Before the Independent Commissioners appointed by the Waimakakriri District Council

In the matter of	the Resource Management Act 1991 (**the Act**)
and	
In the matter of	Proposed Private Plan Change 31 (PC31) to the Waimakariri Operative District Plan by Rolleston Industrial Developments Limited

Brief of evidence of Shane Bishop on behalf of Waimakariri District Council (as Submitter) - 3 Waters Infrastructure

Dated: 21 July 2023

Stantec New Zealand
Level 2, 2 Hazeldean Road
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Evidence of Shane Bishop:

Introduction

1. My full name is SHANE DAVID STEPHEN BISHOP. I am a Senior Principal Engineer at Stantec New Zealand (Stantec NZ). I have a degree in Civil Engineering from Canterbury University (BE (Civil) Hons 1996) and am a Member of Engineering New Zealand.

2. I have 26 years' experience with Stantec NZ and the principal functions of my role are associated with investigation, planning and design of '3-Waters' assets: potable water, stormwater and drainage, and wastewater. These functions extend to project and programme management, and design team leadership.

3. I am familiar with the Rolleston Industrial Developments Ltd (the Applicant) Private Plan Change 31 (PC31) request for the proposed 156 ha residential subdivision at 535 Mill Road, Ōhoka having previously reviewed the Infrastructure Report (14 June 2022) that formed part of the initial application.

Code of conduct

4. In preparing my evidence I have reviewed and agree to comply with the Code of Conduct for Expert Witnesses contained in Part 9 of the Environment Court Practice Note 2023. This evidence has been prepared in compliance with the Practice note. I confirm that the issues addressed in this statement of evidence are within my area of expertise, except where relying on the opinion or evidence of other witnesses, which I will specify. I have not omitted to consider any material facts known to me that might alter or detract from the opinions expressed.

Scope of evidence

5. I have reviewed the PC31 application in relation to the water supply, wastewater system and stormwater network operated by Council which might be impacted by this proposed private plan change. Where appropriate, I have provided comment on the Statements of Evidence from the Applicant as it pertains to these services.

6. In particular, I have read the Applicant Expert Statements of Evidence submitted by

    6.1. **Mr Tim McLeod** (Inovo Projects Ltd); Infrastructure,

6.2. **Mr Eoghan O'Neill** (Pattle Delamore Partners Ltd); Stormwater and Wastewater, and

6.3. **Mr Carl Cedric Steffens** (Pattle Delamore Partners Ltd); Potable Water regarding the 3 waters infrastructure for the proposed development.

7. I have also referred to the evidence of the S42A Council Reporting officer report on 15 June 2023 by **Mr Colin Roxburgh**.

Summary of evidence

Water Supply – Source

8. As stated in Paragraph 17 (P17) of **Mr Steffens'** evidence, the existing community water supply bore BW24/0262 can give an indication of the yield and performance of possible new community supply bores within the PC31 area. However, as noted in P19 and as reflected in the summary information in Figure 3 of **Mr Steffens'** evidence, the actual yield and performance is not clear for the deeper wells from which the community supply would be expected to be drawn from. No testing has been conducted by the Applicant at the proposed deep well locations to validate these assumptions.

9. With reference to P26 of **Mr Steffens'** evidence, inclusion of the existing water supply bore in the N + 1 assessment for redundancy would only be valid where the Ōhoka Water Supply comprises one pressure zone. The current water supply is a semi-restricted feed and the impact of developing a combined water supply system has not been fully addressed in **Mr Steffens'** evidence.

10. I agree with **Mr Steffens** that it is likely that a deep well source in the same aquifer as the existing community water supply bore BW24/0262 would likely not be detrimental to the current shallow groundwater bore abstractions (yield or drawdown interference). However, no testing has been conducted by the Applicant at the proposed locations to validate these assumptions.

11. Two alternative approaches for the source of water have been identified by **Mr Steffens** (P85);

11.1. utilising the existing shallow irrigation bores and

11.2. 'an offsite source' such as from the Rangiora Water Supply.

