Urban stormwater guidance

Response to public comments

Publication 1972 | June 2021

Authorised and published by the Victorian Government, 1 Treasury Place, Melbourne

Publication 1972 June 2021
Authorised and published by EPA Victoria
Level 3, 200 Victoria Street, Carlton VIC 3053
1300 372 842 (1300 EPA VIC) **epa.vic.gov.au**

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Introduction

From 21 October to 16 December 2020, EPA Victoria sought public feedback on the draft *Urban stormwater management guidance* (the draft guidance).

As Victoria grows, the number of urban sealed surfaces also grows, increasing the volume of stormwater generated. EPA has received consistent feedback from stakeholders that it is important to reduce stormwater flows and more needs to be done to protect the environment from the risks associated with stormwater generation. Risks associated with urban stormwater include:

- erosion
- pollution of waterways
- human health risks
- harm to aquatic ecosystems.

Providing updated, science-based guidance relating to urban stormwater management is an important step towards achieving a reduction in risks from stormwater. The draft guidance built on the updated scientific research presented in: *Review of stormwater science* (publication 1919) published in October 2020. The review was commissioned by EPA and conducted by the Cooperative Research Centre for Water Sensitive Cities Ltd to provide an understanding of recent stormwater science. The report aimed to review science undertaken since 2013 when the last review took place.

The Urban stormwater management guidance is intended to help improve urban stormwater management in Victoria. It supports minimising the risk of harm to human health and the environment through good environmental practice, and it provides information that will support the planning and design of new urban stormwater management systems. The guidance:

- highlights the risk to waterways and bays the creation of sealed (impervious) surfaces causes
- provides general objectives and information to support risk assessment and minimisation
- explains stormwater management for communities in Victoria.

The Urban stormwater management guidance (EPA publication) was developed through:

- review of stormwater science, including scientific research on waterway values and place-based objectives, flows, water quality, stormwater management objectives and the performance of urban stormwater management measures
- analysis of different stormwater control measures that reduced flow volumes for typical development scenarios
- alignment with government policy and strategies such as Water for Victoria 2016 and the Port Phillip Bay Environmental Management Plan 2017–2027 (EMP) and Healthy Waterways Strategy
- consultation across other government agencies such as Department of Environment, Land, Water and Planning (DELWP), Victorian Planning Authority (VPA), Municipal Association of Victoria (MAV), and Department of Health (DH) (formerly Department of Health and Human Services), water authorities, Melbourne Water, practitioners and leading developers and local councils.
- consultation with the public.

Our engagement objectives

EPA aimed to:

- understand the level of support for the draft guidance among stakeholders and the public
- seek stakeholder input to improve usability of the guidance
- gather suggestions for changes to stormwater performance objectives, when supported by robust data and science
- support stakeholders and the public to participate meaningfully in the engagement process.

How we engaged with stakeholders and the community

As part of this consultation process EPA engaged through a number of different forums to gain an understanding of the views of a broad section of relevant stakeholders and the public. We spoke with other government agencies including DELWP, VPA, MAV, and DoH (formerly DHHS), water authorities, Melbourne Water, practitioners and leading developers, local councils and the general public. We encouraged feedback through a range of engagement strategies.

Engagement activities included:

- presenting at nine reference group (https://www.epa.vic.gov.au/about-epa/who-epa-works-with/reference-groups) meetings targeting the construction and infrastructure industry, water industry and the community
- publishing two EPA bulletins to update the public on progress
- providing regular updates on the guidance development through a dedicated EPA webpage
- holding four external forums with MAV (two), Urban Development Institute of Australia (UDIA) and Stormwater Australia/Victoria
- holding four workshops (two with Council Alliance for a Sustainable Built Environment (CASBE) and two with the Resilient Cities and Towns Reference Group
- one on one conversations with highly involved stakeholders
- invitation to the general public to provide comments on the draft guidance through EPA's website and email to the review's subscribers list
- many industry associations, who circulated the draft guidance through their channels.

Public consultation on the draft Urban stormwater management guidance

The draft guidance was published to EPA's website in October 2020 and the public were invited to provide comment by 16 December 2020. EPA also published an accompanying support document: Background information consultation guide (publication 1829) to support and guide the public in providing feedback.

Submitters were invited to provide feedback on the draft regarding issues such as:

- how the guidance helps manage risk
- whether the guidance includes all the information needed
- potential barriers to implementation, including barriers to considering risk factors
- percentage flow reductions achieved currently
- metrics currently being used to model flows
- methods currently used to minimise risk of harm from activities that may contribute to urban stormwater runoff

- stakeholders' level of understanding of a risk-based approach
- other factors involved in assessing risk of harm from creation of impervious surfaces.

EPA received a total of 42 submissions during public comment period. These submissions were analyzed to identify individual issues and common themes for response.

Summary of issues raised in submissions

A diverse range of stakeholders provided submissions (Figure 1: Submissions breakdown by stakeholder group). The issues raised are summarized below:

- request for specific objectives that show rainfall influence
- different or increased objectives
- request for numeric minimum standards/compliance requirements and offsets
- uncertainty about what is reasonably practicable
- achieving the objectives
- appropriateness of existing software tools
- implementation and ongoing maintenance of controls, roles and responsibilities
- developing state of knowledge and additional risk factors to consider
- construction and sediment control
- identifying priority urban stormwater management areas outside greater Melbourne
- managing human health risks and waterway values
- importance of integrated water management
- request for additional indicative management scenarios and infographics
- minor edits and amendments to provide clarity.

