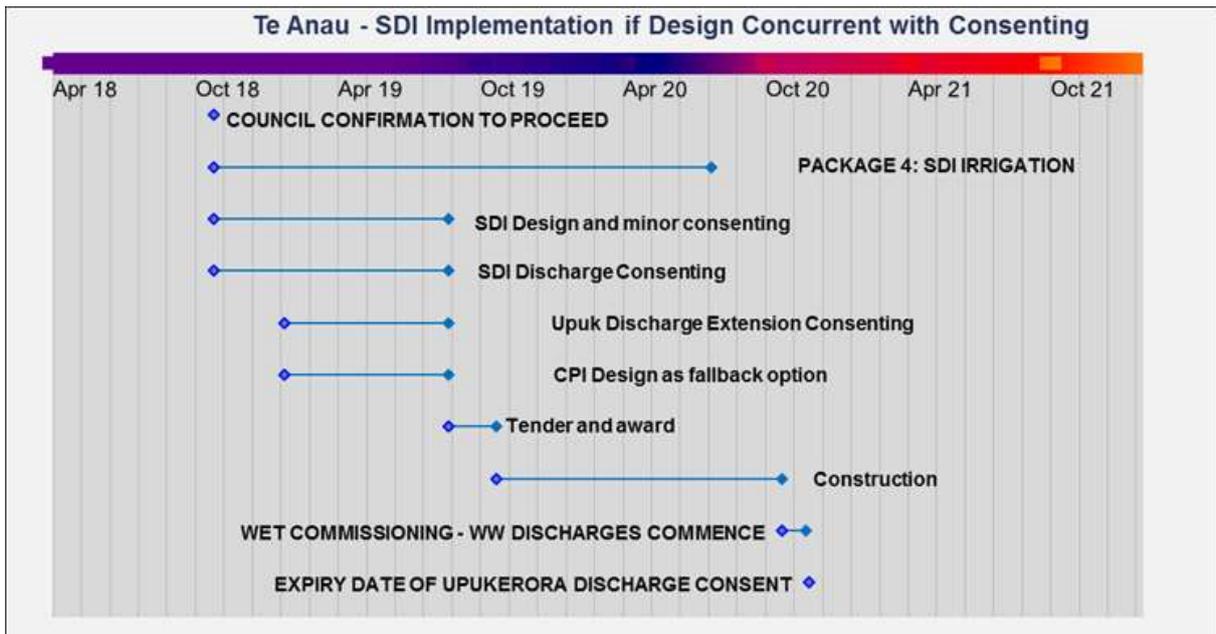
151 Council has, by including a budget of \$14.7 million for this project in the 2018 LTP, come to the view that this level of expenditure meets the sustainability and predictability dimensions of financial prudence. While the flow-on rating implications of the increased capital costs associated with the different options are now offset by the TIF grant, the increased operating costs associated with options 2A, 2B and 3 are not. As a result these costs will increase the district wastewater rate. It is also important that the TIF grant can be allocated against any of the four options. If it is accepted that option 1 is a viable option and has the least cost then from a financial prudence perspective it is difficult to see how Council could justify adopting an alternative option when considering this in isolation.

152 To balance the financial cost factor with other relevant considerations the attached business case uses a multi-criteria analysis that considers the economic, environmental, cultural and social aspects of the different options. This analysis is a useful tool for informing Council’s decision-

making process in that it seeks to balance a number of competing factors including community views. As a result Council should be cautious about making a decision that does not align with the evaluation assessment outcome.

