**BEFORE INDEPENDENT HEARING COMMISSIONERS**
**IN THE WAIKATO REGION**

**I MUA NGĀ KAIKŌMIHANA WHAKAWĀ MOTUHAKE**
**WAIKATO**

| | |
|---|---|
| **IN THE MATTER** | **of the Resource Management Act 1991** |
| **AND** | |
| **IN THE MATTER** | **of the hearing of submissions on Variation 3 Enabling Housing Supply ('V3') to the Proposed Waikato District Plan (PDP)** |

---

# STATEMENT OF PRIMARY EVIDENCE OF PHILIP THOMAS JAGGARD ON BEHALF OF KĀINGA ORA – HOMES AND COMMUNITIES

## (INFRASTRUCTURE AND STORMWATER)

## 4 JULY 2023

---

**Instructing solicitor**:
C E Kirman
Special Counsel
Kāinga Ora - Homes and Communities
PO Box 14594
Central Auckland 1051
E: claire.kirman@kaingaora.govt.nz

**Counsel Instructed:**
D A Allan / A K Devine
Ellis Gould Lawyers
PO Box 1509
Auckland 1140
E: dallan@ellisgould.co.nz /
adevine@ellisgould.co.nz

## 1. EXECUTIVE SUMMARY

1.1 My full name is Philip Thomas Jaggard. I am a Director/Infrastructure Specialist consultant at MPS Limited providing expert and technical advice, and direction on three waters infrastructure and effects. I have been engaged by Kāinga Ora-Homes and Communities (**"Kāinga Ora"**) to provide evidence addressing infrastructure capacity in support of its submissions to Variation 3 to the Waikato District Plan (**"Variation 3"**).

1.2 In summary, my evidence concludes that:

1.3 Focusing development into an existing and compact urban form has several benefits and can generally be viewed as positive as it reduces the overall area required to be serviced.

1.4 Variation 3 will not result in greater population growth in the district, but it will affect the location and type of dwellings in which the growth will be accommodated, and the urban form of the townships.

1.5 Regarding water and wastewater connections:

(a) I support Council's proposed approach to managing water and wastewater connections to the network, as Council or the network operator under the existing Bylaws, LGA and Building consent process, has an ability to decline connections to water and wastewater infrastructure, if no capacity is available.

1.6 Regarding stormwater:

(a) The redevelopment of a site under either, one, two or three dwellings per lot scenario can and will likely result in the same or similar stormwater discharges and effects as building and impervious coverage controls are based on percentages over the total site and are the same irrespective of the number of dwellings constructed.

(b) In addition, the Stormwater Bylaw and Regional Infrastructure Technical Standards (**"RITS"**) allows Council to

appropriately manage stormwater effects to ensure compliance with any discharge consents it holds for improved stormwater quality and flow attenuation outcomes from redevelopment of sites.

(c) Therefore, it can be concluded that redevelopment of sites into either two or three dwellings will more than likely have the same stormwater flows and contaminate loads in terms of environmental effects on the Waikato River.

1.7 Regarding potential flood displacement effects:

(a) Council is taking a piecemeal approach to managing flood risk with the proposed changes to the provisions in the plan (in that provisions are only being introduced to manage potential flood risks within the 'urban fringe' area, but not elsewhere in the Medium Density Residential Zone ("**MDRZ**")). In my view, if there are genuine concerns around flooding effects, Council should proceed with a separate plan change process to update their natural hazard section, supported by detailed modelling studies. This would mean that the provisions would apply consistently across the district, and that the range of responses available to the Council to address potential flood displacement effects would not be constrained by the scope of the Intensification Planning Instrument ("**IPI**") process.

(b) Therefore, I do not support the proposed rules as drafted, nor the use of statutory Overlays that require a plan change to modify flood hazard mapping.

(c) To address potential concerns around flood displacement effects occurring I recommend that a restricted discretionary rule is created to reflect that an assessment is required for building/s on a site impacted by flood plain (identified through a non-statutory layer).

(d) However, if this is outside the scope of Variation 3, I would recommend Council undertake a comprehensive Schedule 1

approach with amendments to the natural hazards chapter in conjunction with a full non-statutory flood mapping.

## 2. INTRODUCTION

2.1 My full name is Philip Thomas Jaggard, and I am a Director/Infrastructure Specialist consultant at MPS Limited providing expert and technical advice, and direction on three waters infrastructure and effects. My experience includes providing infrastructure advice, support and expert witness evidence on water, wastewater and stormwater servicing for brownfield and greenfield development proposals for both public and private entities across Auckland.

2.2 I hold a Bachelor of Science from the University of Auckland and have over 20 years' experience in the water sector, with the past nearly 7 years as a consultant at MPS Limited.

2.3 Prior to MPS Limited, I have been intimately involved in the strategy, planning and delivery of three waters infrastructure to improve levels of service and service growth in Auckland. I was the Wastewater Planning Manager at Watercare and more recently the Strategy and Resilience Manger, Healthy Waters, Auckland Council. During my time at both organisations, I provided input, and contributed to, the development of Auckland Council's Infrastructure Strategy and Land Release Programme.

2.4 My experience working for both public and private entities, gives me insight into how regulatory systems operate and the issues that arise when those systems don't function well.

2.5 Full details of my qualifications and relevant experience are at **Attachment A** to this evidence.

2.6 Kāinga Ora has requested my expert technical advice and opinion on the Variation 3 provisions relating to infrastructure and development, with my scope of work including:

(a) Reviewing the Variation 3 provisions.

(b) Reviewing Council evidence/documents.

(c) Reviewing submission points relating to infrastructure.

