

Appendix 4: Technical Infrastructure Reviews

Memorandum

To: District Plan – Resource Management Policy Team, Waikato District Council
From: Roger Seyb, Beca Ltd
Copy: Carolyn Wratt, WDC Consultant Planner
Subject: Technical Specialist Review, Three Waters – Tuakau, Dominion Road

Date: 16 April 2021
Our Ref: 4214056-1680710091-12

Experience and Qualifications

My name is Roger Morgan Seyb.

I am a Senior Technical Director in the Water Resources and Civil Engineering fields employed by Beca Ltd.

I hold a Bachelor of Civil Engineering degree from the University of Auckland. I am a Chartered Engineer and a Chartered Member of Engineering New Zealand.

I have been working in the civil engineering field since 1990, predominately in New Zealand, and have carried out a wide range of civil engineering, water infrastructure and environmental projects from conception to construction during that time.

1. Introduction and purpose

The purpose of this report is to provide a view as to whether:

- a) Sufficient and appropriate information has been included in the assessment;
- b) The assumptions are sound and reasonable;
- c) The proposed solutions are technically feasible and realistic;
- d) The timeframes for upgrades or connections are realistic; and
- e) There are any potential or actual issues that the planner and Hearings Panel need to be aware of.

2. Documents considered

Documents reviewed:

Statement of Evidence of Peter Alderton on behalf of 2Sen Ltd and Tuakau Estates Ltd

2.1 Limitations

This review is a limited desk top review carried out by reading the above documents and providing general comment on the suitability of the information to be relied upon and recommendations made at the Proposed Waikato District Plan hearing. No site visit has been undertaken and the information referred to in the documents and calculations have not been verified. Detailed knowledge of the constraints within the network was not available - further discussion with the network operator would be required to identify and address any specific constraints within the network.

3. Overview of technical matters

In terms of stormwater the key remaining issues are the need to avoid or manage areas of higher flood hazard on the land to be re zoned and whether there are any effects on undersized culverts and the WRC drainage scheme downstream.

In terms of water supply, there is some uncertainty whether WDC have sufficient water supply for the full long term development intensity sought as a further consent to take water from the Waikato River may be required.

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In terms of water supply and wastewater infrastructure the proposed rezoning is greater than that sought by the WDC 2070 growth plan and therefore the rezoning is outside the current planning. There may be timing and staging issues associated with development connecting to existing public infrastructure. I expect that upgrades to accommodate these additional flows can be designed but they would need to tie with WDC's programme of upgrades and appropriate cost sharing arrangements agreed.

4. Adequacy of assessment

Stormwater

Tonkin & Taylor have prepared a draft Catchment Management Plan (CMP) in 2014 which includes the site sought to be rezoned. However the CMP considers the area as large lot or low density residential and the submitter is seeking it to be zoned to a more intense urban environment with lots down to 450 m². A comprehensive stormwater consent is held by WDC which expires in 2028.

Mr Alderton proposes a stormwater management approach including on site rain tanks for roofs, rain gardens for driveways and community scale constructed wetlands to provide water quality, extended detention and control of peak flows. Discharges are to the Kairoa Stream - which is constricted at the culvert flowing under the North Island Trunk railway line. Flooding has been considered with the main flooding adjacent to the Kairoa Stream contained within proposed reserve land and an overland flow path to be managed by containment within the future road layout. I note that the intensity of development on the site is greater than used in the flood modelling and therefore the results give an indication of potential effects but further assessment of flooding would be required during subsequent design phases.

I generally agree with the proposed approach, although any on site controls may be constrained by space due to the lot sizes proposed. There are some key constrictions on the Kairoa stream identified in the CMP that may need to be upgraded prior to the development going ahead unless 100 year attenuation is provided. However the use of 100 year attenuation needs to be considered further in light of the downstream flooding of the lower section of the Kairoa Stream where there is a WRC drainage scheme and flooding of the Waikato River – it may be better not to attenuate and allow flood flows to discharge prior to downstream peak flows. I suggest feedback from the Wellington Regional Council (WRC) Land Drainage team and WRC catchment team is sought.

Water Supply and Wastewater

The ability of water and wastewater infrastructure to cope with the proposed rezoning needs to be considered at different scales:

- Whether new local infrastructure can be designed and connected to the council's public network;
- Whether the existing network infrastructure between the connection point and the treatment plant requires upgrading to meet the new water supply demand and can receive the increased wastewater discharge; and
- Whether the existing or planned bulk water take(s)/ treatment plant (WTP) and wastewater treatment plant (WWTP) discharge can cater for the increased demand depends upon the existing/planned capacity of the plants and the consents held by WDC.

