**IN THE MATTER** of the Resource Management Act 1991

**AND**

**IN THE MATTER** of an application to **HAMILTON CITY COUNCIL** for private plan change 7 to the operative Hamilton City District Plan by **GREEN SEED CONSULTANTS LIMITED**

# STATEMENT OF EVIDENCE OF EUGENE VODJANKSY

## 1. INTRODUCTION

1.1 My name is Eugene Vodjansky. I am the Principal Water Resource Engineer with Bloxam Burnett & Olliver Limited ("BBO").

### Qualifications and experience

1.2 I am a Chartered Member of Engineering New Zealand since 2013 and I am a licensed Professional Engineer in the U.S. (Colorado) since 2009. I have a Bachelor of Science in Economics (natural resource emphasis) from Montana State University (1997) and completed graduate courses Water Resource Management Engineering at the University of Colorado at Denver. Graduate qualification was not allowed, as my undergraduate degree was not in Engineering.

1.3 I have 33 years of experience in Civil Engineering, including 16 years specifically in water resource engineering. I am a member of Engineering New Zealand, the New Zealand Hydrological Society, Water New Zealand, and the American Society of Civil Engineers for whom I have provided review of submissions Journal of Hydraulic Engineering.

### Involvement in the Project

1.4 I have been involved in the Rotokauri North project since 2020. I was engaged by Green Seed Consultants Limited ("GSCL") to resolve issues in the three waters aspects of the development proposed via Plan Change 7 ("PC7") and redevelop the Rotokauri North sub-catchment integrated catchment management plan ("ICMP") for PC7.

1.5 I have attended several workshop meetings with Hamilton City Council ("HCC") on stormwater, water and wastewater provisions.

1.6 I have also been actively involved in the Tangata Whenua Working Group ("TWWG") to outline the review process undertaken by BBO on the three waters solution for PC7 as notified, and the proposed changes.

1.7 I have prepared or overseen the preparation of *Attachment J Sub-Catchment ICMP Water and Wastewater System Report* and *Attachment K Sub-Catchment ICMP Stormwater System Report* to PC7. I am familiar with the contents of the sub-catchment ICMP prepared by Tollemache Consultants, and have collaborated in the updates to that document which have occurred to align with Attachments J and K.

**Purpose and scope of evidence**

1.8 The purpose of my evidence is to provide:

(a) A high-level description of the proposed water, wastewater, and stormwater systems for PC7; and

(b) Specific information around items that will require resolution through detailed design.

1.9 In that regard, my evidence will address the following matters:

(a) Brief description of the PC7 site (Section 3);

(b) Description of domestic water supply (Section 4);

(c) Description of wastewater management (Section 5);

(d) Description of stormwater management (Section 6);

(e) Comments on HCC's section 42A report ("section 42A report") (Section 7);

(f) Comments on submissions (Section 8);

(g) Comments on the proposed plan provisions (Section 9); and

(h) Conclusions (Section 10).

1.10 A summary of my evidence is set out in Section 2 below.

**Expert Witness Code of Conduct**

1.11 I have been provided with a copy of the Code of Conduct for Expert Witnesses contained in the Environment Court's 2014 Practice Note. I have read and agree to comply with that Code. This evidence is within my area of expertise, except where I state that I am relying upon the specified evidence of another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

## 2. SUMMARY OF EVIDENCE

2.1 For the reasons outlined in my evidence, I consider that, following a substantial reconsideration of stormwater drainage solutions in particular, the PC7 land can be serviced by the necessary three waters infrastructure.

2.2 In summary, my position with respect to each of those matters is as follows.

**The site**

2.3 The PC7 land is comprised of rural land, that is predominantly flat with elevated ground over approximately 15% of the site. The site includes portions of four sub-catchments within the Rotokauri Catchment. These include the Ohote, Te Otamanui, Mangaheka, and Rotokauri South catchments. Highly modified reaches of the Ohote Stream and a tributary of the Te Otamanui Stream extend into the site (as discussed in the evidence of Mr Miller). As Mr Miller also outlines, these streams have been classified by Tonkin and Taylor and a copy of that was provided as Attachment 11 to the PC7 documentation.