Of the issues raised by submissions, most were out of scope for making changes to the guidance.

The most frequently raised issue that was in scope was the request for specific objectives showing how the objective changes based on rainfall, and more clarity on the alignment with the Healthy Waterways Strategy.

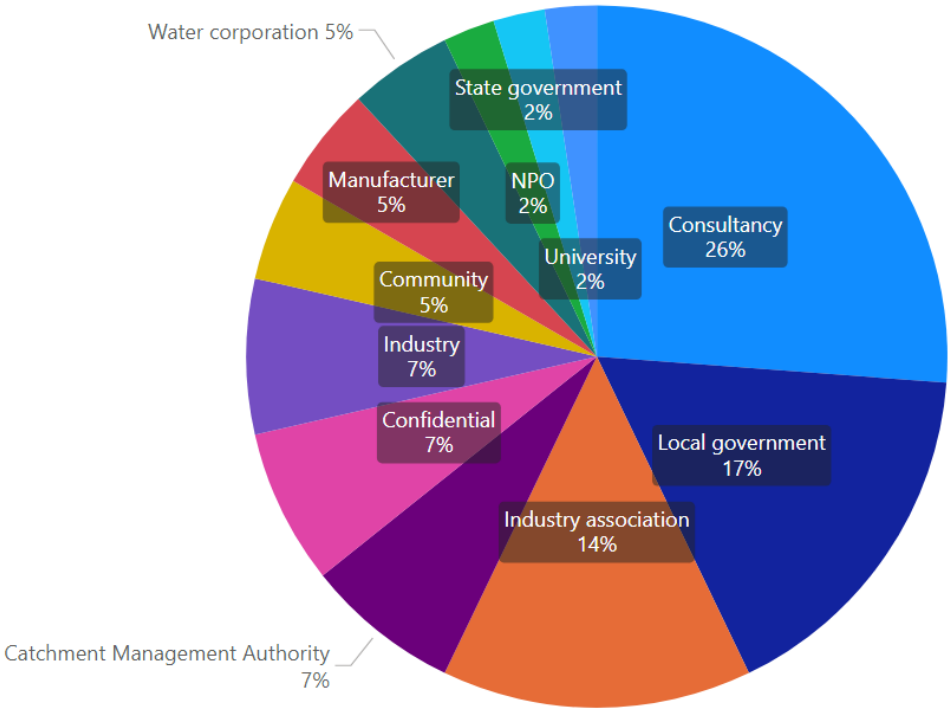


Figure 1. Submissions breakdown by stakeholder group

Summary of response to issues raised

EPA analysed each of the issues against clear criteria to help determine whether changes should be made to the draft guidance. The criteria enabled an assessment of whether the issue:

- raised significant new information that prompted reviewing the proposed approach
- identified significant unintended consequences, such as misalignment with government policy
- proposed an alternative approach that offered a better opportunity to achieve the purpose of the guidance – improve the management of urban stormwater flows and minimising the risk of harm to human health and the environment
- proposed an approach that could be readily understood and used generally by industry now.

Where issues were outside the scope of the guidance, were not supported by robust data or were not in line with government policy, they did not lead to changes to the guidance. Some issues suggested improvements that may be considered in future publications but were not considered necessary or practicable for implementation prior to publication of the guidance.

Table 1 summarises the key issues that resulted in changes to the draft guidance in response to public comments and further consultation.

Table 1: Summary of key issues raised resulting in changes to the draft guidance

Key issue	Change made
Request for specific objectives	
A revision was requested to the objectives to show the specific stormwater performance management objective for flows are based on rainfall and focussed on the impervious fraction of the site.	The objectives have been updated to be specific and based on rainfall, and the impervious fraction. This reduces confusion, and there is more consistency in the level of protection aimed for.
Uncertainty about what is reasonably practicable	
There was uncertainty about how to assess what is reasonably practicable.	A list of the key questions to help understand what is reasonably practicable has been included in the guidance. There are also links to further guidance on assessing reasonably practicable.
Appropriateness of existing software tools	
There was concern that EPA was seen to be 'endorsing' certain software tools. Shortcomings of some existing tools were also raised.	It is not the intent of the guidance to endorse a particular software tool. The final guidance has been changed to make it clear that the focus is on relevant modelling, which is appropriate and acceptable to Council. What level of modelling will depend on the scale and risk from the development. It is expected that software tools and knowledge will improve over time, meaning that what is appropriate and acceptable may change. DELWP will progress the issue of the Stormwater Treatment Objective (STORM) calculator functionality, updates and hosting arrangements.
Minor edits	
There were suggestions for various minor edits and requests for further detail and clarifications.	Changes were made including: • specific examples of human health risks • links to clear map of priority areas • further detail to some of the factors that may influence risk in section 2: including reference to climate change and soil conditions • "artificial" descriptor added to "wetlands" to distinguish between natural wetlands and specifically designed artificial wetlands • practitioners, small and large-scale developers added to relevant parties list

Draft Guidance: key issues and responses

This chapter summarises the response to concerns raised in submissions on the draft guidance, including general comments on the new environment protection framework.