12. Utilising the shallow irrigation bores would not meet the Drinking Water Quality Assurance Rules related to a Class 1 water source. Some risks of using the existing shallow bores have been raised by the Applicant noting that greater treatment would be required with increased associated compliance monitoring.

13. The implications of providing water from 'an offsite source' has not been addressed by the Applicant and would require greater assessment before being considered.

14. Based on the preliminary assessment submitted as part of **Mr Steffens'** evidence and my understanding the yield and performance of the existing community water supply bore BW24/0262, in my opinion a deep well source drawing from the same aquifer is viable for provision of the water for the proposed private plan change area.

15. The Applicant would need to advance a resource consent application to take and use groundwater for potable water supply, with supporting investigations to address uncertainties as to yield or drawdown inference for existing bores, the yield and performance of the bores within the proposed private plan change area, and abstraction of groundwater from within the Eyre Groundwater Allocation Zone.

Water Supply – Network

16. **Mr McLeod** has noted in his evidence (P41) that the assessment of a community wide water supply system would be carried out at subdivision design stage and has provided an indicative water supply schematic as part of his evidence. The schematic would appear viable in the context of the proposed plan change area provided that a resource consent to take and use groundwater for potable water supply could be obtained from the Canterbury Regional Council.

Wastewater

17. I agree with the opinion of **Mr O'Neill** in his evidence (P38) that a pressure sewer network would be more resilient than a conventional gravity sewer system within this proposed plan change area. I also note that this approach is consistent with the network configuration of the existing Mandeville Ōhoka wastewater scheme. However, as stated by **Mr Roxburgh** in his evidence "*Council policy requires gravity systems to be installed where possible, due to the lower ongoing maintenance and servicing costs*" and *"Council's preference would be for a gravity plus low-pressure system in Res 4A, and low pressure elsewhere only when*

required due to ground conditions". As such the final configuration of the network would need to be agreed with the Council.

18. As stated in P39 of **Mr O'Neill's** evidence, there is a viable approach to conveyance of flows to the Rangiora wastewater treatment plant (WWTP). I agree that proposed approach appears to be viable, and would address the concerns raised by **Mr Roxburgh** in his evidence related to the capacity of the pressure main that services the existing Mandeville Ōhoka wastewater scheme. The allocation of costs for installing these services would need to be agreed with the Council and would extend to any infrastructure upgrades required to accommodate the additional flows. Due to the location remote from Rangiora, these costs will be high and I understand these costs have not been allowed for by Council in their infrastructure planning.

19. I agree with **Mr O'Neill's** evidence (P40) that an initial connection to the pressure main from the Bradleys Road pump station may be viable but further assessment would be required. The capacity of the existing Mandeville Ōhoka wastewater scheme has been designed to accommodate the flows and the future growth within an established catchment. Any possible temporary connection should not compromise the operation of the existing scheme.

Stormwater

20. I agree with the proposed approach to stormwater presented by **Mr O'Neill** in his evidence regarding the use of swales, raingardens and bioscapes to manage and treat stormwater runoff. I note the risks raised by Mr O'Neill regarding the high groundwater table and the potential to intercept groundwater during construction and continued operation with proposed solutions to mitigate those risks. However, it is not clear within the Applicant's evidence what ongoing operation and maintenance would be required for the proposed solution which would be divested to the Council.

21. With reference to P31 of **Mr O'Neill's** evidence, the proposed basin storage area across the proposed plan change area is approximately 52,195 m2. The extent of the treatment proposed is unclear as this has not been provided in Attachment 2 of **Mr O'Neill's** evidence and therefore, I cannot provide further comment.

Conclusions

22. For potable water, there is a viable means to source, treat and distribute water to the proposed plan change area subject to criteria being met. The viability of the proposal is contingent on the ability to obtain a resource consent to take and use groundwater for potable water supply. Further investigations will be required to assess the environmental effects of the water take associated with the proposed well configuration.

23. For wastewater, there is a viable configuration to convey wastewater from the proposed plan change area to disposal at the Rangiora WWTP. The configuration of the collection and conveyance would need to the discussed and agreed with Council. This will involve unplanned infrastructure, and agreement would need to be reached between the Applicant and Council as to the funding mechanism to minimise costs of new infrastructure and upgrades required to the EDS.