(d) Reviewing high level strategic evidence; particularly planning and economics.

(e) Participating in expert conferencing where required.

(f) Preparing expert three water infrastructure evidence.

**Code of Conduct**

2.7 Although this is a Council hearing, I have read the Environment Court's Code of Conduct for Expert Witnesses in its Practice Note 2023 and agree to comply with it. My qualifications as an expert are set out above. I confirm that the issues addressed in this statement of evidence are within my area of expertise and experience.

**Scope of Evidence**

2.8 The focus of my evidence will be on impact of development on infrastructure, particularly in brownfield areas, controls on connections and the level of intensification.

2.9 I have been asked to provide evidence in relation to:

(a) Water and wastewater

(b) Stormwater

(c) Flooding

2.10 My evidence will address the following topics in order:

(a) Background

(b) Benefits of Intensification

(c) Water and Wastewater

(d) Stormwater and Flood Hazard – Council’s Proposed Approach

(e) PDP Permitted Rules

(f) Stormwater General

(g) Stormwater Constraint and Flood Hazard Overlays

(h) Flood Freeboard

(i) High Risk Flood Areas

(j) Number of Lots, Lot Size, Building Coverage, Building Setbacks

2.11 Where appropriate and relevant, my evidence will reference and rely on the evidence by Katja Huls (Stantec), Susan Michelle Fairgray (Market Economics Limited), Mathew Telfer (Watercare), Keith Martin (Waikato District Council) and Andrew Boldero (Te Miro Water Consultants Limited ("**TMW**")).

2.12 My evidence will separate three waters infrastructure into the following topics:

(a) Water and Wastewater

(b) Stormwater

(c) Flooding

2.13 The separation of the topics is important, as:

(a) Potential effects on water and wastewater networks are predominantly influenced by the size of the connected population; while

(b) Potential effects in terms of stormwater infrastructure and the broader environment are predominantly based on total impervious surface coverage, from buildings, hard stand areas and roads and is independent of the number of dwellings and not directly related to the population served.

## 3. BACKGROUND

3.1 A key outcome of the National Policy Statement on Urban Development 2020 and the Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 2021 is to minimise barriers that constrain the ability to deliver housing development across public housing, affordable housing, affordable rental, and market housing.

3.2 The s42a report and evidence prepared by Waikato District Council, Variation 3 now includes a proposal for a Stormwater Constraint Overlay - High Risk, Stormwater Constraint Overlay – Medium Risk and Flood Hazard Overlay (**"the Stormwater and Flood Hazard Overlays"**) to limit the permitted development under the MDRS on the basis of flood hazard risks, particularly the potential effects associated with the displacement of floodwaters.

3.3 However, the mapping of the overlays is unclear, as it doesn't appear to distinguish between stormwater and flooding overlays, or between high/medium risk flooding areas.

## 4. BENEFITS OF INTENSIFICATION

4.1 The impact of a compact urban form through intensification and redevelopment on infrastructure requirements can be generally viewed as positive. By concentrating growth within existing serviced areas, a compact urban form and associated infrastructure investments can have positive effects such as the following:

(a) It allows authorities to capitalise on and optimise investment decisions relating to renewal and growth programmes, (i.e.: it provides an opportunity to benefit from programmes relating to the replacement of aging or failing assets).

(b) By minimising the extent of urban form, it can reduce adverse impacts on receiving environments.

(c) It minimises the area to be serviced.

(d) It minimises the linear length of infrastructure required.

(e) It reduces the carbon footprint of development.

(f) Redevelopment can reduce water demand through water efficient appliances and plumbing fittings.

(g) Redevelopment can progressively reduce inflow and infiltration to the wastewater system from private drainage by replacing older earthenware pipes with PVC.

(h) It can provide greater security of supply for water infrastructure through duplication and pipe upgrades to service growth.

(i) It can reduce existing wastewater overflows.

(j) It can reduce flooding hazards in existing developed areas.

(k) It can reduce contaminants in runoff from existing serviced areas with improved water quality outcomes.

## 5. WATER AND WASTEWATER

5.1 New development is permitted under the existing PDP where water and wastewater servicing connections are available (WWS-R2 and WWS-R10).

5.2 Though Variation 3 may enable significant intensification, the plan change will not itself generate additional demand for housing in the Waikato District. Variation 3 governs where and in what built forms that demand might be accommodated, with the market ultimately deciding where to build. That is, Variation 3 will not result in greater population growth in the district, but it will affect the location and type of dwellings in which the growth will be accommodated, and the urban form of the townships.

5.3 It is noted in Ms Huls evidence that "*While the technical review of the water and wastewater networks identified potential constraints, particularly in the local network, the preferred approach is to revise internal processes within council to manage connections to the networks due to the low number of developments that would not be*

*assessed under existing rules in the PDP, the ability to refuse connections as the network operator and use the enforcement powers under council bylaws if enforcement action is required."*

5.4 I support the above approach, and this is supported by all experts who attended the joint expert conferencing, with the exception of planner Melissa McGrath on behalf of Pookeno Village Holdings.

5.5 Council's approach is both pragmatic and efficient for delivering housing outcomes and managing any potential minor effects from redevelopment.

## 6. STORMWATER AND FLOOD HAZARDS – COUNCIL'S PROPOSED APPROACH

6.1 I understand that as a result of the TMW report by Mr Boldero, Ms Huls and Ms Hill propose the following amendments as part of Variation 3 to assist with stormwater and flood hazard management:

(a) In the high-risk flood areas identified by TMW, two or more residential units will be a non-complying activity;

(b) In the flood areas identified (but outside the high-risk areas), the following standards will apply:

(i) Only one residential unit will be permitted, with two or more requiring resource consent;

(ii) All residential units to comply with a minimum freeboard requirement of 0.5m above the 1% AEP;

(iii) Building coverage will be limited to 40%;

(iv) Setbacks are proposed to be 3m for frontage and 1.5m for all other boundaries; and

(v) Minimum lot size of 450m$^2$.