Project Timelines

- 153 The timelines associated with the development and implementation of Option 2A (refer section 4.6 of the business case) show that it can be implemented by 30 November 2020 if approval is given to proceed now.
- 154 Development of the pipeline route and design is largely complete and preparation of tender documents is well advanced. This process will continue with tenders sought once Council has made a decision on 23 October.
- 155 As noted decisions around the construction of additional storage and a membrane filter as identified in Option 2A will require further elements of design work but are still expected to be able to be completed by the 2020 deadline.
- 156 If Council decided to pursue Option 3 it is important to consider that the existing discharge consent to the Upukerora River adjacent to the settlement ponds expires on 30 November 2020. While Council has a reasonable chance of having the term of this consent extended through to 22 December 2021, to coincide with the lapse date for the Kepler consent it has a 'low chance' of extension beyond that date given recent changes to the regulatory environment.
- 157 Discharge by SDI method would also require a new resource consent. Provided Council were successful with having the current Upukerora discharge consent extended to December 2021, it is anticipated that an SDI discharge system could be designed and constructed within this timeframe. This would require, however, a 'straight forward' consenting process with consent ideally being issued by September 2019.
- 158 Any SDI consenting process would need to be run concurrently with the Upukerora consent extension and the SDI design process. Should the SDI or Upukerora extension consenting processes become protracted and at risk of missing the September 2019 deadline then Council would need to make a decision to default back to a CPI option. In order to maintain CPI as a default option there would also need to be a degree of CPI design undertaken concurrently with SDI design and consenting to ensure this default option is able to continue to meet required timelines (completion by November 2020). Further risk is evident in relation to the SDI detailed design being completed concurrently with the SDI consenting process. This could lead to SDI design requiring revision following consent conditions being finalised. If either of these risks eventuated there will be further 'sunk' costs that would need to be 'written off'. The following table provides further clarity around these timelines:



- 159 Council are also aware that any decisions made around the business case and future direction must also be consistent with resolutions passed at previous meetings. Attention is drawn to resolution (j) from its meeting of 16 November 2016 where *‘Council agree that it is unacceptable for the Council not to have a consented discharge for the Te Anau Wastewater Scheme’*.
- 160 Effectively, this commits Council to having a new discharge up and running prior to the expiry of the current consent in order to continue operating legally. It is important to note that this could also involve a re-consenting process for the current Upukerora discharge as well as the variation to the Kepler Consent to allow for SDI.

Community Views Including Iwi – Ngāi Tahu

- 161 It is the responsibility of the Council to consider the range of community views that exist, balance these with the range of other factors that need to be considered and then make a decision on how to proceed in the best interests of the district as a whole.
- 162 Under Section 78 of the Local Government Act 2002, the Council is required to consider the range of community views that might exist in making any decisions. Section 78(3) makes it clear that this requirement alone does not require Council to undertake a community consultation process to enable an understanding of the range of views to be developed. The Court of Appeal (CA 258/2009) have made it clear that the provision requires the identification of the range of views that might exist and then the consideration of those views.
- 163 It is clear that there are a number of people within the Te Anau and Manapouri communities who are concerned about the current Kepler consented option and disposal at the Kepler site.
- 164 In relation to the discharge method issue FSO have indicated that regardless of the level of treatment of the wastewater they do not support the use of Centre Pivot Irrigation but prefer it to be disposed of through a sub-surface discharge field.
- 165 The use of a CPI discharge method at the Kepler Block has been identified as Council’s preferred option in previous long term plans and therefore has been subject to community consultation via

the drafts of these documents. Council will have considered the views expressed in adopting the Kepler option.

- 166 Given that the wastewater activity is treated as a district wide activity, and funded accordingly, it is appropriate that the Council also consider the views of other wastewater users and district wide ratepayers, in general, as they are also required to fund the costs and risks associated with the options chosen by the Council.
- 167 It is reasonable to expect that, in addition to appropriately addressing the environmental impacts of any proposal, there will be ratepayers who also expect the Council to manage the financial aspects of the project in a prudent and cautious way.
- 168 A further view to be considered is that of Ngāi Tahu as local tangata whenua. Ngāi Tahu (through Te Ao Mārama Incorporated) has been a key stakeholder in the development of the overall Te Anau Wastewater Strategy initially through involvement with the original Infrastructure Working Party and more recently through membership of the Te Anau Wastewater Discharge Project Committee.
- 169 Throughout the development of the overall wastewater strategy Ngāi Tahu have been consistent in their message that direct discharges to water are unacceptable and should not be considered if a land based treatment and disposal is possible.
- 170 The views of Ngāi Tahu within the Lake Te Anau catchment are particularly relevant because under the Ngāi Tahu Claims Settlement Act 1998 Te Ana-au (Lake Te Anau), Moturau (Lake Manapouri), and the Waiau River are statutory acknowledgement areas. This means that the consenting authorities need to have regard to the statutory acknowledgement in the processing of any consents. Their views are also relevant under section 77(1)(c) of the Local Government Act 2002.
- 171 It is noted that the disposal of treated wastewater can be an emotive issue for communities and it is understandable that there are people who are unhappy with CPI and discharge at the Kepler. It is also important to note however, that there are others in the community who support the consented option and others who just want Council to make a decision and get on with implementing that decision as the Te Anau community needs a suitable long term discharge option.