New environment protection framework

The amended *Environment Protection Act 2017* will come into effect on 1 July 2021. The general environmental duty (GED) is a centrepiece of the new laws. It applies to all Victorians. Under the GED a person must minimise risk of harm to the environment and human health from their activities. Minimise means (a) to first eliminate risks of harm to human health and the environment so far as reasonably practicable; and (b) if it is not reasonably practicable to eliminate risks of harm to human health and the environment, to reduce those risks so far as reasonably practicable.

Request for more specific objectives

Issue

Many submissions across industry and government, including practitioners and consultants, requested that specific stormwater performance management objective for flows be provided based on rainfall and clearly focussed on the impervious area.

The general objectives expressed in the draft as a reduction in total mean annual runoff supported a simple risk assessment, alongside a list of key factors that influence risk such as rainfall and impervious surface. However, a wide range of stakeholders, across government, industry and community, called for more specificity in the objectives to better characterise the risk of harm and improve usability. Clearer articulation of alignment with the Healthy Waterways Strategy objectives was also requested.

Response

In response to this issue, the flow management objectives have been updated to be based on specific rainfall bands and the impervious proportion of the land included in the development. Falling below the objectives continues to be a clear indicator of risk of loss of waterway values.

This change in measurement method for the objectives reduces confusion and increases consistency across all of the flow management objectives, representing more place-based objectives. By limiting the objectives to apply only to the impervious surfaces created by a development, this reduces the risk of duty holders 'over applying' the objectives and harvesting or infiltrating more water than necessary.

The new specific flow objectives also provide a clearer articulation of the alignment with the Healthy Waterways Strategy. The specific flow objectives for priority stormwater management areas have been approved by government as part of the Healthy Waterways Strategy.

Compared to the draft, the total percentage volumes of stormwater to be managed on average are the same or similar. The draft guidance set flow management objectives for priority areas in a range between 60-100 per cent (combining baseflow contribution and harvesting) for all rainfall bands and surfaces for total annual runoff. Flow objectives in the final guidance remain in this range but provide greater clarity for different contexts.

The new specific flow objectives for all other areas recognise that infill and redevelopment activities of already highly modified areas still need to reduce risk of harm to the environment and human health from urban stormwater runoff through consideration of the design of stormwater management systems. However, the objectives for these areas are lower than those associated to priority areas because the areas are generally already highly modified, so the objectives reflect the generally different circumstances and high levels of existing imperviousness.

The draft guidance set flow objectives for these areas at 35 per cent (combining baseflow contribution and harvesting) of total annual runoff for all rainfall bands and surfaces. Flow objectives for

harvesting/evapotranspiration or infiltration/filter in the final guidance for these other areas (not identified as priority) are set at lower or higher levels at times, and this reflects the shift to incorporating the influence of rainfall, based on the strong feedback in submissions. The objectives for these areas are lower though (easier to meet) for harvesting in high rainfall areas, and infiltration is easier to meet for average and low rainfall bands for all types of development.

To restore a waterway in a degraded environment, it is likely that the priority objectives or better would need to be applied.

EPA has further addressed this issue by working with Melbourne Water to develop an additional practitioner's note to show how this modelling can be done and provide additional support for industry and assessors.

Different or increased objectives

Issue

Some submissions from industry and community highlighted that the 25 per cent reduction in total annual runoff was already being achieved and the objective for areas not in priority areas should potentially be higher. Also, some submissions raised that the objectives for total nitrogen, total phosphorous and suspended solids may also need to be higher. One university submission proposed using an alternative approach and index which combined multiple components to produce a score.

Response

No changes were made to apply a blanket increase to the objectives or introduce the index in the guidance. The objectives are to help support, rather than replace, a risk assessment. Such an assessment may show that, for example, higher water quality objectives are needed in a specific situation to protect waterway values. Our understanding of risks to human health and the environment changes over time. New technology and techniques allow better risk management. Regularly checking risks and controls can be done by reviewing:

- understanding of the consequences of activities and whether they are likely to cause risks
- the effectiveness of the approach to managing risks
- controls in place to reduce the risk of harm to human health and the environment. This is important to do when new options to control risks become available.

By doing this, you can make sure they continue to minimise risk and meet the current understanding of what is reasonably practicable.

The university submission proposed a new index that has been used in the Little Stringy Bark Creek catchment to protect streams from new developments via an environmental significance overlay (ESO) mechanism, which places a minimum requirement on certain developments. The approach presented provides indicators but not targets, and further work would be required to develop them for other areas.

However, the harvesting and infiltration/filtration objectives in the guidance are based on the same science and are aligned with two of the flow metrics in the university submission's proposed index. By keeping the metrics separate we are providing simpler and a more transparent standard that can be readily modelled with existing tools. The indicators provide a good surrogate for the flow frequency and water quality components of the submission's index and the use of loads-based indicators is well-established in industry as a metric. The above takes into consideration the audience of the guidance, and alignment with government strategies such as the HWS, which the submission also recognises as being a valuable approach. However, this does not preclude use of the index.