6.2 In addition, Council proposes to maintain setbacks from water bodies for those sites previously zoned General Residential under MRZ2-S13.

6.3 My understanding is that these rules will only apply in areas which were previously identified as being subject to the 'urban fringe'

qualifying matter. That is, there may be flood areas (high risk or otherwise) which have been identified but for which there will be no change to the management regime due to the *Waikanae*[1] decision which held that an IPI cannot lawfully disenable current development rights in a district plan. As noted in paragraph 3.3 above, the mapping that identifies the areas subject to these controls is unclear, as it doesn't appear to distinguish between stormwater and flooding overlays, or between high/medium risk flooding areas.

6.4 The provisions discussed through paragraphs 6.1 b) and 6.2 above essentially maintain the General Residential Zone ("**GRZ**") standards of one residential unit (with a minor residential unit if the site size allows), setbacks (yards), building coverage and minimum lot size to sites which are:

(a) located within the newly identified Stormwater Constraints Overlay and Flood Hazard Overlay;

(b) now zoned Medium Residential Zone ("**MDRZ**") through Variation 3, as a result of the removal of the Urban Fringe Qualifying Matter.

6.5 Sites already zoned Medium Density in the existing PDP will not have any such restrictions, even though they may be impacted by flooding.

6.6 Thus, two properties in the same zone and both impacted by flooding may be treated differently under the future PDP, for the simple reason that they had different zoning prior to Variation 3. For the reasons discussed in more detail in Sections 9 to 12 of this statement, I consider Council should proceed with a separate plan change to update the natural hazard section. This would ensure a consistent approach is applied across zones and mean that Council is not constrained by the scope of the IPI in what provisions it can introduce.

6.7 I note that the various reports, PDP, and plans use several slightly different names or terminology but expect this can be clarified at the Stormwater expert conferencing planned to occur on 11 July 2023.

---

[1] [2023] NZEnvC 056 Waikanae Land Company Limited v Heritage New Zealand Pouhere Taonga

6.8 For example, there are subtle differences in the wording of the Variation 3 rules between the s42A report Appendix 2 (dated 19 June 2023) and Katja Huls' S32AA report (dated 20 June 2023). At this stage, it is unclear which is Council's preferred revision to the rules and plans.

6.9 Further, the mapping of the Stormwater and Flood Hazard Overlays does not appear to distinguish between stormwater and flooding overlays, or between high/medium risk flooding. Nor is it apparent where the location of new high-risk flood areas are in relation to the existing PDP high-risk flood areas, as no comparison map is provided.

## 7. PDP PERMITTED RULES

7.1 In relation to stormwater and hazard management, the approach in the PDP is to manage stormwater at the development stage with a permitted activity rule with several standards. The technical review from TMW has indicated that assessing compliance with several rules (e.g. WWS-R1) as a permitted activity is difficult and requires an applicant to have engaged the appropriate experts.

7.2 I agree that the permitted activity rules could be read as challenging and there is a potential gap in relation to flood displacement effects within the exiting PDP. However, I also understand there are ongoing appeals to the PDP relating to these rules. It is unclear if modifications to existing permitted rules and under appeal are outside the scope of Variation 3 given the recent Waikanae decision[2].

7.3 If there is limited scope to amend the existing permitted rules through Variation 3, then I would recommend Council undertake a plan change to review and update hazard district wide rules as appropriate.

## 8. STORMWATER GENERAL

8.1 Council is proposing to limit building coverage to 40% to maintain setbacks from water bodies in part to address stormwater effects within the proposed Stormwater and Flooding Constraint Overlays.

---

[2] [2023] NZEnvC 056 Waikanae Land Company Limited v Heritage New Zealand Pouhere Taonga

8.2 The stormwater runoff effects, flows and volumes from developments are likely to be similar or the same for sites with 40%, 45% or 50% building coverage scenarios, as the maximum impervious coverage for all scenarios is 70%.

8.3 For stormwater runoff volumes and flows, it is the total impervious coverage that is important, not the split between hard stand areas and building coverage. As the maximum impervious coverage is 70% for all zones, the rules do not produce a change in stormwater runoff, flows and volumes.

8.4 I note that the Stormwater Bylaw and RITS document assists in managing the effects of stormwater discharges and effects on the receiving environment from intensifying development. For example, under the RITS, detention is required, limiting the post development 100-year ARI event flow rates to 80% of the pre-development 100-year ARI event flow rates where there is identified flooding issues downstream, which is common in the Waikato District.

8.5 However, for water quality discharges, the inverse is true. The greater the building coverage, the lower the potential generation of water quality contaminates.

8.6 ARC's study (Kingett Mitchell Ltd, 2004) into roof runoff quality, noted that many new roofing materials were found to contribute little contamination and were relatively unreactive. The shift to roofing materials with improved durability such as colorsteel has made a substantial difference to the quality of roof run-off, and hence reduced contribution to stormwater contaminant loads.

8.7 Runoff from private trafficked impervious surfaces (e.g., driveways) is likely to have low concentrations of heavy metals and fine sediments compared to roads due to reduced traffic volumes, but higher concentrations than roof runoff due to risks around activities that may occur e.g. oil leaks, people washing or working on their car.