Costs and Funding

- 172 It is important that the committee understands that the estimates provided are still estimates and the full cost will not be known until tenders are sought. The estimated costings will continue to evolve as the design is refined.
- 173 Detailed costings are included in the business case and following the development of the Basis of Design report these have been updated now that there is a greater level of certainty around the costs for both a CPI and SDI based discharge system.
- 174 As a result of the further work complete the projected capital costs have increased. The main differences between the costings are summarised in the following table:

Option(s)	Change in Estimate	Comment
<i>Additions</i>		
All options	\$800k CPI \$480k SDI	Increased buffer storage at Te Anau ponds to account for comparative requirement between CPI and SDI, and recent data and modelling on extreme weather events requiring extra storage generally
All	\$100k	Increased allowance to prepare the Environmental Management Plan. Additional baseline monitoring required, and increased documentation.
All	\$800k	Main transfer pipeline re-budgeted based on specific developed 2018 design, pricing indications from contractors, and use of polyethylene pipeline material.
CPI options	\$280k	Allow more balance tank storage for trickling filter pump station and increased pump cost
CPI options	\$150k	Add removal of existing northern shelter belt tree stumps to make ongoing pasture management easier and safer. Save usable firewood timber. Based on tendered prices.
SDI option	\$250k	Shelter belt work as above, plus removal of southern shelter belt to prepare ground for SDI irrigation field.
All	\$70k	Increased site fencing scope, to provide full deer fence around site, fence off accessway from State Highway.
CPI options	\$180k	New allowance for some contouring of irrigation field
SDI option	\$110k	New allowance for some contouring of irrigation field
CPI options	\$200k	Two additional pivots to avoid peat bog and allow Southern shelter belt to remain
SDI option	\$250k	Refined bottom-up estimate, with 45Ha vs 37Ha initial field size.
<i>Savings</i>		
Options 2B, 3	\$1.6M	Full-flow membrane plant cheaper, based on contractor estimates from recent comparable project
Option 2A	\$300k	Base-flow membrane plant cheaper, based on contractor estimates from recent comparable project
Options 2A, 2B, 3	\$110k	Use of membrane filtration allows main pump station building to be combined into membrane building.

175 The following table summarises the difference between the 2017 and 2018 capital cost estimates:

Option	December 2017 Estimate	August 2018
1. Consented CPI	\$14.5M	\$17.6M
2A. CPI + Baseflow MF	\$17.4	\$20.1
2B. CPI + full flow MF	\$19.4	\$20.8
3B. SDI + full flow MF	\$21.8	\$22.2