24. For stormwater, there appears to be a viable means to treat and dispose of stormwater within the proposed plan change area subject to criteria being met. The viability of the proposal is contingent on the ability to meet the requirements to treat and dispose of stormwater as a permitted activity. My assessment has been based on the evidence as submitted by the Applicant, which was limited as plans of the proposed stormwater treatment basins were not provided.

Shane Bishop

21 July 2023

Stantec

Memo

To:	Waimakariri District Council Planning	From:	Shane Bishop Addington
Project/File:	310205390	Date:	28 July 2022

Reference: PPC31 Submission - 3 Waters Infrastructure

1 Scope of Assessment

Rolleston Industrial Developments Limited has proposed a private plan change seeking rezoning in the Operative Waimakariri District Plan of 155ha of rural land to a mixture of residential and business zones, supported by an Outline Development Plan. Waimakariri District Council seeks external peer review to determine if a submission should be made, including on transportation and infrastructure matters.

The scope of this assessment is to provide a peer review of the private plan change request with a focus on the infrastructure servicing assessment (Appendix G of the s32 assessment). A separate memo will provide an assessment of the transportation elements of the submission (Appendix H of the s32 assessment).

The intent is that this memo will comment on:

- the suitability of assessments undertaken, and
- highlight key gaps and/or potential issues for the infrastructure servicing topics.

This memo takes a broad view of the suitability of the information for the submission process. Further discussions and clarifications of the matters raised may be required at a future stage.

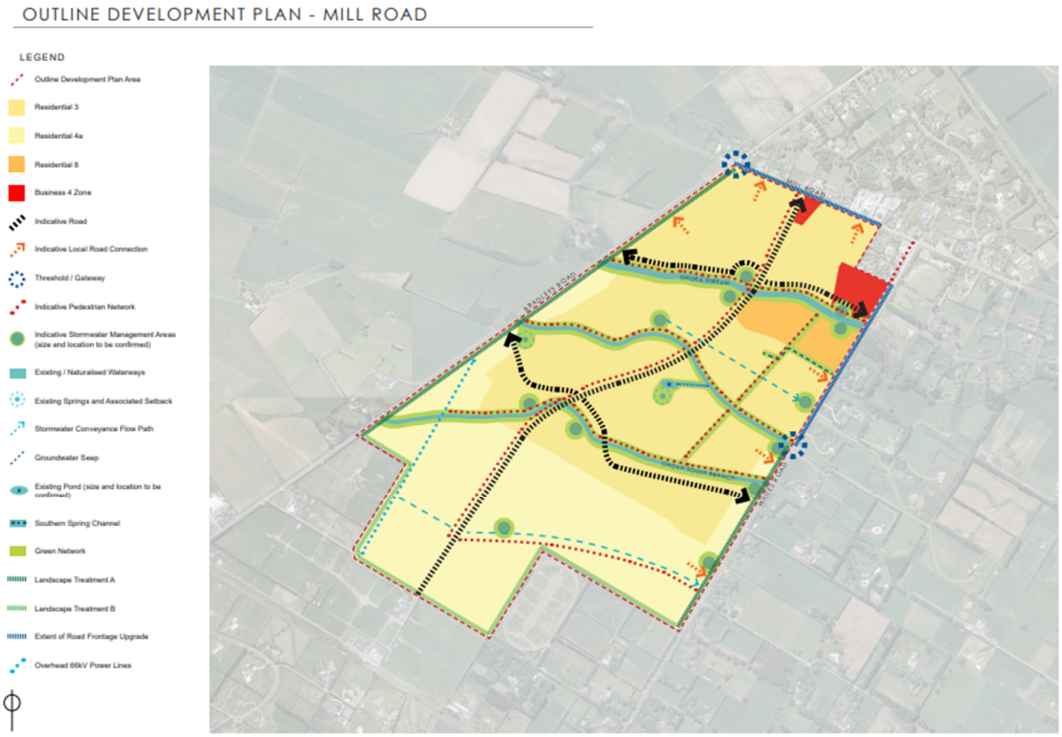
2 Background

Inovo Projects Ltd were engaged by Rolleston Industrial Developments Ltd to complete an Infrastructure Assessment[1] considering the suitability of rezoning the land defined within the Private Plan Change application. This proposed 156ha residential subdivision at 535 Mill Road, Ohoka is intended to support ~ 850 new residential lots, 2 small commercial areas and a special purpose area.