8.8 The Waikato Stormwater management guideline (Updated version May 2020) states: "A*s can be seen from the table above [Table 6-9], concrete tiles, colour steel and gravel have low contaminant*

*discharge potential and hence it is considered that runoff from these surfaces does not require water quality treatment. All other roof types, other than green roofs, should consider water quality treatment for roof runoff.*"

8.9 Therefore, I do not support the proposed limitation of building coverage to 40% in the MRZ on the basis of managing stormwater effects.

## 9. STORMWATER CONSTRAINT AND FLOOD HAZARD OVERLAYS

9.1 Flooding is a natural process, and flood plains are part of the natural water system. Flooding only becomes a hazard when people, property and development are located within flood plains; overland flow paths (areas along which flood waters flow); and areas that are susceptible to flooding when drainage networks are blocked (flood prone areas).

9.2 Historically, residential development has steadily intruded into flood plains as the urban areas intensified, and people sought to make use of what was perceived to be "spare land".

9.3 In addition, another source of increased flooding, is where enabling extensive development upstream of what were originally flood plains has converted that lower lying land into flood plains, due to increased runoff.

9.4 Risks from flood events can be underestimated by councils, consultants, developers, landowners, and home buyers, while over time, as urban areas develop and impermeable surfaces increase, flood events increase in severity.

*Mapping of the Overlays*

9.5 I support appropriate rules and controls within plans to manage the risks associated with development near or adjacent to flood waters. However, rules and controls need to recognise that information and knowledge of flooding continually evolves and improves with time, particularly due to the development of more sophisticated and

complex modelling tools, asset data collection and the changing predications of climate change.

9.6 However, the proposed Stormwater and Flooding Constraint Overlays are a statutory overlay within the Plan and any changes to it would require a plan change. Plan changes are not a simple exercise, take a considerable amount of time and resources, nor are they a regular occurrence. I consider adopting a non-statutory approach to convey information about flood and coastal hazards which are likely to change to be the preferable approach because:

(a) Experience tells us that flood risk data and modelling information (extents, depths, flows and velocities) is dynamic and will continue to change and evolve over time. These changes can occur within a matter of a 2 to 3 years, as new and more detailed models are developed.

(b) If the proposed Stormwater and Flooding Constraint Overlays are included in the Variation 3, then information effectively becomes a "snapshot in time". Whereas, if the information is included as part of a non-statutory layer, it can be updated regularly and quickly. Out of date information will cause confusion as well as result in additional transaction costs for councils and applicants and may lead to unintended consequences such as unmanaged flood effects because of out-of-date mapping.

(c) For example, there is extensive flooding shown on the largely undeveloped (MDRZ zoned) large lot parcels running along Starr Road on Stormwater and Flooding Constraint Overlay – Ngaaruawaahia plan (as shown in Figure 1 below).


**Figure 1**: Stormwater and Flooding Constraint Overlay - Ngaaruawaahia

9.7 The land along Starr Road is zoned MDRZ2 but is generally undeveloped, flat and lacks a piped stormwater system. In order for this area to be developed under the MDRZ2 it is likely that a piped stormwater network would need to be constructed (including earthworks to create developable platforms). This is relevant because:

(a) The modelling on which the Stormwater and Flooding Constraint Overlay is based assumes maximum probable development has occurred without the subsequent stormwater infrastructure being built.

(b) The works to develop the sites would likely change or remove the identified flood hazard shown on the plan above and would create lots for residential development. However, without a subsequent Plan Change, each new lot created would still be encumbered by the Stormwater and Flooding Constraints Overlays, even though the flood hazard may

never have existed or would no longer exist on the lots created.

9.8 The flood hazard modelling undertaken by Council provides a level of confidence that a potential hazard or issue exists at a Catchment level, but the results are not infallible. A more localised, detailed, or site-specific flood hazard assessment may produce very different results.

9.9 Mr Boldero's evidence recognises that flood hazard information is subject to change, and he recommends "*that the Council consider the following outside of Variation 3:*

(a) *Regular updates to the flood hazard maps (ideally without having to undertake a plan change) would be advantageous as this would enable the maps to be updated when new data (LIDAR, hydrological, climate change, routing/network) is available; "*

9.10 In terms of the accuracy of the modelling undertaken (which is a particularly relevant consideration given the overlay is proposed to be a statutory rather than non-statutory layer):

(a) The modelling undertaken is considered to be a high-level modelling exercise, as Mr Boldero evidence states that the assessment was undertaken using a Rapid Flood Hazard Model ("**RFHM**") with some sections of piped stormwater network added.

(b) As noted in Table 1 of the Section 32AA report "*The modelled flood plains are based on rapid flood hazard models which are relatively coarse. The degree of effect on individual properties will require site specific modelling and evaluation.*"

(c) It is understood that work is still underway on refining the models and a peer review still to be undertaken. As noted in Mr Boldero's evidence "*Additional refinement is still being undertaken on the flood models. This refinement includes:*

*infilling of artificial ponding areas caused by the LIDAR processing, additional checks on the pipe network utilised, and analysis of 'high risk' flood hazards. This work is currently being undertaken and expected to be completed by the end of July 2023*".

(d) Mr Boldero's report recommends that "*Additional routing is recommended on the flood hazard maps to ensure isolated ponding areas due to the LIDAR ground surface processing are not included as flood risk areas.*"

(e) RFHM assessments have been found to be a valuable tool to provide an indication of where modelling efforts should be concentrated and where more detail may be required. However, RFHM assessments may provide a conservative estimate of flooding due to the lack of or limited inclusion of piped network being included in the model.