- 176 Appendix 9 of the business case details the principal movements in the project estimates since the initial business case was considered by Council in December 2017. These changes have seen the estimated capital cost for Option 2A increase from \$17.4M to \$20.1M. The underlying reason for the increase is the addition of extra scope is to increase the quality and reliability of project outcomes, and reduce project risk. In particular, there has been the need for an increase in buffer storage at the Te Anau ponds, a re-budgeting of the main transfer pipeline based on a specific (vs generic) design and a more resilient PE pipe material, and further work at the Kepler site to make it easier to operate and more resilient during extreme weather events.
- 177 With the inclusion of these changes, the project estimate is the best available reflection of the likely capital costs. The majority of the major capital item estimates have been discussed with contractors and recognise the feedback received. Where this has not been available, estimates have been prepared by Stantec.
- 178 Aside from normal allowances for contingency and P&G, there is a general allowance of 5% Scope Risk Contingency. This allows for further minor items which may be found to be necessary during detailed design. A formal statistical assessment of the estimate accuracy has not been undertaken but Stantec's judgement is that it is accurate to +/-10% with a good level of confidence, and +/-20% with a high level of confidence. The estimate is based on 2018 costs with no further allowance for inflation.
- 179 The 2018-2028 Long Term Plan (LTP) includes a budget of approximately \$14.7 million. This was the cost estimate of the preferred option in the business case as presented to Council in December 2017, with inflation added for year two. The business case presented to Council in December 2017 identified option 1 as the preferred option and included additional capital expenditure required from the 2015-25 LTP to complete the work.
- 180 Also included in the 2018-2028 LTP are changes to the operational expenditure for Option 1 based on the business case presented in December 2017. These costs changed from the 2015-2025 LTP. The most significant change to operational costs in the 2018-28 Long Term Plan is that the cut and carry operation will break even rather than produce a surplus that can be used to offset any other costs.
- 181 Since the adoption of the 2018-2028 Long Term Plan, Council has made a successful application to the Tourism Infrastructure Fund administered by the Ministry Business, Innovation and Employment. Approval has been given for a contribution of \$5 million towards the completion of the scheme. Negotiation is ongoing for the milestones and timing of payments to be made. For the purposes of these calculations, this funding is used to reduce the loans in later years of construction for each option.
- 182 Calculations have been completed for the expected impact on rates for each option including capital and operational expenditure and the contribution from the Tourism Infrastructure Fund. These are all based on the information included in Appendix 5 of the business case attached, with inflation added from the assumptions used for the 2018-2028 Long Term Plan.
- 183 All operational expenditure is funded directly from rates in the year that it is incurred. Capital expenditure is to be funded from available development contributions, depreciation reserves, and grants received with the remainder funded by loans over 30 years. Unless specifically stated the loans are serviced directly from the district wastewater rate.

184 The option chosen and capital construction period impacts on when the changes to operational expenditure would occur in different years. For Option 3 an additional \$150,000 has been allowed above consent costs in the business case for extension to the current discharge to the Upukerora River.

185 The expected district wastewater rate (GST exclusive) under each option is shown in the table below. The table includes the district wastewater rate as per the 2018-2028 LTP and the percentage increase in the LTP. The rates finally struck for each option each year will differ depending on any changes made in the Annual Plan/Long Term Plan process. The amount in the LTP includes capital of \$14.7 million with no funding from MBIE; options 1-3 are based on the capital and operational costs in appendix 5 of the business case and include the \$5 million funding from MBIE.

Year	2018 /19	2019 /20	2020 /21	2021 /22	2022 /23	2023 /24	2024 /25	2025 /26	2026 /27	2027 /28
Rate per 18-28 LTP	\$391	\$404	\$442	\$446	\$470	\$497	\$529	\$542	\$553	\$566
Percentage increase per LTP	1.88%	3.29%	9.50%	0.89%	5.51%	5.60%	6.50%	2.46%	2.03%	2.34%
Rates - Option 1	\$390	\$400	\$446	\$449	\$475	\$504	\$538	\$551	\$562	\$575
Rates - Option 2A	\$390	\$401	\$465	\$470	\$496	\$524	\$559	\$572	\$583	\$597
Rates - Option 2B	\$390	\$401	\$470	\$475	\$501	\$529	\$563	\$577	\$588	\$602
Rates - Option 3B	\$390	\$396	\$421	\$471	\$509	\$535	\$568	\$582	\$593	\$607

186 The district wastewater rate (GST exclusive) set for 2018/2019 is \$390. The table above shows that under the preferred Option 2A, this rate would increase to \$597 in 2027/2028. Residential ratepayers are impacted by GST inclusive rate of \$449 in 2018/2019 increasing to \$686 in 2027/2028.

Alternative Options for Funding Increased Costs between Options

187 Wastewater is currently funded using a district wide catchment. As part of its December 2017 decision Council asked for advice on the options that might exist for funding the difference in costs between Option 1 and Option 3, should the Council decide to pursue this option. With the change to 2A as the preferred option in the business case these funding alternatives are also provided between Option 2A and Option 3.

188 Under the Revenue and Financing Policy the wastewater activity is funded by a district wide targeted rate on users. A decision to fund part of the scheme costs in a different way would represent a decision that was inconsistent with the existing revenue and financing policy. Under

section 80 of the Local Government Act 2002, Council is able to make such a decision. It simply needs to record the inconsistency, the reason for making the inconsistent decision and whether it intends reviewing its policy as a result of making the decision.