The outline plan for the site in presented in Figure 1 showing the proposed roading network, and configuration of stormwater flow paths through the development.

[1] 'Infrastructure Report – Rolleston Industrial Developments Ltd, Mill Road Ohoka – Plan Change Application Project 14895" Inovo Projects Ltd, 14 June 2022

Figure 1 Outline Development Plan (PDP Stormwater Management Report)



The structure of this memo aligns with the sections of the Inovo Projects Ltd Infrastructure Assessment Report (referred to herein as the 'Assessment') with comments provided accordingly.

3 Wastewater

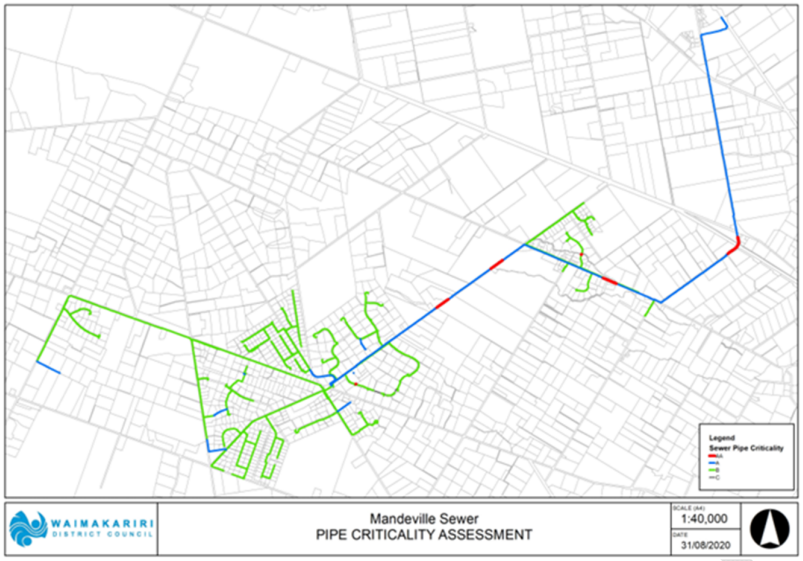
As noted in the Assessment, there is a currently a wastewater network servicing the Mandeville Area and is part of the wider WDC Eastern Districts Wastewater Scheme (EDWS). The configuration of the Mandeville Area Wastewater Scheme and its critical pipelines is presented in Figure 2.

. The design capacity of the scheme (as per the CPG design report 2012) is summarised as:

- A total of 825 properties; comprising 625 properties in Mandeville and 250 properties in Ohoka

It is reported in the Assessment that the number of properties serviced by the Mandeville Area Wastewater Scheme as of 2019 is approximately 536. It would be worth considering what the current number of connections to confirm the current spare capacity in the network given the rate of growth of properties within Mandeville over the last three years. The 2019 population figure has been carried forward in the document and should be reviewed.

Figure 2 Mandeville Sewer - Pipe Criticality Assessment (WDC AcMP 2021)



Options for servicing the development area have been presented in the Assessment. These entail either 1) Gravity System plus LPS or 2) Local Pressure Sewer System. Given the high groundwater table and the flat terrain there is merit in considering a pressure sewer system (PSS) to service the catchment. WDC would need to determine whether this would be an acceptable solution for a development in excess of 850 lots.

In assessing the flows from the development for a PSS, a comparison has been made to the Western Bay of Plenty District Council figures to define PF_{WWF} as 1.5 times ADWF. Using the Mandeville scheme statistics as direct comparison (WDC AcMP 2021) and using the 5 year average figures would equate to a PF_{WWF} 2.0 times ADWF (i.e. 965/481 l/day/connection).