In general, new local infrastructure will nearly always be able to be designed and connected to the existing council network and a developer would be responsible for appropriately designing and constructing this and vesting it to council as new public network.

As the submitter is seeking lots of between 450 to 600 m², on site wastewater management is not applicable and connection to the public supply is required. The submitter has not specifically addressed the feasibility of new infrastructure within the development area but it is assumed that this is feasible given that they are aware that connection to the public system is required.

The submitter has reviewed the capacity of the local wastewater network for four sections immediately downstream of the development and found it to be adequate for the increased flow. Appendix 5 of the Section 42A framework report identifies that the existing water supply and wastewater network is, or

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will be, physically present for the Dominion Road growth cell and therefore it is reasonable to assume that this network can be upgraded as required to cope with the increased demand and discharge.

The submitter has also carried out checks on the firefighting capacity of the water supply network and these show that there is sufficient flow. The submitter suggests that these also indicate that these indicate there is sufficient daily supply, however I disagree and consider that this is currently unknown as existing demand on the network has not been considered. Confirmation of the adequacy of daily supply requires the network to be hydraulically modelled and consider both existing and proposed demand on the network. Notwithstanding this, I expect that upgrades to the existing local network could be identified and implemented if required.

Another area of uncertainty is whether WDC's existing WTP / water source and WWTP can cater for the proposed rezoning – which is greater than allowed for in the Tuakau Structure Plan. No consultation has been carried out with Watercare on behalf of WDC. Appendix 8 of the Section 42A framework report identifies that the growth planned for the Dominion Road growth cell is from 61 currently to 431 households but this covers an area both north and south of Dominion Road. The submitter's land is partly within the currently identified growth cell and therefore the WTP and WWTP may need further upgrading to meet the additional demand and consents for additional water source takes and discharge may be required. While upgrades to the WTP and WWTP can presumably be designed to meet additional demand, provided appropriate cost sharing can be agreed, there is some risk and uncertainty associated with obtaining additional consents.

Therefore, it is not certain that the full additional water supply demand and wastewater discharge can be accommodated by the WTP and WWTP. However, given that part of the Dominion Road growth cell is on the submitter's land, it is likely staging can be used to accommodate growth in the short to medium term. I recommend that further checking be carried out with Watercare to confirm whether the additional growth can be accommodated by the Tuakau WTP and WWTP and consented.

5. Conclusions

My conclusion is that the development is likely to be able to be serviced for the Three Waters subject to further assessment as follows:

- Considering flood hazard during design of the proposed development geometry and levels to manage potential effects for the proposed intensity of development.
- Checking with WRC Land Drainage section for potential effects on the downstream drainage scheme and the WRC catchment management section for attenuation requirements.
- Checking with Watercare (on behalf of WDC) whether the water treatment plant and wastewater treatment plant capacity and consent can allow for the additional development and if not, whether it can be included.

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To: District Plan – Resource Management Policy Team, Waikato District Council
From: Roger Seyb, Beca Ltd
Copy: Carolyn Wratt, WDC Consultant Planner
Subject: Technical Specialist Review, Three Waters – Tuakau, Kiriimuir Estates
Date: 14 April 2021
Our Ref: 4214056-1680710091-12

Experience and Qualifications

My name is Roger Morgan Seyb.

I am a Senior Technical Director in the Water Resources and Civil Engineering fields employed by Beca Ltd.

I hold a Bachelor of Civil Engineering degree from the University of Auckland. I am a Chartered Engineer and a Chartered Member of Engineering New Zealand.

I have been working in the civil engineering field since 1990, predominately in New Zealand, and have carried out a wide range of civil engineering, water infrastructure and environmental projects from conception to construction during that time.

1. Introduction and purpose

The purpose of this report is to provide a view as to whether:

- a) Sufficient and appropriate information has been included in the assessment;
- b) The assumptions are sound and reasonable;
- c) The proposed solutions are technically feasible and realistic;
- d) The timeframes for upgrades or connections are realistic; and
- e) There are any potential or actual issues that the planner and Hearings Panel need to be aware of.