- 189 If Council was to come to the view that it wished to change the existing Revenue and Financing Policy then it would need to consult on the proposed changes using the special consultative process. Historically consultation on the revenue and financing policy occurs at the same time as the Long Term Plan. Any additional rating types are consulted on as part of an Annual Plan or Long Term Plan.
- 190 The alternative options provided for funding the increased costs are based on the Te Anau Community Board Area and Manapouri Community Development Area. The rates included in the 2018-2028 for these communities are in the table below (GST exclusive):

Year	2018 /19	2019 /20	2020 /21	2021 /22	2022 /23	2023 /24	2024 /25	2025 /26	2026 /27	2027 /28
Rate included in the 2018-2028 Long Term Plan (excluding GST)										
Te Anau CB	\$253	\$253	\$252	\$252	\$252	\$237	\$258	\$258	\$271	\$262
Manapouri CDA	\$239	\$283	\$288	\$293	\$300	\$306	\$313	\$436	\$358	\$367

- 191 The additional costs, associated with Option 3, could be recovered through the current Te Anau Community Board Rate and the Manapouri Community Development Area rate. This would be applied to 2,285 rating units in Te Anau and 287.50 units in Manapouri. The difference between Option 1 and Option 3 is between \$216 thousand and \$312 thousand per annum. The amount to be recovered and the additional rates required from each ratepayer in the relevant community is shown in the table below:

Te Anau Wastewater Discharge Project Committee

12 October 2018

Year	2018 /19	2019 /20	2020 /21	2021 /22	2022 /23	2023 /24	2024 /25	2025 /26	2026 /27	2027 /28
Additional costs between Option 1 and 3	\$-	\$-	\$-	\$215,748	\$323,127	\$310,048	\$297,341	\$301,709	\$306,375	\$311,509
Amount to be added to the existing Te Anau Community Board Rate (GST exclusive) if all additional rates are collected through it										
Te Anau Community Board	\$-	\$-	\$-	\$95	\$141	\$136	\$130	\$132	\$134	\$136
Amount to be added to the existing Te Anau Community Board Rate and Manapouri Community Development Area (GST exclusive) if all additional rates are collected through them										
Te Anau Community Board	\$-	\$-	\$-	\$84	\$126	\$121	\$116	\$117	\$119	\$121
Manapouri CDA	\$-	\$-	\$-	\$84	\$125	\$121	\$116	\$117	\$119	\$121

- 192 The difference between Option 2A and Option 3 is between \$10 thousand and \$107 thousand per annum. The amount to be recovered and the additional rates required from each ratepayer in the relevant community are shown in the table below::

Year	2018 /19	2019 /20	2020 /21	2021 /22	2022 /23	2023 /24	2024 /25	2025 /26	2026 /27	2027 /28
Additional costs between option 2A and 3	\$-	\$-	\$-	\$10,418	\$119,089	\$107,062	\$95,137	\$95,886	\$96,762	\$97,749
Amount to be added to the existing Te Anau Community Board Rate if all additional rates are collected through it										
Te Anau Community Board	\$-	\$-	\$-	\$5	\$52	\$47	\$42	\$42	\$42	\$43
Amount to be added to the existing Te Anau Community Board Rate and Manapouri Community Development Area if all additional rates are collected through them										
Te Anau Community Board	\$-	\$-	\$-	\$4	\$46	\$42	\$37	\$37	\$38	\$38
Manapouri CDA	\$-	\$-	\$-	\$4	\$46	\$42	\$37	\$37	\$38	\$38

- 193 As an alternative to targeting all properties within the Te Anau and Manapouri communities, the additional rates required could be funded from ratepayers who live within the existing Te Anau Community Board and Manapouri Community Development Area rating areas and pay the

district wastewater rate. This would be applied to 2,966.50 rating units in Te Anau and 343 units in Manapouri. These rating units are calculated using the same methodology as the current district wastewater rate. There are a number of properties (eg motels) in these areas who would pay multiple units of this charge.