Further to this, the peaking factors presented in Table 3 for Mandeville and Ohoka could be reviewed based on recorded figures. Actual peaking factors are lower than those within the WDC ECoP. Therefore the total flows in the table are conservative.

The Assessment has acknowledged that a new pressure main would be required to service the catchment noting that the proposed number of lots is more than twice that of the current scheme. Noted also is that the likely alignment of the pipeline would parallel the existing pipeline. While some obstacles have been listed, greater detail would need to be provided on the available corridor for the installing the new pipeline. For example, there may be limited space within the berm to install the new pipeline meaning it may need to be installed either at the edge of or within the carriageway.

The summary of flows from the Mandeville Area Wastewater Scheme in the Assessment has accurately identified that there is currently spare capacity and that peak flows are at least partially balanced within the STEP tanks system. Further calculations would be taken to determine how the two schemes could interact.

The Assessment has not fully addressed the impacts of additional connections on the EDWS. Any further evidence will need to address what the addition of 1,020 connections will mean in the context of the available capacity in the EDWS and committed / planned allocations within the scheme.

Odour has not been addressed in the Assessment. It will be an issue particularly within the system where pressure sewer systems are involved. Consideration should be given to odour in any further evidence.

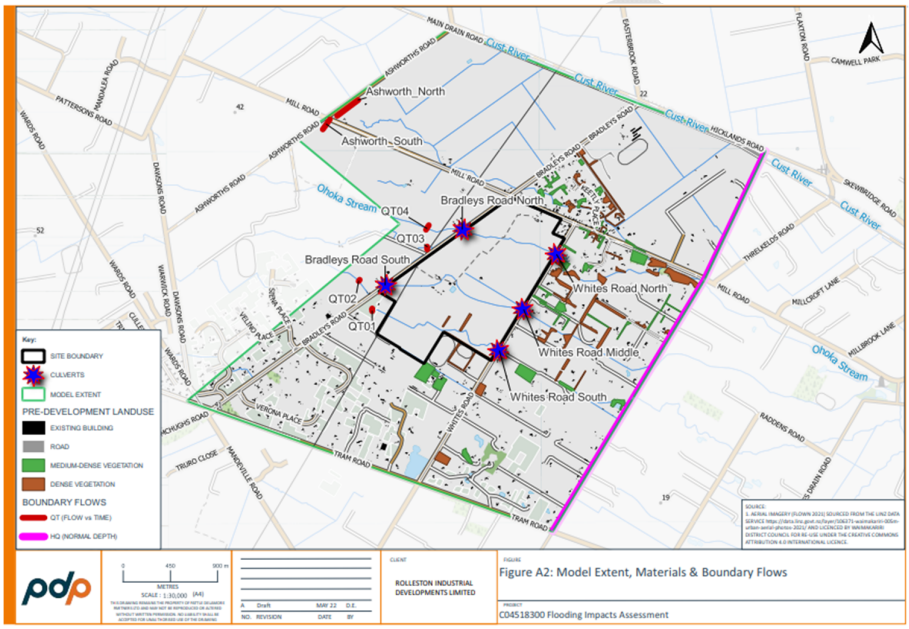
4 Stormwater

The comments in the following section relates to the reports that were submitted in the Assessment and are provided at a high level. I have not completed a check of the background modelling and calculations provided.

PDP[2] has completed a flood hazard assessment for the catchment comparing pre and post development flood levels. The 200-year and 500-year rainfall events have been used to determine catchment wide impacts. The modelling indicated that there is less than minor impact of the development on flood level. However, the peak discharge flows from the site downstream across Whites Road are projected increase slightly. Sufficient attenuation of flows will need to be made within the development.

The configuration of culverts on the boundary of the site are shown in Figure 3 with the flows running from west (Bradleys Road) to east (Whites Road).

Figure 3 Stormwater Model Extents (PDP 2022)



[2] 'Effects on flooding – 535 Mill Road, Ohoka – Stormwater Management', PDP, 2022

There are no comments within the Assessment regarding the capacity of the culverts or any alterations that might be required.