Request for numeric minimum standards / compliance requirements and offsets

Issue

The most common theme across issues raised in the submissions was a request for the introduction of numeric compliance requirements that would be minimum standards and complement the guidance. In the submissions that discussed appropriate compliance instruments, the Victoria Planning Provisions was raised as the most appropriate tool to enforce and prevent harm at an early stage. Alongside the discussion of developing flow compliance requirements, submissions highlighted the role that offsets could play as an economic tool and efficient means to meet strategic objectives and regulatory requirements.

Response

No changes to the draft guidance were made in response to this issue. Numerical targets to reduce levels for solids, phosphorous and nitrogen are longstanding and requirements to achieve them (https://www.water.vic.gov.au/liveable/stormwater/Stormwater-management-for-urban-development) continue.

The objectives for urban stormwater flow reduction housed in this guidance are not compliance requirements, and the level of stormwater flow reduction achieved will depend on what is reasonably practicable, as set out under the GED.

Although developing compliance requirements is out of scope of this guidance project, it does not preclude EPA or other parts of the Victorian government from developing regulatory tools with numeric compliance requirements in the future. For example, there are currently compliance requirements in place under the VPPs for total nitrogen, total phosphorous and suspended solids.

The Improving Urban Stormwater Ministerial Advisory Committee (MAC) recognised that a broader package of reforms was needed to improve stormwater management, and the committees' longer-term recommendations are under consideration. For example, the MAC recommended establishing effective offsetting arrangements to increase flexibility and cost effectiveness and to help make stormwater a valued resource. DELWP is currently developing a Stormwater Offsets guidance framework for Victoria.

Uncertainty about what is reasonably practicable

Issue

There was a mix of stakeholder views on the new **GED** (https://www.epa.vic.gov.au/for-business/new-laws-and-your-business/general-environmental-duty)under the *Environment Protection Act 2017*, and understanding what is reasonably practicable. Some local councils and developers were comfortable with 'reasonably practicable' as a concept as they already applied risk assessments that led to proportionate risk-based controls, while some were concerned that differing views or weightings of the criteria that 'reasonably practicable' is based on under s 6 of the EP Act could lead to VCAT cases.

Response

EPA is aware that there is some uncertainty across duty holders in Victoria on how the GED will be interpreted and enforced by EPA and courts. To address this, EPA has provided other guidance to assist in that interpretation. See *Industry guidance: Supporting you to comply with the general environmental duty* (publication 1741.1) (www.epa.vic.gov.au/about-epa/publications/1741-1). For that reason, no significant changes have been made to the urban stormwater guidance to address this issue. However, a list of key assessment questions has been included in the guidance.

Some submissions showed a misunderstanding of the relationship between enforcement and guidance. EPA will not 'enforce' guidance but will use guidance to inform its expectations of duty holders' awareness of 'state of knowledge'. The state of knowledge is one out of the five factors that defines what is reasonably

practicable. It is the body of accepted knowledge known or ought to be known about risks and how to control them. Industry may draw on a number of sources to access this knowledge, whether that be through EPA, industry associations, research centres or other independent organisations. EPA guidance contributes to industry state of knowledge and is not a compliance document. The content of the urban stormwater management guidance complements and adds to the knowledge established through previous guidance and planning requirements.

EPA recognises that transition to the new framework will take time for duty holders. As outlined in the draft Regulatory Strategy 2020–2025, across the transition to the new framework, EPA will be focused on support and education, while continuing to address the biggest risks of harm.

Some submissions noted that there are varying understandings of what is meant by 'best practice', noting that it is often used to mean 'what is reasonably practicable' in planning assessments, rather than the best available techniques and technologies. To avoid this misunderstanding, the guidance uses the terminology 'reasonably practicable' which is in keeping with the *Environment Protection Act 2017*. However, in other frameworks, including local laws such as Environmentally Sustainable Development policies, best practice may be defined similarly: risk-based, proportionate, appropriate to the scale of development and taking into account site-specific opportunities and constraints.

Achieving the objectives

Issue

Submissions raised concerns that though the objectives could be achieved, they may not be able to be achieved in all settings. For example, it was raised that there are:

- legacy situations where land use and servicing decisions have previously been made and pose obstacles
- complexities in gaining the support and co-operation of public land managers and water authorities to implement solutions away from private land
- considerations that require managing competing objectives for lot yield, private and public open space, service authority assets and meeting geotechnical objectives
- competing functional objectives of surrounding infrastructure and their perceived impacts on operational effectiveness, for instance incorporating permeability in the road pavement.

Response

No changes were made to the draft guidance. The objectives in the guidance are not compliance requirements. What controls are available and suitable, and the volume that is reasonable to manage, will be influenced by contextual factors such as those listed above. The objectives can help to show what remaining risk there may be left to manage, in collaboration with authorities, such as water corporations and councils.

The guidance recognises the new EP legislation and obligation to minimise risks so far as reasonably practicable. Developers may already be minimising risks so far as reasonably practicable supported through the various processes such as planning permit assessments and the Developers Services Schemes and precinct structure planning. However, the new guidance makes it clear that risks of harm from stormwater flows are an important consideration as part of minimising risks. This means that it is expected that whether small or large-scale developer, this is being considered and a proportionate risk assessment and controls are carried out.