2. Documents considered

Documents reviewed:

- Statement of Evidence of Ajay Desai on behalf of Kiriimuir Trustee Ltd (Stormwater)
- Statement of Evidence of Ben Pain on behalf of Kiriimuir Trustee Ltd (Water Supply and Wastewater)

2.1 Limitations

This review is a limited desk top review carried out by reading the above documents and providing general comment on the suitability of the information to be relied upon and recommendations made at the Proposed Waikato District Plan hearing. No site visit has been undertaken and the information referred to in the documents and calculations have not been verified. Detailed knowledge of the constraints within the network was not available - further discussion with the network operator would be required to identify and address any specific constraints within the network.

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3. Overview of technical matters

In terms of stormwater the key remaining issues are the need to avoid or manage areas of higher flood hazard on the land to be re zoned and whether there are any effects from proposed discharges on the Waikato regional Council (WRC) drainage scheme to the south west of the site.

In terms of water supply, there is some uncertainty whether WDC have sufficient water supply for the full long term development intensity sought as a further consent to take water from the Waikato River may be required.

In terms of water supply and wastewater infrastructure the proposed rezoning is in addition to that sought by the Waikato 2070 growth plan and therefore the rezoning is outside the current planning. There may be timing and staging issues associated with development connecting to existing public infrastructure.

WSL have advised me that it is unknown whether the area can be serviced and a strategic study of water supply and wastewater is required.

4. Adequacy of assessment

Stormwater

Tonkin & Taylor have prepared a draft Catchment Management Plan (CMP) in 2014 which includes the site sought to be rezoned. However the CMP considers the area as low density residential and the submitter is seeking it to be zoned to a more intense urban environment. A comprehensive stormwater consent is held by WDC which expires in 2028.

Mr Desai proposes a standard stormwater management approach including source control of roofs, two stages of water quality treatment and volume control/extended detention for discharges to natural watercourses. The Tuakau Swamp to the south west of the site is adjacent to the receiving stream which is part of a WRC land drainage scheme. He states flood attenuation may not be required.

I generally agree with the proposed approach, although any on site controls may be constrained by space due to the lot sizes proposed. In addition to the points identified by Mr Desai I note that there are some areas of higher overland flow flood hazard identified in the T&T draft CMP across the site and these would need to be considered as design progresses. In terms of the drainage scheme operation I would expect that it would be better for the flows from the site not to be attenuated so that they discharge prior to any significant increase in flood level within the Waikato River, but there may need to be increases to the local drainage channel size to allow flow to be conveyed to the river. I suggest feedback from the WRC Land Drainage team is sought to confirm this approach.

Water Supply and Wastewater

The ability of water and wastewater infrastructure to cope with the proposed rezoning needs to be considered at different scales:

- Whether new local infrastructure can be designed and connected to the council's public network
- Whether the existing network infrastructure between the connection point and the treatment plant requires upgrading to meet the new water supply demand and can receive the increased wastewater discharge
- Whether the existing or planned bulk water take(s)/ treatment plant (WTP) and wastewater treatment plant (WWTP) discharge can cater for the increased demand depends upon the existing/planned capacity of the plants and the consents held by WDC.

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In general, new local infrastructure will nearly always be able to be designed and connected to the existing council network and a developer would be responsible for appropriately designing and constructing this and vesting it to council as new public network.

Alternatively, on site water supply and wastewater management could be used provided there is sufficient land available for onsite wastewater disposal. In this respect WDC's Section 42A framework report states that residential lot sizes less than 2,500 m² would be expected to connect to the public system (paragraph 296). Notwithstanding this, under appropriate soil and setback conditions, lot sizes of about 1,000 m² could potentially provide on site wastewater treatment for a small to medium sized dwelling.

As the submitter is seeking lots of between 450 to 600 m², on site wastewater management is not applicable and connection to the public supply is required. The submitter has not specifically addressed the feasibility of new on site infrastructure but it is assumed that this is feasible given that they are aware that connection to the public system is required.

An area of uncertainty is whether WDC's existing WTP / water source and WWTP can cater for the proposed rezoning. In consultation with the submitter, Watercare has identified that they are planning to cater for the WDC growth requirements for Tuakau but that Stage 2 upgrading of the WTP is dependent upon an additional water take from the Waikato River (para 7.2). Appendix 8 of the Section 42A framework report identifies that the growth planned for the nearby Dromgools Road growth cell is from 96 currently to 1292 households and the Town Centre from 96 to 564 households. The submitter's land is outside the currently identified growth cells and therefore the WTP and WWTP may need further upgrading to meet the additional demand and consents for additional water source takes and discharge may be required. While upgrades to the WTP and WWTP can presumably be designed to meet additional demand provided appropriate cost sharing can be agreed, there is risk and uncertainty associated with obtaining additional consents.