- 194 The difference between Option 1 and Option 3 is between \$216 thousand and \$312 thousand per annum. The amount to be recovered and the new rate required by rating unit in the relevant community are shown in the table below:

Year	2018 /19	2019 /20	2020 /21	2021 /22	2022 /23	2023 /24	2024 /25	2025 /26	2026 /27	2027 /28
Additional costs between option 1 and 3	\$-	\$-	\$-	\$215,748	\$323,127	\$310,048	\$297,341	\$301,709	\$306,375	\$311,509
New rate applied per wastewater connection in the current Te Anau Community Board rate area										
Te Anau Community Board	\$-	\$-	\$-	\$73	\$109	\$105	\$100	\$102	\$103	\$105
New rate applied per wastewater connection in the current Te Anau Community Board and Manapouri Community Development rating areas										
Te Anau Community Board	\$-	\$-	\$-	\$65	\$98	\$94	\$90	\$91	\$93	\$94
Manapouri CDA	\$-	\$-	\$-	\$65	\$97	\$94	\$90	\$91	\$93	\$94

- 195 The difference between Option 2A and Option 3 is between \$10 thousand and \$107 thousand per annum. The amount to be recovered and the new rate required by rating unit in the relevant community are shown in the table below:

Year	2018 /19	2019 /20	2020 /21	2021 /22	2022 /23	2023 /24	2024 /25	2025 /26	2026 /27	2027 /28
Additional costs between Option 2A and 3	\$-	\$-	\$-	\$10,418	\$119,089	\$107,062	\$95,137	\$95,886	\$96,762	\$97,749
New rate applied per wastewater connection in the current Te Anau Community Board rate area										
Te Anau Community Board	\$-	\$-	\$-	\$4	\$40	\$36	\$32	\$32	\$33	\$33
New rate applied per wastewater connection in the current Te Anau Community Board and Manapouri Community Development rating areas										
Te Anau Community Board	\$-	\$-	\$-	\$3	\$36	\$32	\$29	\$29	\$29	\$30
Manapouri CDA	\$-	\$-	\$-	\$3	\$36	\$32	\$29	\$29	\$29	\$30

Accounting Treatment of Costs Incurred to 30 June 2018

- 196 The Annual Report for 30 June 2018 includes work in progress of \$2.4 million for costs incurred in gaining the current CPI consent, development of technical information required to support the current options and design of various components.
- 197 The capitalised consent supports Option 1 in the business case and could be continued to be used with Option 2A and 2B. If the final asset that Council owns is supported by a different consent then accounting standards will require the existing work in progress to be written off and expensed in the Statement of Comprehensive Income and Expense.

Policy Implications

- 198 The 2018 Long Term Plan provides for the development of a new system at the Kepler Block based on Option 1 at a projected capital cost of \$14.7 million.
- 199 It is noted that procurement of the preferred option will be undertaken in line with Council's current Procurement Policy.
- 200 The funding mechanisms currently proposed are in line with the Revenue and Financing Policy.
- 201 Council's external debt levels, as a result of this project, will be in line with Council's Investment and Liability Management Policy. The policy requires that net external debt not exceed 100% of total revenue.

Analysis

Options Considered

- 202 The options considered are those that have been scored through the business case. An option of doing nothing is not considered to be realistic given that Council needs to have a new consented discharge in place by December 2020.