Appropriateness of existing software tools

Issue

Many submissions highlighted the importance of modelling tools and concerns were raised over how they are referenced in the guidance. Also, while the Model for Urban Stormwater Improvement Conceptualisation (MUSIC) can model flows, submissions highlighted that applications for many smaller developments are often managed directly by the project architect/planner, who rely heavily on simple tools such as STORM which does not calculate flow.

Response

Changes were made to the draft guidance made in response to these issues. It was not the intent of the guidance to endorse a particular software tool. The final guidance has been changed to make it clear that the focus is on relevant modelling, which is appropriate and proportionate. What level of modelling will depend on the scale and risk from the development. DELWP will progress the issue of STORM functionality, updates and hosting arrangements.

It's expected that state of knowledge, including technology and tools available will continue to improve over time. The expectations regarding the level of detail of a risk assessment and modelling, is proportionate. Therefore, an assessor may determine that small, lower risk developments are not expected to engage in complex MUSIC modelling of flows. Regardless, there is good scientific understanding of what is required to manage flow. This includes the retention of pervious areas, stormwater harvesting and infiltration.

Implementation and ongoing maintenance of controls, roles and responsibilities, MUSIA, stormwater management plans

Issue

Some submissions requested clearer linkages between the guidance and other regulatory mechanisms to define the requirements for ongoing maintenance and operations of stormwater assets to achieve long-term benefits. Further to that, some submissions were seeking a greater emphasis on defined roles and responsibilities for the maintenance of the stormwater assets as outlined in the Melbourne Urban Stormwater Institutional Arrangements (MUSIA). Some submissions suggested exploring the inclusion of guidance in relation to evaluation, monitoring and maintenance of stormwater management assets.

Response

No changes to the guidance were made to the draft guidance in response to these issues. The importance of ongoing operation of assets is recognised in the guidance, with this also being a consideration regarding the implementation and suitability of controls, however, it is not the focus of the guidance. See page 4 of the final guidance and guidance scope.

More detailed guidance documents exist however, developed by water corporations and some councils, which provide advice on ongoing management and operation of stormwater management systems. For example, City of Port Phillip WSUD Guidelines, Melbourne Water WSUD maintenance guidelines(https://www.melbournewater.com.au/media/636/download), DELWP checklists and guidance for stormwater planning (https://www.water.vic.gov.au/liveable-cities-and-towns/stormwater/Stormwater-management-for-urban-development). There is also specific guidance on the maintenance of rainwater tanks by Smart Approved WaterMark (https://www.smartwatermark.org/smartwateradvice/saving-water-garden/rainwater/maintaining-rainwater-tank/).

Outlining roles and responsibilities for the ongoing maintenance of stormwater treatment assets is not the focus of this guidance. There is currently work underway focused on this, including a review of Melbourne Urban Stormwater Institutional Arrangements related to roles and responsibilities for the operation and maintenance of stormwater assets, see: https://www.water.vic.gov.au/liveable/stormwater-review

Existing obligations on councils to develop stormwater management plans, and for managers of assets to maintain those assets are set out in Clause 34 (3) and (4) of SEPP (Waters). These clauses have been saved in Transitional Regulations for two years (until 2023) from the commencement of the new Environment Protection Amendment Act 2018 to maintain existing obligations.

The transition of these obligations under the new environment protection framework will be investigated further through scoping work and future engagement. EPA will continue to examine the potential development of obligation orders for managers of land or infrastructure (OMLIs) where appropriate – this would be developed with the relevant land or infrastructure managers.

Developing state of knowledge and additional risk factors to consider

Issue

Some submissions queried what if science progresses regarding certain risks or identifies risks or evidence that isn't covered in the guidance.

Response

No changes were made to the guidance. The guidance relates to stormwater runoff from urban areas in Victoria. It addresses key environmental risks associated with generating new impervious surfaces, covering pollutant loads and flow impacts on the environment. The objectives are based on the best available science that are useable in modelling and risk assessment and support the broad audience across Victoria.

While the guidance covers a range of environmental risks, it provides environmental objectives for only a subset of these risks. The state of knowledge regarding risks may improve with time and techniques and technologies are expected to improve.

EPA Guidance is not the only source for the state of knowledge (https://www.epa.vic.gov.au/about-epa/laws/new-laws/state-of-knowledge-and-industry-guidance) and the new environment protection framework is based on the principles of continuous improvement. Knowledge may come from business and industry organisations, regulatory and government agencies and other independent and/or international organisations.

Construction and sediment control

Issue

Some submissions requested that more emphasis should be given to construction and minimisation of the construction phase's stormwater pollutants, such as sediments, given the significant quantities and pollution impacts that occur before impervious surfaces and permanent treatment assets are completed. There was also confusion over the draft guidance's statement that 'temporary environmental systems' were not the focus of the guidance.

Response

To avoid confusion, the reference to 'temporary' was removed from the guidance. The guidance recognises the risks and importance of appropriate controls being implemented during the construction phase however, it is focused on the built systems that manage the increased stormwater flows and pollutants from impervious surfaces. It provides links to the relevant EPA publications and resources that provide greater detail on appropriate controls to implement at the development site and may be useful references

for assessing or preparing a permit application. These pieces of EPA guidance support duty holders in managing their risk to prevent erosion and sedimentation and discharges to water.