(f) For example, there is flooding identified on very recently developed sections within the northern part of Pookeno as shown in Figure 2 below. Given the recent construction of houses (with slab on grade foundations) and accompanied by a new stormwater system, I find it surprising that several essentially brand-new houses would potentially be inundated by the 100-year flood plain and are included in the Overlay's.


**Figure 2**: Stormwater and Flooding Constraint Overlay – Pookeno

9.11 Landowners included in the Overlay may now find themselves in a difficult position whereby the information is shown on plans is inaccurate but the cost to challenge (and change) this information is potentially significant[3]. If the information was instead included in a non-statutory layer, any inaccuracies could be easily remedied.

9.12 I therefore recommend that if a Stormwater Constraints Overlay and Flood Hazard Overlay is to be adopted, that the associated mapping be included as a non-statutory layer and reference is made to flooding information via advice notes, where appropriate.

9.13 I understand this will likely require several changes to Council's proposed drafting of the rules.

9.14 I recommend that the specific detail of how flood risks and hazards are managed should be reconsidered following expert conferencing on stormwater scheduled for the 11th of July 2023.

[3] For example a landowner may be able to get a flood hazard removed from the LIM due to an error or over prediction in the modelling, but the process to remove it from the PDP would require a plan change.

## 10. FLOOD FREEBOARD

10.1 I would support an amendment to NH-R1 (irrespective of flood hazard) that ensures all habitable floors in residential units comply with a minimum freeboard requirement of 0.5m above the 1% AEP. This would align with the existing level of services provisions in the WRC guidelines and the RITS.

10.2 However, it should be noted that commercial/industrial and non-habitable buildings (e.g. detached garages) have a lower free board requirement in the RITS. This topic should be explored further at expert conferencing on aligning the PDP and RITS.

## 11. HIGH RISK FLOOD AREAS

11.1 The proposed addition of MRZ2-S1a Residential Unit (non-complying) to restrict the construction of two or more residential units in high-risk flood areas in my opinion is a duplication of the non-complying activity NH-R20 (Construction of a new building or additions to an existing building) which already applies to land located within the 'High Risk Flood Areas' that are currently identified within the plan.

11.2 However, it is not clear to me at time of writing this evidence if Council is relying on the existing High Risk Flood Overlay in the PDP or will create a new one based on the most recent modelling. I expect this can be clarified at expert conferencing. If it is the later approach, I do not support and cannot see any justification for a different approach being taken to flood hazards currently identified within the plan vs. flood hazards identified through Variation 3.

11.3 The Variation 3 approach proposes to manage flood risks by restricting the number of residential units in high-risk areas rather than restricting the construction of a new building or alterations/additions to an existing building within a flood area. In my view, the number of dwellings on a site is not the key criteria for managing the flood risk. Rather, it is the location of the building/s in relation to the high-risk flood area and whether safe egress and entry can be provided.

11.4 In my opinion, high-risk flood hazards are more appropriately managed through district wide rules, as per the current PDP. However, reference to high-risk flood areas should be identified via a non-statutory layer for the reasons as I outlined in Section 8 above.

11.5 Therefore, I recommend that the proposed rule MRZ2-S1a is removed, and Council adopt a non-statutory approach to flood modelling. In addition, I recommend that advice notes are added to the plan referring to published non-statutory flood hazard maps in the proposed plan or other sources as deemed appropriate.

11.6 However, I would support a review of the definition of high-risk flood areas as recommended by Mr Boldero in the TMW report[4].

## 12. NUMBER OF LOTS, LOT SIZE, BUILDING COVERAGE, BUILDING SETBACKS

12.1 Council's proposed changes to Variation 3 includes larger set back requirements and smaller building footprints in the MRZ for sites located within the Stormwater and Flood Constraints Overlay. The proposed rules also limit the number of houses to one dwelling per site, with provision for a minor dwelling if it complies with other requirements. As noted above, these rules only apply to lots previously zoned GRZ (i.e.: to those areas identified within the 'urban fringe' in Variation 3 as notified).

12.2 I do not consider the Council's proposed approach to be the best way in which to manage potential flood risk and flood displacement effects.

12.3 There is no guarantee on the location of any flood plain in relation to the boundaries of a site and the siting of a building/s on a lot. For example, there is a risk that the front set back rule of 3m pushes houses further back into a flood plain, creating a greater displacement effect.

---

[4] Where he recommends updating the High Risk Flood areas utilising depth x velocity components to more accurately represent high risk areas.

12.4 New buildings foundations are generally constructed either slab on grade or on timber piles with exterior underfloor cladding. Therefore, a building constructed within a flood plain/secondary flow path may cause an obstruction and flood displacement effects.

12.5 However, it is not 100% certain that extra building coverage on a site will result in flood displacement effects, or the degree to which any flood displacement effect would occur (including cumulative effects), as it will be very site specific.

12.6 For example, if the flood depth is relatively deep, then a building constructed in a flood plain is likely to be constructed on piles (due to costs), minimising the amount of flood displacing effects. While a slab on grade foundations is more likely on sites with shallow flooding, so the displacement volume will likely be variable in terms of its effects.

12.7 The current PDP appears to have fairly permissive rules for flood displacement, whereby it has been generally permitted to construct in flood management areas. For example, a garage up to $40m^2$ is permitted to be located in a Flood Plain Management area and Flood Ponding area across all zones.

12.8 While increases in impervious coverage has the potential to increase flooding effects, there is not a direct relationship between predicted increases in impervious coverage and the number of dwellings on a site.

