

16 April 2024

[REDACTED]
City of Gosnells
2120 Albany Highway,
Gosnells WA, 6110

Re: Response to EPA's summary of submissions - Garden St extension proposal

I write concerning the Environmental Protection Authority's Additional Information Document – Summary of Submissions to provide our responses to specific comments in relation to our document; *Garden Street – Hydrology Study & Impact Assessment* (Urbaqua, 2022).

We have reviewed the Summary of Submissions document and the submissions in full for background information and have prepared responses to items relevant to inland waters and the hydrology study and impact assessment in the attached table.

Please do not hesitate to contact me [REDACTED] should you have any questions.

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Attachment 1: Urbaqua responses to submissions relevant to inland waters and the hydrology study and impact assessment.



ATTACHMENT 1: URBAQUA RESPONSES TO SUBMISSIONS RELEVANT TO INLAND WATERS AND THE HYDROLOGY STUDY AND IMPACT ASSESSMENT.

EPA Services comment	Urbaqua response
Inland Waters	
<p><u>Hydrological regime</u></p> <p>Provide further clarification on the hydrological regime of the wetland. There appears to be conflicting information regarding the hydrological regime/functioning of the wetland. For example:</p> <ul style="list-style-type: none"> • 360 Environmental (2022) discussed that “<i>water balance modelling undertaken by Urbaqua (2022) assumes that the wetland is connected to the underlying groundwater aquifer so that groundwater will contribute to the wetland when the groundwater level is above the surface and surface water will be lost to the groundwater system when the groundwater level is low</i>” • 360 Environmental (2023) further notes: <ul style="list-style-type: none"> ○ monitoring results “<i>suggest a very low level of connectivity between the surface water and groundwater at the site</i>” and ○ the wetland is expected to have extensive seasonal waterlogging and inundation from shallow groundwater, surface water runoff or a combination of the two. 	<p>These statements are generally correct, but it is acknowledged that they are somewhat misleading. The text below has been modified to improve clarity:</p> <ul style="list-style-type: none"> • Water balance modelling undertaken by Urbaqua (2022) allows for interaction between the wetland and the underlying groundwater aquifer so that groundwater can contribute to the wetland when the groundwater level is above the surface and surface water will be lost to the groundwater system when the groundwater level is low. • Monitoring results suggest that there is a low level of groundwater inflow to the site because the groundwater level, throughout most of the wetland extent, is always below the surface. • The wetland experiences extensive seasonal waterlogging and inundation. Monitoring and water balance modelling indicates that most of the surface inundation originates as surface water runoff with a small contribution from shallow groundwater.

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<p><u>Pre-development monitoring</u></p> <p>As per the 'Water Monitoring Guidelines for Better Urban Water Management Strategies and Plans (DoW 2012),' pre-development monitoring should capture at least two full years for ecological, surface water, and groundwater monitoring. In addition to data provided in Cardno 2018, the 'Hydrology Study and Impact Assessment' (Urbaqua 2022) provides pre-development groundwater monitoring from November 2020 to May 2021. The Urbaqua monitoring program is unlikely to have captured peak groundwater levels. In total, less than two full years of groundwater levels have been provided, and limited groundwater quality data provided.</p>	<p>Groundwater monitoring was originally undertaken by Cardno from March 2018 to November 2018.</p> <p>Upon revising the water balance modelling for the project to support the EPA referral it was determined that additional data was required, and a second period of monitoring was undertaken by Urbaqua from October 2020 to July 2021 (not May).</p> <p>DWER were consulted prior to initiation of the second monitoring period and did not indicate any information requirements beyond what was proposed.</p> <p>Each of these monitoring periods included capture of a winter peak (October) and therefore two winter peaks have been captured, consistent with usual requirements for predevelopment monitoring programs, and all available data from both programs, and long-term monitoring bores in surrounding areas, was used to inform modelling.</p> <p>Whilst the primary purpose of monitoring undertaken to date has been to provide groundwater level information to support water balance modelling. Some groundwater quality sampling was undertaken concurrently to provide an initial record of background water quality and additional data can be collected prior to construction if required.</p>