**Water supply**

2.4 The PC7 land is currently not serviced by water infrastructure. As such, there is no viable connection to the HCC domestic water distribution for the development that is adjacent to the site boundary.

2.5 Therefore, a 450mm bulk main and 250mm trunk main will be extended from the intersection of Arthur Porter Drive and Roger Kaui Place, along the future East-West Arterial alignment to the Rotokauri North development. This bulk main will extend through the site from the east boundary to the west boundary. The water network within the development will be designed and constructed in accordance with HCC standards.

**Wastewater management**

2.6 The PC7 land is not currently serviced by wastewater infrastructure. As such, there is no viable connection to the HCC domestic water distribution for the development that is adjacent to the site boundary.

2.7 Therefore, a 450mm bulk main will be extended from the intersection of Arthur Porter Drive and Roger Kaui Place, along the future East-West Arterial alignment to the Rotokauri North development. This bulk main will extend through the site from the east boundary to the west boundary.

**Stormwater management**

2.8 As noted, the PC7 land includes portions of four separate catchments: the Ohote Catchment, the Te Otamanui Catchment, the Mangaheka Catchment, and the Rotokauri

South Catchment. With the exception of a low ridge, near the east end of the site, the land is generally very flat. Two streams were identified on the site: the Ohote Stream and a Tributary of the Te Otamanui Stream. These existing streams have been highly modified to function as parts of agricultural drainage networks. The proposed stormwater system for Rotokauri North endeavors re-establish these existing water ways in a manner that provides both stormwater management and environmental benefits.

2.9 The primary goals of the stormwater management system proposed for Rotokauri North include mitigation of downstream effects, flood control, treatment of stormwater runoff from developed areas and safe conveyance of flow from upstream land, while restoring natural more natural stream functions and habitat for the Ohote Stream and the Te Otamanui Tributary.

**Summary**

2.10 In summary, it is my opinion that the PC7 land can be adequately serviced with water supply, stormwater and wastewater management solutions, and that PC7 can be supported with respect to three waters management.

## 3. PC7 AND SITE DESCRIPTION

**Scope of PC7**

3.1 PC7 proposes to rezone approximately 140ha of land located in Rotokauri North, from Future Urban Zone to a mixture of Medium Density Residential ("MDR") and Business 6 ("B6") zones. The PC7 area is shown on the Rotokauri North Structure Plan has already been clearly identified in the application documents and by other experts, as well as in the section 42A report.

3.2 Once rezoned, the PC7 land will be subject to a new Rotokauri North Structure Plan, and specific new rules and provisions in addition to the default provisions of the MDR and B6 zones in the operative Hamilton City District Plan ("HCDP").

**The PC7 site**

3.3 The site consists of 31 parcels of land, predominantly accessed by SH39 or Te Kowhai Road. Currently, these sites are predominantly used as pasture grazing for cattle, as well as some rural-residential activity.

3.4 The site is relatively flat, generally 28 – 30 RL, with some terraces along the southern and eastern edges which are up to 40 RL.

3.5 The Rotokauri North area is within the catchments of the Ohote, Te Otamanui, Mangaheka and Rotokauri South stream networks. However, the majority of the stormwater catchment

discharge is via the Ohote catchment, running predominantly east-west through Rotokauri North, and discharges to the Waipa River, through a culvert located at Exelby Road.

3.6 Catchments for stormwater drainage and flood areas are described in more detail under the "stormwater" section of my evidence below

**ICMP Scope**

3.7 The ICMP covers an area larger than PC7, as it has related to "catchment areas". As such, it includes an additional 63.5 hectares outside of the PC7 area. The majority of this land falls within the "Stage 2 area", as shown in the existing Rotokauri Structure Plan from the HCDP.