EPA's *Civil Construction Building and Demolition guide* (CCBD guide) (publication 1834) (www.epa.vic.gov.au/about-epa/publications/1834) was published in November 2020 to support the industry to eliminate or reduce the risk of harm to human health and the environment. It helps inform the decisions and steps that the industry can take to manage their risk. It follows a risk-based approach to preventing harm in a structured way. It describes controls to minimise risks prior to impervious surfaces and the permanent treatment assets being built. The approach and steps taken may depend on the complexity as well as the nature of the risks.

The CCBD guide is the most relevant EPA publication to support the construction industry, building their state of knowledge, and is referenced directly in the guidance to ensure more information is provided on controls that can be put in place to manage risk in key areas including erosion and sedimentation. It addresses stormwater flow across a construction site, managing stockpiles and working within waterways, and includes guidance sheets.

In addition to the CCBD guide, EPA's online guide, How to control erosion and sediment from your business (https://www.epa.vic.gov.au/for-business/find-a-topic/erosion-and-sediment/advice-for-businesses/controls), sets out a risk-based approach to preventing and minimising impacts from erosion and sedimentation (https://www.epa.vic.gov.au/for-business/find-a-topic/erosion-and-sediment/advice-for-businesses). Melbourne Water provides information on how to prepare a site environmental management plan. (https://www.melbournewater.com.au/planning-and-building/developer-guides-andresources/standards-and-specifications/developsite.). Other key controls on impact of stormwater pollutants in the construction phase are set out under other frameworks including the Planning and Environment Act, such as site management standards and requirements for site management plans which describe how impacts from erosion and sediment will be managed.

Identifying priority urban stormwater management areas outside greater Melbourne

Issue

Some submissions were interested in the process to identify priority urban stormwater management areas outside of greater Melbourne.

Response

No additional information was added to the guidance, however, DELWP have advised that there are two processes that will provide an opportunity to further consider urban waterways and the management of stormwater in regional areas. Both the regional waterway strategy and the Victorian Waterway Management Strategy renewal processes will be used to explore the extent to which priority stormwater management areas outside of the greater Melbourne area can be identified. We understand that consultation, particularly with CMAs, is undertaken through both renewal processes and as such you will be able to assist in shaping what the process looks like.

Managing human health risks and waterway values

Issue

Some submissions highlighted the importance of being more explicit on the identification of risks to human health as well as references to specific waterway values that need to be considered during the risk assessment process.

Response

In response to this issue, the guidance has been revised to more clearly highlight human health and set out risks of harm to human health. This includes examples such as increased risk of gastroenteritis and skin irritations from urban stormwater.

Regarding waterway values, there is no change to the draft guidance. The guidance recognises that waterway managers (CMAs and Melbourne Water) identify specific, locally valued waterway values. Also, the general environmental values for water are set out in the Environment Reference Standards (ERS) and broadly cover social, economic and environmental values (EV) (a link to the appropriate ERS is provided in the guidance document). The performance management objectives in the guidance support protecting the EVs of water, noting however that the ERS gives ambient standards of waterways while the guidance is focused on performance management objectives (mean annual loads).

Importance of integrated water management, water sensitive urban design (WSUD), and ecologically sustainable development

Issue

Some submissions highlighted the importance of ecologically sustainable development, WSUD and undertaking collaborative planning with water corporations, local councils and developers using Integrated Water Management Framework (IWMF) principles to help understand the controls that are available and suitable, and also to maximise benefits for the community.

Response

Information was added in the guidance document to recognise the benefits of utilising Victoria's integrated water management framework to collaboratively develop water and land planning processes for urban stormwater management.

The guidance document recognises the importance of early engagement with councils and water corporations, particularly for higher risk developments. Similar to other controls that can be implemented to minimise risks from urban stormwater runoff, implementation of any WSUD features should be proportionate to the risk and also dependent on what is reasonably practicable.

The importance of ecologically sustainable development is recognised by the principles of the *Environment Protection Act*, and has also been recognised in the VPPs with recent updates and proposed changes Planning Victoria has more information. (www.planning.vic.gov.au/policy-and-strategy/environmentally-sustainable-development-of-buildings-and-subdivisions?_ga=2.52742250.33205976.1617143667-15716744.1581301828)

The guidance complements this.

Request for additional indicative management scenarios and infographics

Issue

Many submissions found the inclusion of infographics useful and helpful in demonstrating some different controls. Some submissions requested that even more infographics be developed to show a greater range of scenarios. Some submissions also had queries about the harvested amounts, and if the approaches in the examples must be copied.

Response

EPA welcomes the feedback that the scenario-based infographics are helpful. Although no additional scenarios have been added to the guidance prior to publication, EPA will consider the opportunity to develop additional infographics or scenarios for future revisions of the guidance and related material, drawing on suggestions and insights from submissions.

The scenarios presented in the infographics are examples only of common and effective controls and a system of controls must be chosen that is appropriate and suitable for the context and based on a risk assessment. All design responses require appropriate engineered design and investigations and to take into account relevant guidelines and standards.

The volumes harvested will be relative to the area of development (the absolute numbers are not important as they are relative to the unit area in the modelling). This will vary depending on climate as well as level of service. Storage sizes will need to be determined for any given development as they will vary with development and climate.