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<p>No surface water monitoring data has been provided. Surface water quality sampling should ideally be undertaken quarterly when water is present, and in addition first flush and event based samples should be captured.</p> <p>Insufficient pre development monitoring has been undertaken, and consequently insufficient data has been used to set baseline conditions for trigger values. Further monitoring results or justification for the period of monitoring and the use of results to set baseline conditions is requested (if available).</p>	<p>The primary purpose of monitoring undertaken to date has been to provide groundwater level information to support water balance modelling. Surface water quality sampling has not yet been undertaken but can be carried out prior to construction. Some groundwater quality sampling was undertaken concurrently to provide an initial record of background water quality and additional groundwater quality data can also be collected prior to construction if required.</p> <p>It is noted that the City proposes to complete two baseline surface water sampling events this winter/spring (August and October) when surface water is present. These will be used to inform baseline water quality conditions for comparison during post-development monitoring.</p> <p>Predevelopment baseline water quality information is not required for design purposes, or to assess the hydrological impact of the proposal. Baseline water quality information will be collected prior to construction and used for assessment of post-development water quality.</p>
<p><u>Water balance</u></p> <ul style="list-style-type: none"> • The water balance (Urbaqua, 2022). should be informed by any additional pre development hydrological data as discussed in the above EPAS comment (pre development monitoring). • Clarify the suitability of the 'Open water body water balance model' (Urbaqua 2022) for a wetland with dense vegetation, as this type of 	<p>The water balance was informed by all available pre-development hydrological data, including:</p> <ul style="list-style-type: none"> • Detailed groundwater level monitoring using continuous data loggers and manual measurements from October 2020 to July 2021

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<p>model may not account for the effects of vegetation on water storage, loss, and flow.</p> <ul style="list-style-type: none"> • Explain why only the 'evaporation' component was included in the model, and not the 'evapotranspiration' component, which may affect the accuracy of the water balance calculations for the wetland (Urbaqua 2022, Appendix D & E) • Clarify how in Urbaqua 2022 the evapotranspiration volume from the road batters was estimated, and how it compares to the evapotranspiration volume from the cleared vegetation within the development footprint. The report should also justify the revegetation strategy for the road batters and its impact on the wetland water balance. 	<ul style="list-style-type: none"> • Monthly manual groundwater level measurement undertaken by Cardno from March 2018 to November 2018. <p>The water balance was developed in response to the key risks to the wetland, namely:</p> <ul style="list-style-type: none"> • The potential for increased above ground water levels or inundation extent in the wetland impacting on vegetation health. <p>The open water body water balance model has been used to provide an assessment of the balance between different contributions to surface water inundation within the wetland using recorded groundwater levels to drive groundwater contributions and a surface water model to drive the surface water contributions, including allowance for evaporation from the inundated surface.</p> <p>Changing evapotranspiration due to clearing, as noted in the report section 4.2.4, may result in slightly increasing local groundwater levels. However, as noted in the water balance, surface inundation is predominantly driven by surface water inflows because groundwater is rarely above ground. Therefore, a small amount of groundwater level rise is highly unlikely to substantially change top water levels or the inundation extent in the wetland. It is considered likely that changes to regional groundwater levels due to climate change and other significant</p>