## 4. WATER SUPPLY

4.1 Attachment J to the ICMP and Section 6.0 of the ICMP address the concept level design for water supply.

4.2 The PC7 land is currently not serviced by water infrastructure. As such, there is no viable connection to the HCC domestic water distribution for the development that is adjacent to the site boundary. Therefore, a 450mm bulk main and 250mm trunk main will be extended from the intersection of Arthur Porter Drive and Roger Kaui Place, along the future East-West Arterial alignment to the Rotokauri North development. This bulk main will extend through the site from the east boundary to the west boundary. The water network within the development will be designed and constructed in accordance with HCC standards.

4.3 The following **Figure 1** provides an illustration of the proposed water service connection layout:


*Figure 1*

4.4 Within the Rotokauri North development, there are proposed to be three main water networks (these are shown in Figure 14 of the ICMP).

(a) Rotokauri South Water Network has an area of 32.3 Ha, based on the current master plan associated with the PC7.

(b) Te Otamanui Water Network has an area of 70.0 Ha, based on the current master plan associated with the PC7.

(c) Ohote Water Network has an area of 33.8 Ha, based on the current master plan associated with the PC7.

4.5 For land within the area covered by the ICMP, but outside of the PC7 area, provision has been made to enable water service connections for these areas as well. During future developments, Ohote Upstream North will be incorporated into the Ohote Water Network. The Ohote Upstream West and Ohote Upstream East Water Networks will require the completion of trunk main along Exelby and Burbush Roads which will enable the areas to be incorporated into the Ohote and Te Otamanui Water Networks respectively.

