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EPA Victoria
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RE: FEEDBACK ON PUBLICATION 1739: DRAFT URBAN STORMWATER MANAGEMENT GUIDANCE

Thank you for the opportunity to provide feedback to Victoria EPA's consultation publication *Draft urban stormwater management guidance* (Draft publication, October 2020, available at https://www.epa.vic.gov.au/about-epa/publications/1739). This correspondence outlines our comments and associated recommendations to this document. We would, however, welcome the opportunity meet with relevant personnel from Victoria EPA (and other stakeholders, if appropriate) to provide clarification or discuss anything further.

- **Application/ development thresholds:** Page 4 states that "This guide is provided for developers who create new impervious surfaces, such as roads, subdivisions and other developments". However, it is unclear what are the development thresholds (e.g. area, number of dwellings) that would 'trigger' application/ compliance with the guideline. As an example, Queensland's *State Planning Policy*[1] (specifically page 46) clearly defines the development thresholds where the policy (and associated stormwater management targets) apply.
    - ***Recommendation*:** Define the development thresholds that would trigger application/ compliance with the guideline recommendations.
- **Human health risks:** The report makes several references to urban stormwater being a risk to human health. For example, Appendix 1 states that "Uncontrolled stormwater runoff can also harm downstream bays, lakes and coastal waters, and pose a risk of harm to **human health**".
    - ***Recommendation*:** The risk to human health (which we agree with) should be suitably referenced and/ or further detail described, including an identification/ description of the actual risks to human health.
- **Pollutants of concern:** Relative to the above point, the report provides no information on what the pollutants of concern are (including to human health) – referring only to targets for suspended solids, total phosphorus and total nitrogen, without any information about whether these are key pollutant of concern (particularly for waterway and human health). This is particularly relevant given section 2.1 recommends that the developer assess the risks – but without an appropriate understanding of

[1] Queensland Government (2017), *State Planning Policy*, https://dsdmipprd.blob.core.windows.net/general/spp-july-2017.pdf

potential hazards (including their identification and relevance), this is unlikely to be appropriately undertaken.

  - ***Recommendation*:** Identify pollutants of concern (or provide suitable references to supporting documents, identifying potential pollutants of concern associated with various land use types and/ or downstream waterways).

- **Table 1 – Suspended solids removal target:** It is not clear why EPA Victoria continues to apply an 80% mean annual load removal target for suspended solids, given an 85% target is commonly applied in NSW (e.g. Sydney Water, NSW Roads and Maritime Services, Blacktown City Council, City of Sydney, Parramatta City Council) and is recognised as being a reasonable and practical target for new development. Queensland's *State Planning Policy* applies an 80% target, but this state is characterised by relatively high intensity rainfalls (and subsequently relatively high flow rates), making it more difficult to remove pollutant loads relative to Victorian climate conditions.
  - ***Recommendation*:** Revise the suspended solids removal target to 85%.
- **Table 1 – Phosphorus removal target:** It is not clear why EPA Victoria continues to apply a 45% mean annual load removal target for total phosphorus, given a 60% or 65% target is commonly applied in other parts of Australia (e.g. Sydney Water, NSW Roads and Maritime Services, Blacktown City Council, City of Sydney, Parramatta City Council, Queensland's *State Planning Policy*) and is recognised as being a reasonable and practical target for new development.
  - ***Recommendation*:** Revise the total phosphorus removal target to 60%.
- **Table 1 – Litter removal target:** It is not clear why EPA Victoria continues to apply a 70% mean annual load removal target for litter, given a 90% target is commonly applied in other parts of Australia (e.g. Sydney Water, NSW Roads and Maritime Services, Blacktown City Council, SOPA, City of Sydney, Parramatta City Council, Queensland's *State Planning Policy*) and is recognised as being a reasonable and practical target for new development.
  - ***Recommendation*:** Revise the litter removal target to 90%.
- **Table 1 – Reduction targets relative to developed site without 'treatment':** Load and volume reduction targets based on the developed site without 'treatment' provide zero incentive to integrate design elements into a development (e.g. reduced imperviousness) that will otherwise reduce the need for treatment. We recognise that mean annual load reduction targets have been in place for several years, and likely should not be reduced. However, we would sincerely question the appropriateness of flow reduction targets based on the developed site without treatment.
  - ***Recommendation*:** We recommend that flow reduction targets be based on the pre-development land use (e.g. 'no worsening' or maximum mean annual runoff volume), already applied for stormwater quantity and flooding standards.
- **Table 1 – Flow reduction targets:** It is anticipated that the flow reduction targets are excessive, will cause significant confusion for developers (and regulators), require significant initial and ongoing resources for asset managers (e.g. managing harvesting, treatment and reuse infrastructure), have limited scientific justification, and will highly unlikely to be practical for the majority of new development. It is also unclear what flow reduction targets would actually be applied, given that a target range (50-90%) is given for priority areas, and that Note 2 states "these are general objectives and, in some cases, a higher or lower percentage of flow reduction objective may be justified based on scientific evidence".

As described further below, three of the given scenarios include a 'low lying sponge in the floodplain', which we do not believe will function as intended – and no guidance is provided or available in relation to their application.