1. Appendices

1.1 Appendix A —Submissions received

Wimmera CMA

Our Ref: WCMA-97-63849
Contact Paul Fennell Date: 11/11/2020

Ms Sigourney Irvine
Senior Policy Officer
Policy & regulation Unit
Environment Protection Authority Victoria
Sigourney.irvine@epa.vic.gov.au

Dear Sigourney,

Draft Urban Stormwater Management Guidance

I wish to thank you for the opportunity comment upon the recently released draft guidance (publication 1739) to support the planning and design of new stormwater management systems.

I note the guidance has identified a requirement of a 'transparent process to identify priority areas for enhanced stormwater management outside of the greater Melbourne area' with respect to flow reduction for new developments.

Wimmera CMA welcomes the opportunity to work with the EPA and other stakeholders to ensure the guidance is appropriate for our region.

Yours sincerely

PAUL FENNELL
FLOODPLAIN MANAGEMENT TEAM LEADER

Our File: HCC19/111
Enquiries: Angela Ganley
Telephone: 9025 2322

Monday, 7 December 2020

Sigourney Irvine
Senior Policy Officer
Policy & Regulation Unit
Environment Protection Authority Victoria

Dear Sigourney

RE: DRAFT URBAN STORMWATER MANAGEMENT GUIDANCE

Thank you for the opportunity to respond to the *draft urban stormwater management guidance.* Hume City Council is committed to protecting and enhancing its waterways and working with other partners upstream and downstream to improve stormwater quality. Council supports the introduction of flow performance objectives into urban stormwater management, as the damage to waterways from increased flows due to urban development are clearly evident in Hume's waterways. Council has feedback on the sections on the draft guidance document outlined below.

1. Purpose and Scope

The scope of the guidance states that it does not apply to 'temporary environmental management systems used during the construction phase' and that this information is contained in other EPA guidance. Council would like to know:

- How is 'temporary' defined? Some developments areas are under construction for over 20 years, during which time the waterway values are irretrievably damaged. For example, Hume City Council has one greenfield estate with over 250ha of developed land, with about 90% of housing construction completed and occupied and no end-of-line treatment assets to meet the existing BPEM targets. There is a need to define the temporary period and hence when this guidance takes effect.
- Currently Hume City Council is seeking advice from the EPA on the definition of temporary for staged subdivisions and how Clause 53.18 measures come into force. It is clear from ongoing delays for the receipt of this advice that the EPA does not have a definition of the temporary construction phase.
- The performance objectives should be met at all stages of subdivision and development and that separating the terms into construction period and post construction places our waterway values at risk. While the methods to manage environmental impacts in construction, temporary and ultimate phases may be different, the same fundamental waterway values need to be protected.
- Is the other EPA guidance also under review for the temporary construction phase? Will there be new performance objectives developed for temporary construction phase?

The guideline scope being limited to 'new impervious surfaces' only will cause significant implementation problems in brownfield developments that are required to apply Clause 53.18. Council is already seeing developers try to avoid implementation of the current BPEM standards as is required by Clause 53.18 due to not 'increasing' impervious surfaces. Legal advice Council has received is that the new Clause 53.18 provisions apply in their fullest extent to redevelopment sites that are required to obtain planning permits. Narrowing the scope in this document undermines its value for this purpose.

Human health is mentioned in section 1.1 but is not addressed in the purpose. The risk to human health should be included in the purpose of this document.

2. Assess Risks: Factors to consider

a. Flow Performance objectives

Council may also have on-site detention requirements that exceed the flow performance objectives set out in the guidance document. In this case, Council requirements will apply. Could this also be noted in the guidance, particularly for development in existing areas with the 25% flow reduction objective?

The flow performance objectives in the stormwater priority areas in the Healthy Waterways Strategy apply across the sub-catchments identified by Melbourne Water. It may not be applicable to apply the proposed flow objectives at the development scale, as their achievement could be dependent on how the regional solution is implemented. For example, in the Sunbury Growth Area, contributions to the objectives are not the same in each estate but aim to meet the overall harvesting objectives when all estates are combined. Could note 2 to table 1 be adjusted to reflect this?

From the information given in the guidance document, it is difficult to know if the development is in a 50% or 90% flow reduction objective area. The Melbourne Water online mapping tool expresses the *Healthy Waterways Strategy* targets in terms of ML/ha/yr harvested &/or infiltrated, not in percentage flow reduction.

One of the concerns with the flow objectives being applied to average annual flows only is that large peak flow events rapidly modify and destroy the ecological values of the waterways. The *Review of Stormwater Science* appears to approach flow objectives from the perspective of maintaining geomorphological values, which can be maintained through average annual flow reductions. While these values are important, they are not analogous to protecting ecological values. A paper by Serena and Grant (2017) detailed how high flow events led to drowning of platypus burrows. In urban streams near Melbourne, nearly three times more juveniles were captured per breeding-age female in years when high-rainfall events did not occur in January or February than in years when at least one major storm was recorded. Given this, Council would like the impacts of peak flows on ecological values investigated and a determination made on whether peak flow objectives need to be set. This finding is particularly important given the recent scientific advisory committee findings under the *Flora and Fauna Guarantee Act*, that the Platypus should be listed under this Act. This is but one high profile example of the risk of additional peak flows and changing hydrological status to natural ecological conditions. The scientific advice for the setting of these objectives should be based on all available science, including the ecological parameters that support the flora and fauna of our rivers and streams.