- 203 When compared to the current arrangements any of the four options considered collectively display an advantage over the present discharge. For example, each option will be more acceptable to iwi and other stakeholders as it removes the current direct discharge to water. Also, each of the options will deliver similar environmental performance through nutrient removal and pathogen die off. The analysis of options below considers the advantages and disadvantages of each option relative to the other options scored. Hence if there is a collective benefit from each one it is not included in the table.
- 204 Option 1 Consented Option - pipeline to Kepler with irrigation via centre pivot utilising LESA technology with provision of land treatment via nutrient uptake through pasture and bacteria die off from both UV radiation and from natural sunlight and also as treated wastewater passes through the soil. Additionally, odour risk would be controlled by a trickling filter. The irrigated areas will be to the north of the southern-most shelter belt (which will be enhanced with further planting). Other control measures include optimising droplet size and not irrigating in windy conditions and design of the irrigators so no spray is up into the atmosphere via an end gun.
- 205 Option 2A - this is essentially similar to Option 1 with addition of a membrane filter at the oxidation ponds to treat flows up to 2,200 m³. This would provide additional treatment for the majority of occasions. The irrigated areas will be to the north of the southern-most shelter belt (which will be enhanced with further planting). Other control measures include optimising droplet size utilising LESA technology and not irrigating in windy conditions and design of the irrigators.
- 206 Option 2B - This is essentially the same as Option 1 but with a membrane filter sized to treat flows to the consented peak of 4,500 m³. The irrigated areas will be to the north of the southern-most shelter belt (which will be enhanced with further planting). Other control measures include optimising droplet size and not irrigating in windy conditions and design of the irrigators so no spray is up into the atmosphere via an end gun.
- 207 Option 3 - This is similar to Option 2B with membrane treatment up to peak flow of 4,500 m³ but with further land based treatment through sub surface drip irrigation rather than centre pivot irrigation. Further filtration will also be required at the Kepler site to deal with any solids material generated within the pipeline. There will also be a requirement for some odour control from air discharged across the disposal area, and any tanks and pumping wells up front of the irrigation area. Further advice is attached outlining a number of factors that would need to be taken into consideration when looking at a sub-surface irrigation system.

Analysis of Options

Option 1 – Consented CPI, \$17.6M

<i>Advantages</i>	<i>Disadvantages</i>
<ul style="list-style-type: none"> • Scored second of the four options • Meets needs of the project • Can be delivered with least cost • Is consistent with the 2018 LTP 	<ul style="list-style-type: none"> • Unpopular with opponents • Perception issues such as spray drift and odour associated with centre pivot irrigation.

<i>Advantages</i>	<i>Disadvantages</i>
<ul style="list-style-type: none"> • Can readily be adopted to meet higher environmental standards in future • Can readily be expanded to meet future growth driven demand • Retention of southern shelter belt provides screening round irrigation area • Utilises proven and well understood processes and technology • Lowest technical and operator input of the four options • Lowest CAPEX and NPV • Can be delivered by the deadline of December 2020. 	<ul style="list-style-type: none"> • Reduced environmental performance in comparison to other options given absence of membrane filtration.

Option 2A – CPI and base flow membrane filter, \$20.1M

<i>Advantages</i>	<i>Disadvantages</i>
<ul style="list-style-type: none"> • Highest scoring option • Provides additional treatment of flows for the majority of time • Comes out highest in sensitivity analysis of the evaluated options. • Can be delivered by deadline of December 2020. 	<ul style="list-style-type: none"> • Limited industry experience of membrane filtration for wastewater treatment • Centre pivot irrigation is likely to be unpopular despite an improvement in effluent quality for the majority of time and the proposal to utilise low pressure application technology. • Although this scores highest there is no requirement for a membrane plant to meet consent conditions. • Perception issues such as spray drift and odour associated with centre pivot irrigation.

Option 2B – CPI and full flow membrane filter, \$20.8M

<i>Advantages</i>	<i>Disadvantages</i>
<ul style="list-style-type: none"> • Provides additional treatment for all flows • Can be delivered by deadline of 2020. 	<ul style="list-style-type: none"> • Limited industry experience of membrane filtration for wastewater treatment • Centre pivot irrigation is likely to remain unpopular despite improvement in effluent quality for the majority of time and the proposal to utilise low pressure application technology. • Perception issues such as spray drift and odour associated with centre pivot irrigation.

<i>Advantages</i>	<i>Disadvantages</i>
	<ul style="list-style-type: none"> • Additional CAPEX and NPV