The Assessment[3] has acknowledged the high groundwater table (average 0.64 m below ground level (bgl) but up to 0.14 m bgl) and poorly draining soils at the site. Therefore the proposal needs to address how the design would balance out stormwater conveyance, treatment and detention within tight parameters. An assumption that has been made is that stormwater will be managed by on-site stormwater treatment and attenuation located within the development.

Land drainage within the current site is managed by three prominent land drains across the proposed site. North drain, mid drain, and south drain provide drainage for the site with culverts passing beneath Whites Road. It is proposed that these drains remain the primary form of drainage across the site.

The Assessment has referenced appropriate standards for the determining stormwater flows and treatment. The stormwater treatment techniques nominated are appropriate for the subdivision development. The performance of the systems will depend on the details of the systems in the context of this site. With poorly draining soils and high ground water the configuration of the drainage and treatment systems is important. The planned approach of attenuation basins for each sub-catchment is sound and will keep the basins shallow. However the ability to effectively manage stormwater runoff in the long term would remain a risk due to the ground water levels.

5 Potable Water

The Assessment has summarised the extent and operational parameters of the existing water supply network servicing the existing connections within the Ohoka area. It has also noted the planned future works defined within the WDC LTP (2021-2031) associated with water storage upgrades and development of supplementary water source (bore).

The Assessment proposes an on-demand scheme for the new development which is to be serviced by four wells established on site. The demand figures developed are based on the proposed number of connections and the WDC ECoP and appear appropriate for the subdivision. Although not explicitly stated, the subdivision water supply has been assessed as being completely separate from the existing Ohoka Water Supply scheme with no interactions / connections.

Currently there are shallow wells within the development used for irrigation with a abstraction capacity (both daily and annually) in excess of what would be required for the development. The proposal within the Assessment is that the Consents be transferred to WDC for use as a Community drinking water supply with the consent conditions changed to reflect abstraction from wells at a deeper level. The current wells are up to 19m deep while the well for the current Ohoka water supply scheme is drawing water from 77m deep. Confirmation would need to be obtained from ECan for this approach. For reference, the location and the area of influence for the each of the four wells is provided in Figure 4 (sourced from figure 11 in the Assessment)

The provisions allowed for source water for the subdivision is from three wells and with a fourth well online. This is consistent with the WDC ECoP to have redundancy in supply (N+1 bores for example).

[3] 'Stormwater Treatment – 535 Mill Road, Ohoka – Stormwater Management', PDP, 2022

Figure 4 Indicative Well Spacing (500 m)

The Assessment has nominated that Water Supply infrastructure and storage / pumping provisions will be designed to provide fire fighting flows within the subdivision. Given the proposed density of housing and the business zone areas this would appear to be appropriate.

Treatment requirements for the supply source has not been addressed within the Assessment. It could be assumed that given the bores would been abstracting water from the same aquifer (70-80 m) as the existing Ohoka Water Supply scheme that the same water quality parameters would apply. However, this would not be certain until such time as the wells are developed. This risk needs to be raised and addressed within the submission.

The Assessment has considered the development in isolation from the existing Ohoka Water Supply scheme. There should be comment provided as to how the scheme might integrate with the existing Ohoka Water Supply scheme, developed in conjunction with rather than in isolation from the existing infrastructure.

It is unclear from the Assessment what the configuration of the water supply system would be within the development. From an operational perspective, WDC will need to understand whether the proposal is to develop a well field conveying to centralised storage and treatment or whether storage and treatment would be required at each well head.

6 General Comments

Given the nature of the submission, there is currently little information provided as to the configuration of the infrastructure within the development. To move forward, it would be useful to have an understanding of the pipeline routes, services areas and stormwater treatment configuration within the wider site.

Reference: PPC31 Submission - 3 Waters Infrastructure

I have not commented on the electrical and telecommunication infrastructure items as they are outside my area of expertise.

I am happy to discuss any of the elements contained within this summary memo.

Best regards,

Stantec New Zealand

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