Attachment 2:

Further information requested under Section 92 of the Resource Management Act 1991

Contents

#	Category of information	Specific Request	Reasons for request
Healthy Waters			
HW1	Section 3.1 Flood Impact Assessment Revision: C, 16/02/2024	It is understood from Section 3.1 that the Drury South model has been used. The Drury South development used an existing development imperviousness of approximately 3%. The upstream rural catchment can develop to approximately 15% imperviousness as a permitted activity. • Please provide information on what imperviousness has been used in the model for the catchment upstream of Drury South and the reasoning? • Please note we have not reviewed the Drury South Flood Management Assessment (Tonkin & Taylor, June	To better understand the flood assessment approach and methodology

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		2023) for this request. Please provide further information where appropriate.	
HW2	Section 3.2 Flood Impact Assessment Revision: C, 16/02/2024	In section 3.2 it states the Projects will be designed to achieve "*No increase of more than 100mm in flood level on land zoned for urban or future urban development where there is no habitable existing dwelling".* • Why has 100mm been selected? It is understood from the report that flood increases will be contained within existing stream channels, please provide further clarification.	To better understand the flood assessment approach and methodology
HW3	Section 3.2 Flood Impact Assessment Revision: C, 16/02/2024	In section 3.2 it states the Projects will be designed to achieve *"No more than a 10% average increase of flood hazard (defined as flow depth times velocity) for main access to authorised habitable dwellings existing at time the Outline Plan is submitted"*. • Please identify on a plan where flood hazard is proposed to increase. • A 10% increase will have different effects depending on the site and existing flood hazard condition. Please clarify what "No more than a 10% average increase of	To better understand flood effects.

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		flood hazard" means, and whether this would allow for an increase in flood hazard that is unsafe for main access.	
HW4	Table 3-2 Flood Impact Assessment Revision: C, 16/02/2024	Table 3-2 identifies a criterion for flooding effects risk assessment which utilises flood volume displacement. Flood volume displacement is not meaningful unless it can be related to other factors such as increases in flood levels or extents. • Please provide further information on why flood volume displacement was used in the matrix and whether other flood effects assessment that considers changes in water levels, flood extents, flood duration, frequency of flooding, etc was considered and reasons why. • How was the categorisation of Negligible to High determined and what were the reasoning for the categorisation brackets. And why was this cross refence with Land Use? • Are there any factors that could change the categorisation other than Land Use?	To better understand the flood assessment.

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		• How was the Table 3-2 used to inform the design and assessment of the projects?	
HW5	Section 3.2.1 Flood Impact Assessment Revision: C, 16/02/2024	It is understood that the loss of flood storage volume due to the project was estimated using flood plain layers downloaded from AC GeoMaps and the design drawings. It is noted that that flood plain layers shown on AC GeoMaps incorporate 3.8-degree climate change allowance. If climate change is ignored the flood volume (shown on AC GeoMaps) will be less and so the effects (of the proposed works) could be more than currently represented. Climate change can mask the effects of development. If climate change is ignored the actual effects of development can be better understood. • Please clarify if this was assessed and provide reasoning? • Will there be an increase in flood extents, frequency, duration, velocity outside the designation post project for various storm events (ignoring climate change)? Please discuss.	To better understand the flood assessment and flood effects.

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HW6	Tables 6-1, 7-1, 8-1, 9-1 and 10-1 Flood Impact Assessment Revision: C, 16/02/2024	Tables 6-1, 7-1, 8-1, 9-1, and 10-1 mention water quantity treatment for the increase in impervious surfaces. • What water quantity treatment is proposed, please clarify? • Is hydrology mitigation provided?	To better understand the flood management.
HW7	Table 7-2 Flood Impact Assessment Revision: C, 16/02/2024	Table 7-2 indicates a flood displacement volume of 860m^3 and 0.24 ha increase in flood extents upstream of the proposed culvert crossing at CH16000 for the 1% AEP event with climate change. • Please show the flood extents on a plan if it extends outside the proposed designation boundary. • What is the increase in flood extents in a 1% AEP event (without climate change)? • What about other storm events such as the 50% and 10% events, please clarify.	To better understand the flood effects.
HW8	Table 7-2	Table 7-2 indicates a flood displacement volume of 20748m^3 (upstream), 265m^3 (downstream) and 0.45 ha increase in flood extents upstream	To better understand the flood effects.

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	Flood Impact Assessment Revision: C, 16/02/2024	of the proposed culvert crossing at CH18240 for the 1% AEP event with CC. • Please show the flood extents on a plan if it extends outside the proposed designation boundary. • What is the increase in flood extents in a 1% AEP event (without climate change)? • What about other storm events such as the 50% and 10% events, please clarify.	
HW9	Table 7-2 Flood Impact Assessment Revision: C, 16/02/2024	Table 7-2 indicates a flood displacement volume of 4010m^3 and 0.16 ha increase in flood extents upstream of the proposed culvert crossing at CH20820 for the 1% AEP event with CC. • Please show the flood extents on a plan if it extends outside the proposed designation boundary. • What is increase in flood extents in a 1% AEP event (without climate change)? • What about other storm events such as the 50% and 10% events, please clarify.	To better understand the flood effects.
HW10	Table 7-2	Table 7-2 indicates a flood displacement volume of 1242m^3 (upstream), 87m^3 (downstream) and	To better understand the flood effects.