4.6 The following **Figure 2** provides an illustration of the proposed ICMP water distribution layout:

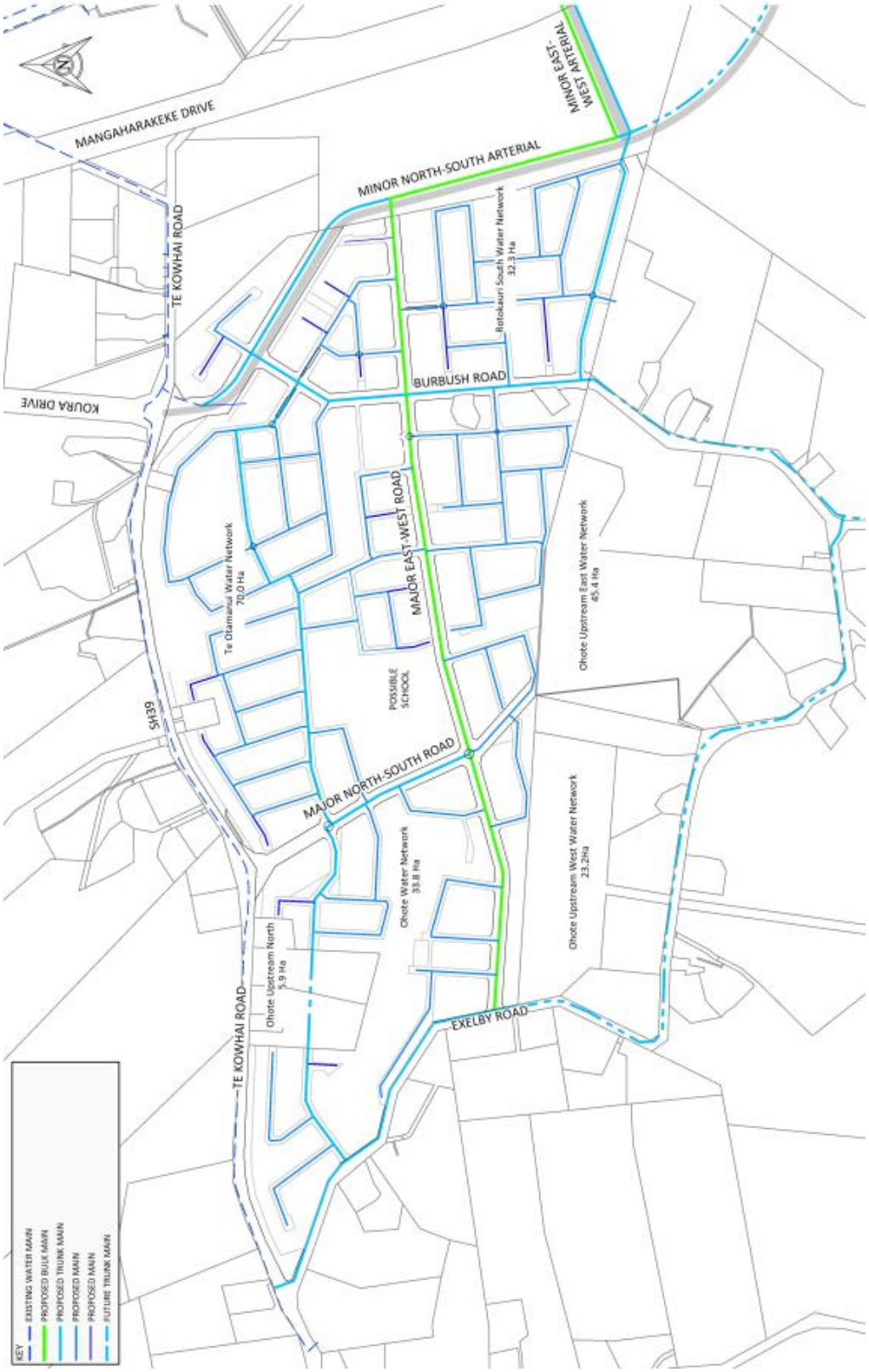


*Figure 2*

## 5. WASTEWATER

5.1 Attachment J to the ICMP and Section 7.0 of the ICMP address the concept level design for water supply.

5.2 The PC7 land is not currently serviced by wastewater infrastructure. As such, there is no viable connection to the HCC domestic water distribution for the development that is adjacent to the site boundary.

5.3 Therefore, a 450mm bulk main will be extended from the intersection of Arthur Porter Drive and Roger Kaui Place, along the future East-West Arterial alignment to the Rotokauri North development. This bulk main will extend through the site from the east boundary to the west boundary.

5.4 Based on the alignment of the wastewater main and the number of pumpstations, the Rotokauri North development was divided into four wastewater sub-catchments (these are shown in Figure 14 of the ICMP):

(a) Rotokauri South WW has an area of 15.8 Ha, based on the current master plan associated with the PC7. Lots within the catchments drain under gravity directly into the gravity main.

(b) Mangaheka WW has an area of 8.7 Ha, based on the current master plan associated with the PC7. Lots within the catchments drain under gravity directly into the gravity main.

(c) Te Otamanui WW has an area of 73.0 Ha, based on the current master plan associated with the PC7. The pumpstation is also assumed to be able to service 21 Ha of the Ohote Upstream East WW catchment. The combined peak wet weather flow is estimated to be 48 l/s, based on assumed land use and density. The pumpstation is connected via a rising main to the upstream manhole of the gravity main.

(d) Ohote WW has an area of 37.8 Ha, based on the current master plan associated with the PC7.. The pumpstation is also assumed to be able to service 7 Ha of the Ohote Upstream West WW catchment. The combined peak wet weather flow is estimated to be 28 l/s, based on assumed land use and density. The pumpstation is connected via a rising to the upstream manhole of the gravity main.

5.5 For land within the area covered by the ICMP, but outside of the PC7 area, provision has been made to enable water service connections for these areas as well. The combined peak wet weather flow is estimated to be 21 l/s, based on assumed land use

and density. A connection point for the wastewater from this pumpstation will be provided at the boundary of the Rotokauri North development along the north-south road that also passes the Te Otamanui pumpstation.