Whilst we recognised the hydrologic impacts of urbanisation should be appropriately mitigated, it is likely that flow reductions may be best achieved (at least in part) external/ downstream of individual development sites (particularly for industrial/ commercial sites whether opportunities for reuse and infiltration will likely be limited).

- ***Recommendation 1*:** As per above, targets should be based on pre-development conditions (instead of annual reductions when compared to the development site without 'treatment'). If not, target annual flow reductions should be reduced and clearly defined (e.g. minimum of 20%)
- ***Recommendation 2*:** Provide appropriate guidance in relation to the design, implementation and management of the example 'sponges'.
- ***Recommendation 3*:** and/ or developers' provided the option of contributing to a voluntary stormwater quantity offset to appropriately fund stormwater harvesting infrastructure (or similar flow reduction strategies) external to the site.

- **Table 1 – Flow and pollutant load reduction targets:** It is unclear if given targets include any water (and associated pollutant loads) "lost" due to harvesting and/ or exfiltration from WSUD assets.
  - ***Recommendation*:** Clarify if given targets includes any water "lost" due to harvesting and/ or exfiltration from WSUD assets.
- **Table 1 – Evaluation, monitoring and management:** The cited targets appear to be design targets, with compliance anticipated to be 'demonstrated' via conceptual predictive modelling software, with requirements regarding how objectives will actually be achieved. As widely recognised, the ability of any stormwater treatment strategy (and associated assets) to function as intended and achieve given targets is highly dependent on the appropriate management/ maintenance of the asset.
  - ***Recommendation*:** Include the following note to Table 1 "*Appropriate evaluation, monitoring and maintenance of stormwater control measures (and associated reporting of their condition) must be undertaken to augment their design stormwater treatment function*". Clear guidance should also be provided in relation to how evaluation and monitoring should be undertaken.
- **Section 2.2:** A range of potential controls are included, but proprietary stormwater cartridge systems and/ or membrane filtration systems are not listed. These WSUD asset types are commonly applied as secondary and tertiary treatment systems, and Ocean Protect alone have installed over 28,000 StormFilter cartridge systems and over 1200 Jellyfish membrane filtration systems within Australia.
  - ***Recommendation*:** "Cartridge systems" and "membrane filtration systems" be added to the list of tertiary and secondary controls.
- **Section 2, first paragraph:** Missing link.
  - ***Recommendation*:** Add link.
- **Section 3:** None of the development scenarios have any of the following characteristics:
  - Any design elements aimed to minimise the generation of flow and/ or pollutant loads – and instead rely on 'treatment' alone
  - Achieve flow reduction targets above 60% (noting that Table 1 refers to potential flow reduction targets of 90% or more). Almost all development scenarios only have a predicted target of 25% flow

mean annual flow reduction (which would likely assume fully function stormwater treatment measures, which would be highly ambitious)

- Commercial, industrial and/ or high density residential development on a constrained site (with minimal opportunities for reuse and/ or infiltration).

The majority of the given scenarios include biofiltration systems or wetlands. As outlined above (and described by the Victoria Environment Protection Agency (2020)[2], the ability of conventional bioretention systems and wetlands to remove stormwater pollutant concentrations (particularly nutrients) is variable. Furthermore, various studies published papers (e.g. Dalrymple et al (2018)[3] demonstrate that high rates of bioretention systems and wetlands in the 'real world' in Australia are in a 'poor' or 'very poor' condition, requiring significant rectification works. We would subsequently question the appropriateness of heavily relying on these assets to ensure the protection of waterways.

Furthermore, three of the given scenarios include a 'low lying sponge in the floodplain'. There is no information available about what the potential configuration/ application of such a 'sponge', nor is there any guidance information provided or available (e.g. how should they be sized, what is the maximum hydraulic, sediment and/ or pollutant loading rate, what is the minimum in situ soil permeability). It is anticipated that, for the vast majority of sites, a 'sponge' is highly unlikely to function as intended (particularly due to a high likelihood of sediment-laden runoff blocking the surface and reducing its ability to drain), and would likely have a high likelihood of being akin to a 'boggy swamp' or 'snake pit', akin to the many poorly functioning conventional bioretention systems across Australia.

- ***Recommendation 1***: Require any proposed stormwater treatment asset to have demonstrated 'real world' performance testing undertaken to demonstrate that pollutant concentration (and load) reduction rates will be achieved, and not solely rely on algorithms within modelling software (e.g. MUSIC).
- ***Recommendation 2***: Provide appropriate information and guidance in relation to the design, implementation and management of the example 'sponges'.
- ***Recommendation 3***: Provide appropriate case studies/ scenarios to demonstrate how given targets will actually achieved in the 'real world'. Ideally, these should be 'real world' case studies and not hypothetical conceptual designs with compliance <u>demonstrated</u> by performance monitoring and not <u>predicted</u> by modelling.

Please contact me if you have any questions or would like to discuss anything further.

Yours faithfully,

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Principal Environmental Engineer

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[2] Victoria Environment Protection Agency, 2020. Publication 1829: Background information: Draft urban stormwater management guidance consultation guide, https://www.epa.vic.gov.au/about-epa/publications/1739

[3] Dalrymple, B, Coathup C, Coathup J, Penhallurick B, 2018, Point break for the WSUD Asset Wave, Ozwater, Melbourne, Victoria, Australia.