12.9 The number of dwellings does not necessarily affect the total building coverage within a lot, as coverage is controlled via a percentage rule which applies irrespective of the number of dwellings on the site. That is, a development of one, two or three houses on a lot could cover the same land area, as new developments attempt to maximise the building and site coverage rules. For example, a single large house may cover the same land area as two or three smaller dwellings that may or may not share an adjoining wall.

12.10 In addition, in my opinion there is no justification for the difference in setbacks from the water bodies for houses in the same zone where

they are both affected by flooding, but where one will be included in the Stormwater and Flooding Constraints Overlay, while the other is not.

12.11 In summary, I do not consider the Council's proposed approach to control the number of lots, lot size, building coverage and setbacks in order to address potential flood displacement effects (but only within the MDRZ2 which was previously identified as being within the 'urban fringe') to be the best approach. Rather, it appears driven by the limitations of the existing PDP to manage flood displacement effects and the recent Waikanae decision[5].

12.12 In my opinion, Council is adding complexity to the plan and is not applying a consistent approach to managing flood risks and displacement effects within the MRDZ2 (in that potential flood displacement effects are only managed where the site was previously within the 'urban fringe' overlay).

12.13 The proposed approach is piecemeal and is not consistent in my opinion with good practice. Therefore, I recommend that the above rules are removed.

12.14 If Council has concern around flood risk and flood displacement effects, it should undertake a plan change, to address any shortfalls in the PDP at a district wide level. This approach would provide a consistent rule framework to developments.

12.15 In addition, I make the following observations:

(a) the flood modelling to date may be viewed as conservative and has been undertaken at a relatively coarse level (by their own definition);

(b) there are no controls proposed for development located outside the 'urban fringe' area, even where it is also located within a flood hazard.

---

[5] [2023] NZEnvC 056 Waikanae Land Company Limited v Heritage New Zealand Pouhere Taonga

12.16 I would support that a restricted discretionary consent should be required through a District Wide rule, for dwellings (irrespective of number) constructed within a flood plain (identified via a non-statutory layer). This is to ensure an appropriate assessment is undertaken on building within a flood plain.

12.17 The effects of building or obstruction on the flood hazard can be a matter of discretion and will be assessed and managed appropriately through the restricted discretionary consent process.

12.18 If an appropriate, fit for purpose rule cannot be included in Variation 3 (due to the Waikanae decision), then I would recommend that Council undertake a separate plan change to appropriately address flood hazard risks and displacement effects across the District.

**Philip Jaggard**
**4 July 2023**

**Attachment A - CV**

## Experience Summary

- **MPS Limited:** Director/Project Management/Infrastructure Planning, 2016 to present.
- **St Francis Primary School:** Board of Trustees – Parent Representative, June 2019 to present; Co-Chair 2022 to present.
- **Auckland Council:** Stormwater Strategy and Resilience Manager, 2013 to 2016.
- **Te Motu a Hiaroa Governance Trust (Governance Trust) and Te Motu a Hiaroa Charitable Trust (Island Trust):** Trustee and Secretary, 2011 – 2014
- **Watercare Services Limited:** Wastewater Planning Manager, 2008 to 2014.
- **North Shore City Council:** Wastewater Network Planner, 2006 to 2008
- **Sinclair Knight Merz (SKM):** Project Engineer / Hydraulic Modeller, Hydrogeologist, 2000 to 2006 (excluding September 2004 – January 2005)
- **Connell Wagner:** Water Engineer September 2004 – January 2005

## Education and Qualifications

- **Bachelor of Science**, Geography and Geology, University of Auckland.
- **Post Graduate Diploma of Science**, (Partially complete), University of Auckland.
- **Engineering Technology Papers,** Open Polytechnic
- **Better Business Cases** – Foundation – APMG International
- **People Leaders** – Auckland Council
- **Strategic Planning, Motivation and Leadership** – University of Auckland Short Courses
- **Project Management Level 1 & 2** - SKM
- **Understanding NZS3910 Conditions of Contract**
- **Urban Drainage Modelling**

## Personal Details


| | |
|---|---|
| Nationality: | New Zealand. |
| Date of Birth: | February 1975. |
| Contact Address: | 32 Buxton Street<br>Point Chevalier<br>Auckland 1022 |
| Phone | +64 21 524473 |
| Email: | phil@mps.net.nz |


I am a highly motivated and outcomes focused individual with a proven track record in leading and developing teams, to successfully deliver asset management programmes and infrastructure projects, within the public and private sector. My leadership and communication skills, infrastructure expertise and knowledge, financial and risk acumen, ability to problem solve, think strategically, and bring new ideas is invaluable to organisation's seeking to deliver high quality infrastructure programmes and projects on time and within budget.

My experience extends from strategic planning and preparing business cases through to project set up, delivery and implementation. I have technical expertise and knowledge that provides me with a unique insight into ensuring projects are scoped and delivered successfully. In addition, I have provided expert witness evidence on water, wastewater and stormwater servicing for brownfield and greenfield development proposals for public and private entities. Prior to joining MPS, I was the Stormwater Strategy and Resilience Manager at Auckland Council and spent six years as the Wastewater Planning Manager at Watercare.

## Recent Professional Experience

**Carrington Development: Ministry of Housing and Urban Development – Infrastructure Advisor – MPS Limited**

Land within the Wairaka Precinct, Auckland was transferred via legislation to the Crown in 2018 and is now under the control of the Ministry of Housing and Urban Development (HUD). The Crown, through HUD, in partnership with Ngā Mana Whenua o Tāmaki Makaurau, propose to develop an inclusive sustainable community on the Crown land. The site is a significant brownfield residential development (approximately

63 Ha) with up to 6,000 residential dwellings proposed. MPS has been providing infrastructure advice and support to HUD on development plans, infrastructure upgrade requirements, shovel-ready projects, fast track consenting, resource consents, design, and engineering approvals. In addition, MPS prepared 4eh Stormwater Management Plan for the Wairaka Precinct and assisted HUD tender and appoint the lead designer for the proposed Backbone Infrastructure works including identifying the shovel ready projects that are underway.