Therefore, it is not certain that the full additional water supply demand and wastewater discharge can be accommodated by the WTP and WWTP.

I have discussed the development with WSL and they have advised me that it is unknown whether the site can be serviced and that a strategic study of the capacity of water supply and wastewater networks is required to determine this.

5. Conclusions

My recommendations are:

- Considering flood hazard during design of the proposed development geometry and levels to manage potential effects.
- Checking with WRC Land Drainage section for potential effects on the downstream drainage scheme.
- That further consultation with Watercare occur and a strategic study into the capacity of the water supply and wastewater networks and treatment plants is carried out. Checks should also be made into whether any further consents for increased water take or wastewater discharges are required.

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To: District Plan – Resource Management Policy Team, Waikato District Council
From: Skip Fourie, Beca Ltd
Copy: Carolyn Wratt, WDC Consultant
Subject: Technical Specialist Review, Transport – Geraghtys Road, Tuakau

Date: 12 April 2021
Our Ref: 4214056-1680710091-12

Experience and Qualifications

My full name is Gideon Jacobus Scheepers (Skip) Fourie.

I am an Associate Transportation Planner employed by Beca Ltd (Beca), a multi-disciplinary professional services consultancy firm based in New Zealand.

I hold a Bachelor (Honours) of Town and Regional Planning (2007) and a Masters degree specialising in Transportation Planning (2014) from the University of Pretoria in South Africa.

I have a total of 12 years' experience in the field of transportation planning and traffic engineering gained through 6 years of employment in South Africa, 2 years of employment in Dubai, United Arab Emirates and 4 years in New Zealand.

I have wide-ranging experience in traffic and transportation engineering fields, ranging from transport assessments, traffic modelling, safety audits, parking strategies, feasibility studies and business case writing.

1. Introduction and Purpose

Beca has been engaged by Waikato District Council (WDC) to review statements of evidence filed with the Council accompanying submissions seeking a change in zoning under the District Plan. This review provides high level commentary on the suitability of the information and recommendations to be relied upon at the Proposed Waikato District Plan (PWDP) hearing.

The purpose of this assessment is to consider the following aspects of the application:

- a. Has sufficient and appropriate information has been included in the assessment
- b. Are the assumptions sound and reasonable
- c. Are the proposed solutions technically feasible and realistic
- d. Are the timeframes for upgrades or connections realistic; and
- e. Are there any potential or actual issues that the planner and Hearings Panel need to be aware of.

2. Documents Considered

- Statement of Evidence of Siva Balachandran, Dated: 17 February 2021, Waikato District Plan Review Submission

Limitations

As per the agreed scope, this desktop review has been carried out by reading the above documents and providing comment on the suitability of the information and recommendations to be relied upon at the PWDP hearing.

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No site visits have been undertaken and the information referred to in the documents and calculations has not been verified in detail.

3. Overview of Technical Matters

Proposal Overview

The applicant seeks to change the zoning of approximately 38 ha of land located in Tuakau from the current rural zoning to residential zoning. This is predicted to accommodate up to 425 dwellings when completed.

The site once fully developed with housing is likely to generate approximately 470 (two-way) vehicle movements in the peak hours, and a daily volume of about 3,600 vehicle movements.

Access to the Site is proposed via two new priority-controlled intersections fronting directly onto Geraghtys Road.

Scope of evidence

The applicant has provided specific commentary in their statement of evidence on the transport and traffic effects of the proposed rezoning. In general, the evidence covers:

- Overview of the Site
- Summary of the existing traffic environment
- Summary of the Integrated Transportation Assessment (ITA) for Tuakau Structure Plan, prepared by Aecom NZ Limited dated 18 June 2014
- Brief summary of the proposal
- Overview of the predicted traffic generation as a result of the proposed rezoning
- Summary of the traffic and transportation effects of the proposed rezoning and the recommended upgrades to the existing transport network to mitigate the potential effects
- Overview of the compliance with national and regional transport strategies and policies.

Transportation Effects Assessment and Proposed Mitigation Measures

Transport Effects Summary

The assessment indicates that the vehicle trips generated by the proposed rezoning will result in a significant increase in traffic volumes on Geraghtys Road and St Johns Avenue, which current have low traffic volumes. The applicant considers these increases form a small proportion of the increases associated with other rezoning in the PWDP.