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	Flood Impact Assessment Revision: C, 16/02/2024	0.16 ha increase in flood extents upstream of the proposed culvert crossing at CH22060 for the 1% AEP event with CC. • Please show the increased flood extents on a plan if it extends outside the proposed designation boundary. • What is the flood displacement volume and increase in flood extents in a 1% AEP event (without climate change)? • What about other storm events such as the 50% and 10% events, please clarify.	
HW11	Section 7.5 Flood Impact Assessment Revision: C, 16/02/2024	In section 7.5 it states that “any adverse flooding impacts can be mitigated by upgrading the existing culverts across the motorway”. • Please provide further explanation on why an upgrade is proposed compared to a new culvert. What would be the effects (if any) of proposed new culverts not being considered?	To better understand the flood management.
HW12	Table 8-2 Flood Impact Assessment	Table 8-2 indicates increases of flood extents of 0.02ha and 0.03 ha respectively downstream of culverts CH 23560 and CH 24000.	To better understand the flood effects.

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	Revision: C, 16/02/2024	• Can this increase in extent be shown on a plan if it extends outside the designation?	
HW13	Flood Impact Assessment Revision: C, 16/02/2024	• Ground shaping in the inlet and outlet is proposed to manage flood effects, please clarify which project will have ground shaping	To better understand the flood management.
HW14	Flood Impact Assessment Revision: C, 16/02/2024	Several culverts are identified to be upgraded or new culverts proposed to ensure flooding effects are managed. • It is unclear whether or not these changes will occur, please clarify. • Please list which culverts will be upgrade. • Please indicate which project will have new culverts.	To better understand the flood management.
HW15	Section 11 Flood Impact Assessment	Section 11 of the Flood Impact Assessment indicates "*No more than a 10% reduction in freeboard for existing authorised habitable floors"*.	To better understand the flood effects.

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	Revision: C, 16/02/2024	• Please identify the floors where freeboard may be impacted by the proposed development.	
HW16	Section 11 Flood Impact Assessment Revision: C, 16/02/2024	Section 11 of the Flood Impact Assessment indicates "*No increase of more than 50 mm in flood level on land zoned for urban or future urban development where there is no habitable existing dwelling"*. Section 3 indicates *"No increase of more than 100 mm in flood level on land zoned for urban or future urban development where there is no habitable existing dwelling".* • Please clarify if it is 50mm or 100mm. • Please identify on a plan where these increases will occur. It is understood from Section 10.4 of the Assessment that an increase in flood level of up to 200 mm was identified upstream of culvert CH 16660. • Section 10.5 of the report identified recommended mitigation measures to mitigates increases in flood level. Will these mitigation measures be implemented?	To better understand the flood effects.

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HW17	Specific Outline Plan Requirements Flood Hazard Proposed Draft Conditions, 16/02/2024	There is one condition for Flood Hazard (OPW.1) (and CEMP is used to managed construction effects). • Please define what is flood risk and why this was used, how does flood risk address the flood effects of the projects. What effects might not be captured in flood risk?	To better understand the flood management.
HW18	Drawing RR-0101-A	• Is the flow direction of the swale shown on drawing RR-0101-A correct? If so, where does the swale discharge to? This query is relevant to a number of swales along the designation.	To better understand the flood management.
HW19	AEE Revision: A, 16/02/2024	The NoRs will authorise the construction, operation, and maintenance of various structures. • The Drury South development has a number of stormwater management devices (e.g., flood basins, outfalls, etc). Will the works proposed under the NoRs impact on the functioning of existing or proposed Drury south Stormwater management devices? Please discuss.	To better understand the flood effects.

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		• Mitigation planting has been carried out as part of the Drury South development. Will the works proposed under the NoRs impact on the mitigation planting? Please discuss.	
HW20	Section 8.5 AEE Revision: A, 16/02/2024	SMAF-1 design criteria is proposed within the FUZ/greenfield environments, where discharging to freshwater streams. • The proposed designation will also cover areas that are not within FUZ/greenfield environments and discharge to freshwater streams, will SMAF-1 be used in these areas, please provide reasoning. The Hingaia Stream is actively eroding. • Please discuss if the use of SMAF-1 will be sufficient to mitigate effects on the stream environment caused by the change in land use such as erosion, instream habitat changes, etc. • Please demonstrate whether SMAF-1 is the Best Practicable Option, accounting for the existing state of the stream and its vulnerability to erosion.	To better understand the flood management.

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HW21	Flood Impact Assessment Revision: C, 16/02/2024	A 2.1-degree climate change has been allowed for the Projects. The AC Code of Practice for Land Development and Subdivision is being revised currently to incorporate 3.8-degree climate change allowance for the secondary network. • Please provide information on how a 3.8-degree climate change would affect the Projects.	To better understand the flood effects.
HW22	Flood Impact Assessment Revision: C, 16/02/2024	Appendix A: Flood Modelling Technical Memorandum by Tonkin and Taylor has not been attached to the Flood Impact Assessment. • Please provide the Technical Memorandum. Please note further question may arise following review of the Technical Memorandum.	To better understand the flood assessment.