5.6 The following **Figure 3** provides an illustration of the proposed wastewater layout:

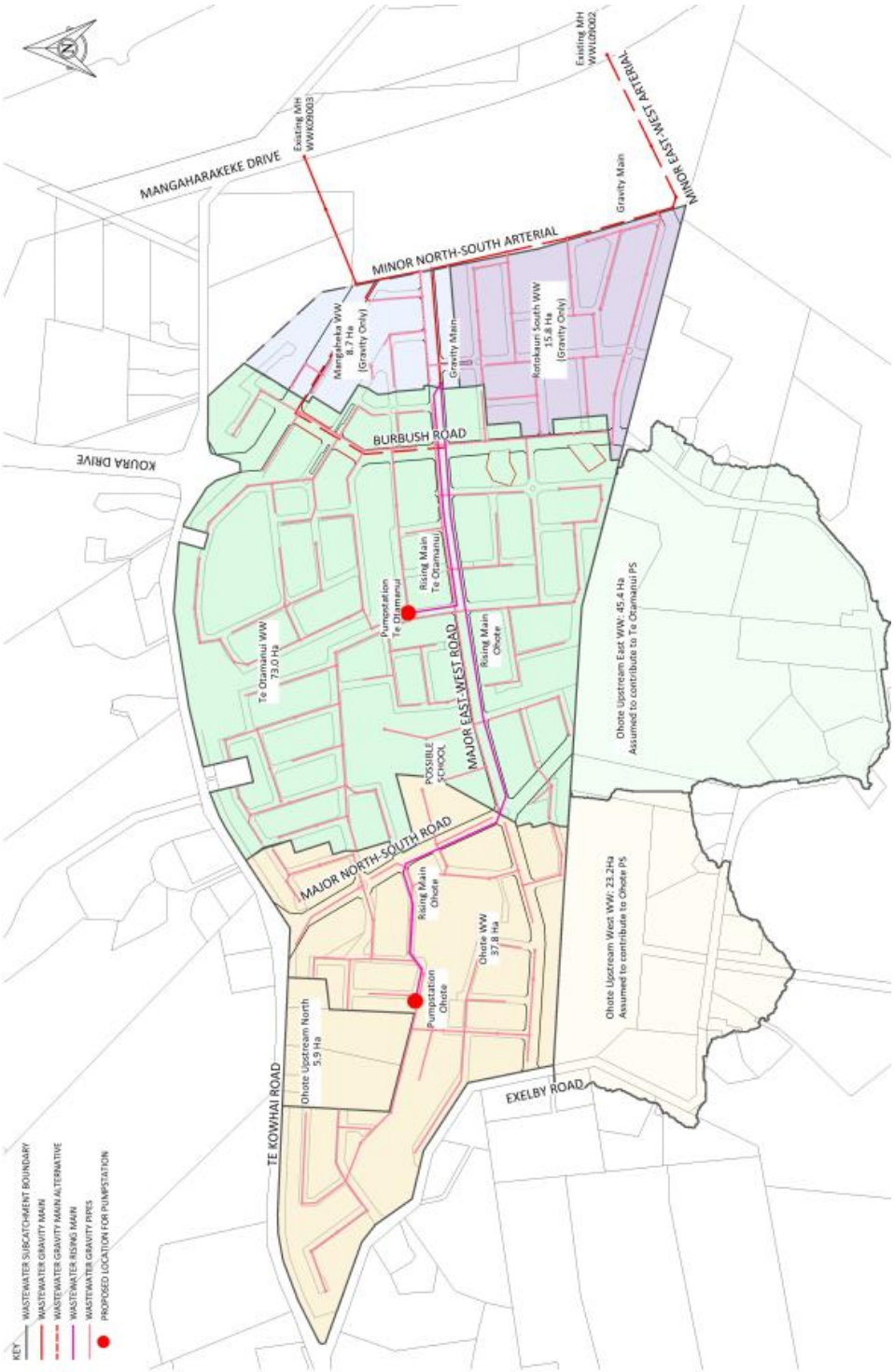


*Figure 3*

## 6. STORMWATER MANAGEMENT

6.1 As noted in the section 42A report, stormwater management within Rotokauri North has presented some significant challenges due to the flat topography, high water table and underlying soil conditions.

6.2 Attachment K to the ICMP and Section 8.0 of the SC-ICMP address the concept level design for the management of stormwater.