Geraghtys Road is a local transport corridor with a carriageway width of 6.5m and no shoulders or car parking provision on either side.

The two proposed Site accesses are expected to comply with PWDP's minimum requirements with respect to separation distances and sight distances.

Based on Austroads design guidance, a right turn bay will be needed for the Site (for at least one access) when the total through traffic volume (both directions) on Geraghtys Road exceeds 160vph. During the interim stage (i.e. before Geraghtys Road traffic volume exceeds 160vph), both access intersections to the Site could operate satisfactorily as 'Tee' intersections without right turn bays.

The submitter has recommended that suitable planning rules are included in the PWDP to assess the cumulative effects of traffic generated from the various areas that are rezoned, and provision is made

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for the interaction upgrades to be funded and built, potentially through a combination of District Plan provisions and development contributions.

The internal road network is expected to be developed in accordance with the PWDP which will support safe and attractive environment for pedestrians and cyclists.

Recommendations and Mitigation Proposed in Evidence

The following recommendations and mitigations are proposed by the applicant:

- That suitable planning rules are included in the PWDP to assess the cumulative effects of traffic generated from the various areas that are rezoned, and provision is made for the following intersection upgrades to be funded and built, potentially through a combination of District Plan provisions and development contributions:
 - Buckland Road / Geraghtys Road intersection be upgraded from the existing priority intersection to an urban compact roundabout.
 - Geraghtys Road / St Johns Avenue be upgraded from the existing priority intersection to an urban compact roundabout when the proposed fourth leg to the intersection is to be constructed.
 - George Street / Buckland Road intersection be upgraded from the existing priority intersection to an urban compact roundabout.
- It has been recommendation in the Aecom ITA that Buckland Road should be upgraded with wider shoulders and pedestrian and cyclist facilities be extended as development proceeds on the western side of Tuakau.

Conclusion

The applicant considers that, on the basis of the assessments carried out, and their recommendations relating to road infrastructure upgrades, the transportation effects from rezoning the site for residential purposes will be sufficiently mitigated to an acceptable and appropriate level, which is generally no more than minor.

4. Assessment Undertaken

The statement of evidence provides a good general overview of the traffic and transportation considerations pertinent to the proposal. There are some specific matters that are unclear to me and I suggest further information is requested to address these.

- The submitted comments that *“The uptake of walking and cycling as a viable alternative to private car use for short trips is reliant on the development of safe and convenient urban connections within the existing and proposed adjoining urban areas. There are presently no existing pedestrian facilities adjacent to the Site on Geraghtys Road”* (Page 26). I agree that safe and convenient connections for pedestrians and cyclists is important. The recommendations do not appear to include new footpaths/cycle path on Geraghtys Road, and I consider that provision should be made for such connections to the existing surrounding networks as part of the application.
- .As far as can be understood from the evidence provided, apart from intersection upgrades, there is no corridor upgrade proposed for Geraghtys Road. With a forecast daily traffic volume of 3,735 vehicles (which includes existing traffic), I question whether the existing form of the road will be suitable for the future function, or if it will need to be upgraded to a more urban form.

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- Related to the above, it is not clear to me whether properties within the Structure Plan could generate parking demand on Geraghtys Road, and if this can be safely accommodated by the proposed form of this road.
- Also related to the above, it is unclear to me as to whether properties within the Structure Plan area will have driveways directly to Geraghtys Road, and if the submitted considers this acceptable or achievable considering relevant District Plan access rules.

5. Conclusions

I generally agree with the findings in the statement of evidence and the submitter's recommendations.

The following points should be addressed / clarified:

- Clarify how will pedestrian and cycle connections to the surrounding network will be made from across the structure plan site
- Clarify whether any upgrades to Geraghtys Road are proposed and if not if the existing form of the road is suitable to support the structure plan
- Clarify if access and parking via Geraghtys Road is anticipated and if the road can safely accommodate such.
- Clarify proposed developer contributions.
- Clarify the proposed suitable planning rules to be included in the PWDP as part of this proposal. In order to assess the cumulative effects of traffic generated from the various areas that are rezoned.

From a traffic and transportation perspective, beyond the matters identified above, I have not identified any additional potential or actual issues that the planner and Hearings Panel need to be aware of in considering the application for live zoning.