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	<p>regional scale factors (abstraction, increased housing density etc.) will have far greater significance.</p> <p>Evapotranspiration from vegetated road batters have been estimated by applying the same vegetation factors as the existing vegetation, assuming that native species consistent with cleared vegetation will be planted. The total evapotranspiration estimated for road batters is 1,074 kL/yr which is less than 1% of the total post-development evapotranspiration from the wetland. However, despite this very small contribution to the water balance, the revegetation of road batters is important to provide stabilization of the bank batters to prevent erosion, and to assist with management of stormwater overflows in larger flood events.</p>
<p><u>Stormwater drainage and water quality</u> A pit and pipe drainage system, including pipe discharge into the wetland, has been proposed (Urbaqua 2022). Runoff from the high-traffic road can mobilise pollutants such as metals and hydrocarbons. Although Urbaqua 2022 discusses retaining/infiltrating runoff by installing soakage devices, the devices may not be capable of treating polluted runoff before retention/infiltration on-site or allowing it to flow into the wetland. Further information on how the proposed treatment approaches for stormwater runoff are sufficient for the site conditions (i.e. conservation category wetland) is requested. This may include evidence of previous success in the application of the treatment approach (including the GPTs proposed) in meeting environmental outcomes.</p>	<p>As noted, the primary pollutants of concern from road runoff are hydrocarbons and metals.</p> <p>The Department of Water and Environmental Regulation's Decision Process for stormwater management in WA specifies onsite management of the runoff generated by the first 15mm of rainfall in acknowledgement that most of these pollutants are mobilized by these 'first flush' events.</p> <p>At the proposed gross pollutant trap (GPT) locations, a Spel Ecosepter or similar will be installed and the Ecosepter is designed to intercept 93% of hydrocarbons and 95% of Gross pollutants from first flush events.</p> <p>As a secondary measure, each drainage pit within the proposed drainage network will also include a 300 mm sediment trap which</p>

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	will trap sediment and sediment-bound nutrients and other contaminants. These sediment trapping drainage pits are a standard specification used successfully throughout the City's drainage system. The Spel Ecosepter and drainage pits will be maintained by the City's Operation team to ensure operational longevity and effectiveness at treating the runoff.
<p><u>Post development monitoring</u></p> <p>The Urbaqua (2022) and RPDMMMP (360 Environmental 2023b) report indicates that annual water quality monitoring of runoff from the road will be undertaken for 2 years post construction. This timeframe may not be adequate to identify water quality impacts resulting from the operation of the road. In the absence of significant (i.e. 10+ years) water quality monitoring, water quality impacts both within and adjacent to the development envelope and the effectiveness of proposed hydrological mitigation measures may not be able to be assessed.</p> <p>The post development monitoring program is also of insufficient frequency to allow required contingencies and adaptive management measures to be applied. Consideration of more frequent monitoring is required, including monthly groundwater levels, quarterly groundwater quality and surface water quality, and first flush and event based surface water samples. The sample suite should be expanded to include hydrocarbons and metals.</p>	<p>The City has indicated a commitment to additional monitoring beyond the proposed 2 year program, as follows:</p> <ul style="list-style-type: none"> • Two years of groundwater monitoring with loggers supported by quarterly manual groundwater level readings and quarterly groundwater and surface water quality sampling, including hydrocarbons and metals for assessment against predevelopment baseline data. • After 2 years, if groundwater levels are consistent with surrounding regional groundwater levels and water quality results are consistently below trigger values, the groundwater loggers will be removed, and the program will continue with quarterly groundwater levels and groundwater and surface water quality for a further 3 years (5 years total groundwater and surface water monitoring to match the monitoring period for vegetation health). • If threshold criteria for groundwater levels are exceeded, then logger monitoring will continue for 3 more years. • Extension of the monitoring program beyond 5 years will be

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	considered if threshold criteria are exceeded and contingency actions are needed.
<p><u>Construction impacts</u></p> <p>Section 6.5.6 of the RSD (360 Environmental 2023) states that “<i>The construction of the road extension will include compaction of the soil layers beneath the road. This has the potential to make a barrier to the groundwater flow and impact the groundwater flows and levels. The compaction is overall not expected to significantly influence groundwater levels and/or flow</i>”. Further information is requested to justify the determination that compaction will not significantly impact groundwater levels and flow.</p>	<p>As described in section 4.2.3 of the Hydrology study: Although the likelihood of any influence on groundwater flows is low, due to the flat groundwater gradient, an assessment of the proposed construction/compaction method was undertaken.</p> <p>The assessment found:</p> <ul style="list-style-type: none"> • The proposed road design will be constructed with a minimum of 600mm clearance from maximum groundwater level. • Compaction for the road construction will not penetrate any deeper than 550mm. • Therefore, the proposed design will not involve compaction of soils below the maximum groundwater level and will not impede groundwater levels or flows.