### Site context and catchments

6.3 Four stream catchments extend into the Rotokauri North site: Ohote Stream catchment (approx. 68ha), Te Otamanui Stream catchment (approx. 38ha), Mangaheka Stream catchment (approx. 19ha), and Rotokauri South Catchment (approx. 13ha). The natural drainage system has been extensively modified by agriculture, leaving a network of drains in place of streams. This modified drainage network within the site includes a reach of the Ohote Stream and a reach of a tributary of the Te Otamanui Stream. The proposed stormwater system for Rotokauri North endeavors reestablish these existing water ways in a manner that provides both stormwater management and environmental benefits.

6.4 The primary goals of the stormwater management system proposed for Rotokauri North include mitigation of downstream effects, flood control, treatment of stormwater runoff from developed areas, and safe conveyance of flow from upstream land. Through my extensive experience in this these works I also acknowledge that these works will have benefits in being able to provide for the restoration of stream habitat.

6.5 I address the key elements of the proposed stormwater management system further, as follows.

### Mitigation of downstream effects

6.6 Extended detention volume will be provided in accordance with the Waikato Regional Infrastructure Technical Specification.

### Flood control

6.7 *Flood control* – Adequate stormwater attenuation will be provided to control peak stormwater discharge, releasing 80% (70% for the Mangaheka Catchment) of the existing condition flow post development while accounting for climate change.

### Treatment of runoff

6.8 *Treatment of stormwater runoff from developed areas* – Stormwater quality treatment wetlands will provide primary water quality treatment. Wetland swales from the stormwater

network to the wetland and wetland swales from the wetland to the receiving environment will be utilised to create a treatment train, to the greatest extent possible.

**Conveyance of flow from upstream land**

6.9 *Safe conveyance of flow from upstream land* – Approximately 69ha of the Ohote Catchment drains into and through the Rotokauri North site. Greenway/flood corridors and stream extensions are provided as a discharge point for these upper Ohote sub-catchments.

6.10 *Restoration of functional stream habitat* – In addition to providing suitable corridors for stormwater management, the Green Spine corridors allow room to reestablish the Ohote Stream and the Te Otamanui tributary, with reasonable sinuosity and simulated natural geomorphology. The reestablished streams will be designed to function as natural streams with floodplains containing wetland and riparian habitat areas

## 7. SECTION 42A REPORT

7.1 At paragraph 4.11, the section 42A report identifies a number of issues with stormwater management. These are replicated from the Stormwater Technical Review undertaken by Mr Clarke (on behalf of HCC). I respond to each of these issues (with the request from the section 42A report shown in italics) as follows:

(a) *The ICMP Table 10 Drainage design criteria for Piped Drainage infrastructure should have the criteria "with road subsoil drainage connections above the 10 year HGL" or similar added to the end.* - I can confirm that this requested change has been made to the updated version of the ICMP, which is **attached** as **Appendix 1**.

(b) *The ICMP Table 10 Drainage design Criteria for Cross Culverts should add the word designation replaced with Rotokauri North Development Area.* - I can confirm that this requested change has been made to the updated version of the ICMP attached as Appendix 1.

(c) *The ICMP Table 13 should specify the following for the Rotokauri South Area – a. Interim storage of 12,000m$^3$/ha required for any development ahead of the Rotokauri South Green Corridor; b. Phosphorous removal of 70% TP*. – I can confirm that this requested change has been made to the updated version of the ICMP attached as Appendix 1.

(d) *Figure 2-8A Rotokauri North Structure Plan should have the indicative 'green spine' areas for the Mangaheka Catchments added to the Plan as are indicated in Stormwater Systems Report Figure 3-1*. - During stormwater expert conferencing, it was agreed that this matter does not need to be progressed. Refer to item 1.4, Appendix 1 of the Hamilton CC PPC 7 – JWS Stormwater and Planning 21 September

2021. This matter has also been addressed in the evidence of Mr Tollemache/Ms Fraser-Smith.

(e) *That cross sections and long sections of the main 'green spine' channels and their furthermost contributing catchments should be provided in the Stormwater Systems Report*. - Water levels have been provided in a table, conceptual long sections and conceptual cross sections have been included in the updated Stormwater Systems Report **attached** as **Appendix 2**.