**Wellington Water Limited – Seconded Engineer – MPS Limited**
Providing expert technical engineering and infrastructure advice to Wellington Water's Network Engineering Team. Projects include review of the Very High Critical Asset Renewal Programme, Identification, and investigation of critical projects for implementation, Stormwater Prioritisation, and preparation of Activity Briefs for project implementation.

**State Highway 22 Urbanisation: Waka Kotahi - Stormwater Design Lead – Subconsultant to Aecom /Beca**
The upgrade of State Highway 22 (SH22) is being advanced as part of the New Zealand Upgrade Programme (NZUP) South Auckland package to improve safety and support growth in Drury West, South Auckland. It will provide growing communities with more travel options that help people get where they want to go safely. graded road will consist of four lanes of traffic (2 in each direction), cycle lanes on both sides, pedestrian footpaths, and upgraded traffic intersections. Phil is currently the Stormwater Design Lead on the Pre-implementation phase of the project that includes confirming the concept design, design standards and staging and timing of construction. In addition, it includes understanding how major land-use development project will interface with the corridor.

**Land Development Projects: Multiple clients – Infrastructure Specialist – MPS Limited**
Provided expert technical three waters infrastructure advice on multiple large scale land development projects for a variety of public and private developer clients. Developments included commercial, industrial, and residential developments in both greenfield and brownfield areas across Auckland. Projects include working alongside Auckland Council's Development Project Office to identify three water upgrade projects and assisting in the preparation of Precinct Infrastructure Master Plans. In addition, Phil has provided technical input into applications for fast-track consenting, Infrastructure Acceleration Funding, developer agreements, resource consents and engineering approvals. On multiple projects, I was appointed to resolve infrastructure, resource consent and engineering issues for clients with Auckland Council and/or Watercare to unlock stalled projects.

**Te Auaunga/Oakley Creek Framework Stormwater Management Plan (SMP): Kāinga Ora/Piratahi – Subconsultant to Piratahi**
Phil was appointed to lead the Green Infrastructure Workstream of the Te Auaunga/Oakley Creek Framework SMP project. Phil's role was to provide expert stormwater technical advice and co-ordinate outputs from the ecology, hydrogeology, water quality, Iwi, and stakeholder engagement teams to develop the Best Practical Option (BPO) for stormwater management within the Te Auaunga/Oakley Creek catchment that included Kāinga Ora's Roskill Precinct.

**Takapuna Beach Water Quality Improvement Project: Auckland Council - Project Manager and Technical Expert**
Through Auckland Council's Safeswim programme and website, the public is informed about health risks and beach water quality ratings associated with contact recreation at Takapuna Beach. The overall objective of the Takapuna Beach Water Quality Improvement Programme was to investigate and identify the source/s of recreational water quality issues at Takapuna Beach and evaluate and recommend solutions to improve water quality. My role was the Project Manager for the overall programme of work, and the technical expert responsible for preparing the Options Report.

**Rapaki Decommissioning and Heritage Recovery Project: Regional Facilities Limited, New Zealand Maritime Museum (NZMM) and Panuku – Project Manager**
I was appointed to find a solution to relocate the Rapaki and project manage the relocation project to allow the Americas' Cup Hobson Wharf extension construction works to proceed in a timely manner. I undertook a review of all existing documentation and information on the Rapaki and developed an assessment of options, information documents for the relevant Board and senior management teams. In addition, I completed the business case for approval for the preferred option to decommission the ship and recover

heritage items for preservation. Due to the tight timeframes for the America's Cup works to begin (weeks), I worked collaboratively with the limited number of available suppliers to develop a suitable contract and safety plans to decommission the Rapaki and recover the heritage items during December and over the Christmas break.

Due to the condition of the Rapaki, there were several significant risks that required oversight and careful management particularly due to the evidence of significant corrosion. Key risks identified were asbestos removal; failure of the crane superstructure; hull breach or failure; failure of propellers seals and failure to recover heritage items for preservation.

**Weiti Villages Plan Change Variation: Williams Land (Weiti Development LP) – Project Manager**
The 860ha Weiti site is situated on the coast between Okura and Stillwater just north of Auckland. The initial focus is the delivery of the 150-lot (Sub-precinct A) private residential development of Weiti Bay, with later stages being the development of two Villages (Sub Precinct B) including some mixed use. The Weiti Sub-Precinct B - Village area is zoned for a maximum of 400 residential lots and 100,000 m2 Gross Floor Area (GFA) mixed use in the Auckland Unitary Plan's Weiti Precinct provisions. Auckland Council has agreed to accept a public notification of a Private Plan Change application to enable up to 1,200 dwellings in total in Weiti Sub-precincts A (150 lots) and B (1,050), including a minor amendment to the boundary of Sub-precinct B.

My role was the project manager for the Plan Change variation, including managing various consultants and contractors, in preparing the application and supporting technical documentation.

**Weiti Subdivision: Williams Land (Weiti Development LP) – Design Manager**
I was the design manager for the $10 million civil contract works for the construction of over 120,000m$^3$ cut and fill, 1.3 km of new public access road along the Penlink designation, including an upgraded intersection with East Coast Road. My role for the project was manging various consultants, adjacent landowners, and contractors, including the design, consents, and construction, managing service relocations, clearance of unexploded ordnances from a historic World War 2 firing range and all farm improvement works required as part of the Auckland Transport's agreement with the Hugh Green Group.