References:

360 Environmental (2022) Section 38 Environmental Protection Act Referral Supporting Document: Garden Street Extension, Southern River. Prepared for the City of Gosnells.

360 Environmental (2023) Section 38 Environmental Protection Act Referral Supporting Document: Garden Street Extension, Southern River. Prepared for the City of Gosnells.

360 Environmental (2023b) Garden Street Extension, Southern River Revegetation and Post Development Management and Monitoring Plan. Prepared for City of Gosnells.

Cardno (2018) Garden Street Extension Groundwater Monitoring.

Urbaqua (2022). Garden Street Extension, Gosnells Hydrology Study & Impact Assessment. Prepared for the City of Gosnells.

The proposal – General comments

INLAND WATERS

No.	Submitter	Submission and/or issue	Response to comment
14	ANON-QTYN-1C8B-T ANON-QTYN-1C8D-V	The modelled average and maximum post-development water levels for the wetland (Hydrology Study and Impact Assessment p23) show significant reductions in the water levels of the wetland area, demonstrating that there will be impacts to the hydrology in and outside the development area.	The maximum predicted change in modelled average and maximum water levels is a small <u>increase</u> of 0.02m in Section 1 of the wetland only, as shown in the Hydrology Study and Impact Assessment.
15	ANON-QTYN-1C8N-6 ANON-QTYN-1C8Q-9	The wetland within the development envelope area has a management objective of “Conservation”. The development envelope falls within the Southern River vegetation complex, only 1.5% of which is secured in conservation areas in the Perth-Peel region and includes the area within Bush Forever Site 125. Given the Bush Forever objective of retaining 10% of each vegetation complex in conservation areas, any further loss of this complex is unacceptable.	This comment does not relate to hydrology.
16	ANON-QTYN-1C8B-T ANON-QTYN-1C8N-6	The proposal will also compromise any buffers that protect the existing wetland from pollution runoff. The proposal does not appear to address the Department of Water (DoW) guidance of “vegetated buffers are key strategic elements among a series of protection barrier options that reduce the risk of contaminant impact on water quality” (DoW, 2006) and strategies to protect wetlands and waterways from contamination, DoW identifies “land use activity constraints”.	Stormwater from the surrounding urban area is currently piped directly into the wetland and does not pass via any established buffer. Stormwater from the proposed road will be treated by two gross pollutant traps prior to discharge which will remove 95% of hydrocarbons, which are the main pollutants from roads.
17	ANON-QTYN-1C8B-T	The groundwater monitoring results in the vicinity of the Proposal are concerning and are suggestive of industrial contamination. They show exceedances of a range of water quality criteria including total nitrogen, total phosphorus, aluminium, chromium and dissolved chromium, lead nickel and zinc and petroleum hydrocarbons. The WA Contaminated Sites Database is suggestive of the area being used as an uncontrolled dump site. Asbestos contamination in the area is also common.	Predevelopment water quality at the site is generally consistent with other similar sites on the Swan Coastal Plain where historic rural (eg: agriculture, horticulture or agistment) and urban (eg: light industry or petrol stations) land uses and management practices

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			<p>have resulted in accumulated nutrients and other contaminants. The proposal includes water sensitive urban design approaches to prevent deterioration of water quality but cannot remove legacy contaminants.</p>
18	ANON-QTYN-1C8B-T ANON-QTYN-1C8N-6 ANON-QTYN-1C8Q-9 ANON-QTYN-1C8J-2	<p>The proposal will fragment an urban wetland system and will likely interrupt the natural hydrology of the area and will be a pollution source to the wetland.</p>	<p>The proposal has been designed to minimize the impacts to the environment and hydrology as much as possible.</p> <p>The hydrological assessment demonstrates that the proposal will have very little impact on the hydrology of the wetlands due to installation of two balancing culverts through the wetland.</p> <p>Stormwater from the proposed road will be treated prior to discharge into the wetlands.</p>