(f) *That staging and trigger rules should provide for the design and consenting of all stormwater infrastructure and effects upstream and downstream of each area within the five sub-catchments. These evolving designs should be incorporated in sub-catchment ICMP iterations and approved by Council*. - During stormwater expert conferencing it was identified that the section 42A report did not contain the most recent Staging and Infrastructure Rule (Rule 3.6.A.4.2e) and a new version was displayed. I have reviewed the clauses and concur with the evidence and changes recommended with respect to these provisions by Mr Tollemache/Ms Fraser-Smith.

## 8. COMMENTS ON SUBMISSIONS

8.1 There are only two submissions which raise issues relating to three waters management, which it is necessary for me to comment on in any detail, as follows.

**Waikato Regional Council**

8.2 The Waikato Regional Council ("WRC") submission sought hydraulic neutrality of any stormwater management solution. This comment was part of a submission that pre-dated the changes to the stormwater management approach described in the *Rotokauri North Sub-Catchment ICMP Stormwater Systems Report* by BBO.

8.3 By way of response, I note that the existing streams and drainage within the four catchments, including the ICMP area, are extremely modified in relation to a natural system. There are existing downstream issues, including flooding, due to the modified hydrology. Achieving hydraulic neutrality would mean these issues remained. By contrast, the proposed stormwater management system is intended to provide mitigation for some of the existing issues, as well as the effects of the proposed urban development.

8.4 While these were not matters raised in the submission, I can also confirm that WRC's Regulatory Team was engaged early during the revision of the stormwater approach for Rotokauri North. I also confirm that it is intended that engagement will continue, as WRC is ultimately the regulator for stormwater discharge consenting.

**Mr Ruske**

8.5 The submission of Mr Ruske also raised specific concerns as to the integration of the ICMP with the existing Rotokauri ICMP, and ensuring provision for sites outside the PC7 area.

8.6 These matters have been addressed through the BBO revision to the three waters as outlined in Appendix J and K of the ICMP. The updated ICMP has been further refined in response to the matters raised in the section 42A report. A revised version of the *Sub-Catchment ICMP Stormwater System Report* is attached to my evidence (as Appendix 2), as further clarification.

## 9. PROPOSED PLAN PROVISIONS

9.1 I have reviewed the revised proposed plan provisions for PC7 as attached to the evidence of Mr Tollemache/Ms Fraser-Smith. I confirm that the proposed plan provisions (as revised) are well aligned with the proposed three waters infrastructure presented in the revised ICMP and its revised Appendices J and K completed by BBO.

9.2 In particular, I confirm that the proposed plan provisions (as revised) are appropriate for ensuring adequate management of stormwater and wastewater, and for enabling the required water supply capacity to service the proposed scale of development at Rotokauri North via PC7.

## 10. CONCLUSION

10.1 In summary, based on the assessment outlined above, I consider that:

(a) The extension of bulk water and wastewater services to Rotokauri North will ensure timely provision of this infrastructure for the PC7 area. It will also aid in allowing other development in the area to progress.

(b) The proposed stormwater management system, as revised by BBO, provides connectivity, managed stormwater quality, and flood control, while improving aquatic habitat and introducing native riparian habitat. Further, the design revisions to the ICMP are the result of a collaborative process with HCC and the TWWG, and are based on robust hydraulic and hydrologic modelling.

10.2 Accordingly, in my opinion the PC7 land can be adequately serviced with water supply, stormwater and wastewater management solutions. As such, I consider PC7 can be supported with respect to three waters management.

**Eugene Vodjanksy**
**24 September 2021**

**APPENDIX 1**

**Updated version of the Rotokauri North sub-catchment Integrated Catchment Management Plan (prepared by BBO)**

**September 2021**

**APPENDIX 2**

**Updated version of the Rotokauri North sub-catchment Integrated Catchment Management Plan Stormwater System Report (prepared by BBO) September 2021**