Close liaison with Auckland Council on the resource consents was required, given the tight timeframes, consents were obtained on time to allow construction and the sediment control works to begin prior to the earth work season. In addition, I managed the preparation and submission of all 223 and 224c documentation, lodgement of easements and issuing of titles for the 150-lot development.

**Project CANOPy and Western Isthmus Water Quality Improvement Programme: Auckland Council – Project Manager and Technical Expert.**
Project CANOPy was initiated in January 2017 in response to long-standing concerns about the ongoing water quality issues in the western part of Auckland's inner city. CANOPy stands for Central Auckland Network Optimisation Programme and was undertaken jointly by Watercare Services (Watercare) and Auckland Council Healthy Waters (Healthy Waters). These projects were to develop an affordable, timely and integrated infrastructure programme for stormwater and wastewater services.

I was responsible for the project management of numerous consultants to deliver 11 catchment reports, provided expert technical advice and collaborated with others on the Strategic and Summary reports to the Project Governance Group. Upon completion of Project CANOPy, I undertook the development of the Western Isthmus Water Quality Improvement Programme for inclusion in the 2018 Long Term Plan and subsequent investigation requirements.

**Unitec Carrington Campus Re-development: Unitec/Wairaka Land Company – Infrastructure Technical Expert**
Unitec planned to consolidate some 177 existing buildings spread over 53 hectares into a purpose-built education core on only 10 to 15 hectares, releasing some 40 hectares for residential and commercial development. I was involved in reviewing and updating the three waters master plan for the whole site. In updating the Master Plan, I undertook consultation with Auckland Council and Watercare Services Limited, prepared a gap analysis, assessed stormwater and wastewater capacities, managed the CCTV contractor, surveyor and consultants developing the water supply model for the site. In addition, I undertook the additional tasks and investigations:

- Project Management of the Stormwater Management Plan and Modelling
- Infrastructure Report for Boundary Rationalisation Subdivision Consent
- Infrastructure Servicing Report for the proposed Business Park Redevelopment.

**Stormwater Strategy and Resilience Manager: Auckland Council.**
Responsible for the strategic vision and direction of stormwater services at Auckland Council, reporting directly to the Stormwater Manager. Responsibilities include: preparing the Asset Management Plan, financial reporting of the Business unit, preparation of annual $75 million capital works budget, review and approval of business cases, programming and prioritisation of the 30-year capital works programme, resource management team, resource consents, development of infrastructure funding agreements with developers, communication with stakeholders, Local Boards and Councillors, provide governance on difficult and complex projects and technical issues, and management and development of nineteen staff members, including four managers. I also filled the role as Acting Stormwater Manger during the absence of the Stormwater Manager.

I have a good understanding of stormwater technical issues as well as strong working relationship with key people within Auckland Council. In addition, I was appointed to lead the Takapuna Spatial Priority Area project within Council, and I coordinated the LGNZ Three Waters data and survey information for the Auckland and Northland regions. As the Takapuna Spatial Priority Area lead, I was able to identify and obtain funding approval for the first Spatial Priority Area project within Council.

**Te Motu a Hiaroa Governance Trust (Governance Trust) and Te Motu a Hiaroa Charitable Trust (Island Trust): Trustee and Secretary: Trustee and Secretary, 2011-2014.**
Managed the formation of the two Puketutu Island (Te Motu a Hiaroa) charitable trusts as part of the settlement agreement between Watercare Services Limited, Auckland Council and three iwi entities, being Waikato Tainui, Te Kawerau and Makaurau Marae. In addition, I served as inaugural trustee and secretary on both trusts.

**Wastewater Planning Manager: Watercare Services Limited.**
Overall responsibility for the planning of Auckland's wastewater infrastructure to meet the operational and strategic needs of the company. Responsibilities include preparation of the annual $100+ million and 20 year $2.5+ billion capital works Asset Management Plan, management of the $4 million planning budget, renewal, growth and demand planning, preparation of business cases including risk and financial evaluations for new capital projects, internal and external communication with stakeholders, expert engineering input to ensure project deliverables/objectives are met, management and development of seven staff members.

Highlights include obtaining Board and/or Management approval for over 300 capital works projects with a combined value of more than $2.0 billion; integration and reprioritisation of Auckland's wastewater planning and capital works programme in 2010, with identified savings of approximately $1 billion (25% saving) over 20 years; successful negotiation and conclusion of the Puketutu Island Rehabilitation Settlement Agreements. I have an excellent understanding of wastewater technical issues as well as strong working relationship with key people within Watercare.

**Wastewater Network Planner: North Shore City Council.**
As Wastewater Network Planner I was responsible for the Wastewater Strategy and Policy to meet the long-term objectives of Council, division objectives and legal requirements. Responsibilities included: strategic and catchment management planning, setting annual budgets, development of the 10-year Improvement Work Programme for inclusion in the Long-Term Plan, manage external consultants and internal resources, project management, and technical input to ensure project deliverables/objectives are met.

**Sinclair Knight Merz and Connell Wagner: Project Engineer / Hydraulic Modeller, Hydrogeologist / Water Engineer.**
Prior working experience consists of a variety of consultant roles that have helped me build my experience in project management, engineering, water, wastewater, stormwater, and ground water. I prepared reports, working collaboratively within interdisciplinary teams on a range of projects including landfills, groundwater investigations and modelling, data analysis and manipulation, geotechnical investigations, farmland and drainage improvements, wastewater and stormwater network upgrades and system performance modelling.