Option 3 – SDI and full flow membrane filter, \$22.2M

<i>Advantages</i>	<i>Disadvantages</i>
<ul style="list-style-type: none"> • Provides additional treatment for all flows • Sub-surface irrigation is the preferred disposal route for a section of the community • Construction of the disposal area can be staged to match growth. 	<ul style="list-style-type: none"> • Additional CAPEX and NPV • Limited industry experience of sub surface irrigation in comparison with centre pivot irrigation • There will still be a need for odour control at Kepler • Requires further level of filtration to deal with solids generated in the pipeline which will in return require collection and return to the oxidation ponds as they cannot be discharged. • No significant environmental benefit derived over either Option 2A and 2B with additional costs incurred. • Sub-surface irrigation is less well understood and carries higher degree of risk. This is especially given the fact this would be by far the largest SDI field in the country. • Ranked lowest option both through original scoring and following the sensitivity analysis. • Will require a significant variation to the current consent, which is likely to involve public consultation. It is unlikely this is therefore achievable by deadline date of December 2020. • Is not consistent with current project objectives and constraints. • Inconsistent with the 2018 LTP. • Needs to consider risks associated with membrane fouling and address these accordingly.

Risk Management

208 Management of risk is the process of identifying, mitigating and where possible eliminating risk. Further, ongoing monitoring of all risks both financial and non-financial is required. It is an important consideration throughout the life of a project or activity and should form a key part of any business case.

209 The business case includes a detailed risk register which is consistent with Local Government Audit and Risk Management Principles. Typically a risk register will identify any risk before considering likelihood of that risk occurring and the impact or consequences from it. The register also considers mitigation measures that can be considered and the effectiveness of these. An assessment can then been made of any residual risk that may still exist which in turn will require consideration of the need for any further control measures.

210 At this stage of the project, the risk register has been utilised to identify risks and either mitigate through design concepts or attribute appropriate contingency estimates. This approach enables management of risk through detailed design or delivery / operations should the risk eventuate.

211 The risk register established as part of the business case process will be refined and updated as the design and project delivery functions progress with relevant controls determined and implemented throughout.

Assessment of Significance

212 Through this report Council is being asked to make a decision on the discharge method to be used for the disposal of wastewater at the Kepler Block. This decision follows on from the decision that it made at its 13 December meeting to approve the business case presented at that time subject to a further decision being made on the discharge method.

213 Since the 13 December decision was made, the cost of the different options being considered has increased and Council also has an increased understanding of the risks associated with each option. The capital cost of the different options available range between \$17.6 million and \$22.2 million.

214 There also continues to be a high level of community and stakeholder interest in the decision to be made and Council must also be cognisant of the requirement to have a new scheme operational by December 2020.

215 Officers are of the view that a decision in accordance with the recommendations contained in this report would constitute a significant decision.

216 As is required in relation to decisions determined as significant, community views have been taken into account through the evolution of the project. This has been done through multiple channels including for example; previous public forum sessions, LTP consultation processes and through the business case evaluation criteria assessment.

Recommended Option

217 When assessed under the weighted criteria Option 2A scores highest following the business case scoring criteria and is the preferred option. It should be noted that option 1 scored second highest. Selecting Option 1 over Option 2A would allow delivery of a compliant project with a lower capital cost of \$2.5 million. Overall the total CAPEX saving between the cheapest option (Option 1) and Option 3 is ~\$4.6 million.

218 On the basis of the recommended option identified within the updated business case, the summary findings of the independent peer review and the additional considerations identified within this report regarding LGA responsibilities, timeline and consenting risks, staff support the recommendation to proceed with Option 2A.

219 It is noted that the Te Anau Wastewater Discharge Project Committee have previously resolved to recommend that Council proceed with Option 3.

220 The Committee are invited to make further comment or recommendation to Council but note that ultimately the responsibility for making a decision and proceeding with any option lies with Council.

Next Steps

221 Subject to approval of the business case recommended option, the next steps will be to focus on elements around project delivery including:

- The business case will be presented to the Finance and Audit and Services and Assets Committees and on to Council for a final decision.
- Completing detailed design of the pipeline
- Finalise tendering documents and follow tender process
- Completing any remaining consenting requirements
- Develop delivery team
- Appoint project manager
- Update communication plan.

Attachments

- A Te Anau Wastewater Business Case - September 2018
- B Basis of Design - Te Anau Wastewater Scheme
- C Aqualinc Memo - Te Anau WWT Irrigation – Storage Requirements and Frequency
- D Avisure - Irrigation Te Anau Bird Strike Assessment
- E Legal Advice - Kepler and Upukerora Consents for Te Anau Wastewater Treatment Plant