The issue of changing hydrological condition on natural ecosystems such as wetlands and grasslands that depend on surface flows is not covered by this guidance document. There should be a note that states that maintenance of natural hydrological

conditions for retained vegetation should be a performance objective in redevelopment sites.

b. Other Risk Factors to Consider

Parts of Hume City Council's greenfield development areas contain sodic and dispersive soils. The guidance should include in the list of factors one that considers the soil types and the impact on sediment in run-off. The work on sodic and dispersive soils is ongoing but will, in future, need to be incorporated into the state of knowledge. Does all state of knowledge need to be in the form of an EPA guidance document? What is the process for Council to contribute to the state of knowledge?

Given the continuous and ongoing nature of industrial spills, fires and pollution events in the northern growth corridor, end of line structural controls should be deployed in the design of stormwater systems that allow for re-direction of contaminated stormwater in the event of an emergency. These events will inevitably occur (based on the past 10 years of experience at Hume), and so structural preparedness can assist in mitigating the environment harms from these events.

3. Implementing Controls

It would be helpful if the controls listed at the top of page 9 also listed which objective they contribute to achieving. The reason is to emphasise that these new objectives will require further interventions to meet the flow objectives beyond the wetlands and bioretention typically seen in greenfield subdivisions. Self-watering trees and sponges (or passive irrigation) should be explicitly named in the list of stormwater treatment examples on page 9

How are 'other water-sensitive urban design features' assessed for their contribution to the performance objectives? Are controls restricted to the those available in MUSIC, InSite or STORM, etc? How are new controls, e.g. passive irrigation of street trees, assessed and accepted as meeting the performance objectives?

Could the guidance include a note on the use of rainwater tanks and stormwater harvesting for irrigation in recycled water (third pipe) areas? This is a source of confusion for developers and Councils as it is commonly perceived (incorrectly) that water authorities do not allow rainwater tanks in mandatory recycled water areas. Is it EPA's understanding that a developer in a mandatory recycled water area could also mandate rainwater tanks to meet the quantitative objectives for stormwater? Has EPA discussed this issue with the water industry?

There are also significant concerns in relation to who is responsible for ensuring installation and maintenance of private rainwater tanks in greenfield development where individual house lots do not need planning permits and compliance is often handled by private building surveyors. If rainwater tanks become part of the stormwater management solutions who is responsible for undertaking compliance and enforcement of these assets at a lot scale?

In the hierarchy of control listed under Figure 2, could the guidance include reusing, as well as capturing stormwater? There is no point in capturing stormwater if it is not reused for net community benefit. The funding to facilitate the reuse of the stormwater is a major constraint. Policy change is needed to enable funding to facilitate reuse. When and how will this occur?

4. Indicative stormwater treatment scenarios

These scenarios are helpful in communicating the approach and objectives to urban stormwater management outlined in the rest of the guidance document, particularly for smaller developers that may not have access to specialist consultants. Council has the following comments and questions:

General issues with scenarios –

- The highest treatment scenario should come first in this run of scenarios.
- There should be a 90% flow reduction scenario to show how this can be achieved. This could be easily done by adapting scenario 3.
- There should be a redevelopment scenario from brownfield industrial to housing/mixed use to show that places like Fisherman's Bend still need to apply improved stormwater quality outcomes as per the requirements of Clause 53.18.

Scenario 2 and Scenario 3 – the harvested volumes of 22.5ML/yr and 30ML/yr respectively are very large and are more exceptional rather than indicative, e.g. if there is a large sports facility with an elite level playing surface. For context, the typical irrigation rate is 3.5ML/ha/yr so a 30ML/yr harvesting would be applied to 8.5ha of open space. Council's largest sporting precinct has a water budget of 25ML/yr so there would need to be an equivalent sporting precinct in the development to harvest these indicative volumes, which is typically not the case.

Scenario 3 – Inclusion of the Class A treatment facility and re-use scheme would be as directed by the relevant water authority. Why does this supply need to be used externally to the development? Is it not possible to inject into third pipe scheme and re-use within the development?

Scenario 4 – Advice needs to be provided on the risk of leaky tanks to the moisture differentials underneath housing slabs. Currently, there is significant risk alleged that street trees dry out the soil and cause cracking. Could the same occur with additional moisture near the house? Council is not saying that this should not happen, just that the building code might need to be updated to ensure that houses can be designed in a way that allows for moisture differentials.

Scenario 6 – Toilet flushing has a small demand relative to the catchment (roof area). There needs to also be another on-site use for the rainwater for industrial developments, otherwise the tank will just overflow to the stormwater drainage system.

Scenario 8 – The swale along the driveway to catch rainwater from the driveway presents some issues. In rainfall events above the design level this could cause flooding issues with the neighbouring property.

5. Review of Stormwater Science

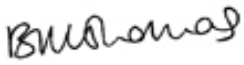
Hume City Council has been involved in studies to assess the impacts of synthetic pyrethroids on urban stormwater quality. Synthetic pyrethroids are used in large quantities in the build-out phase (housing construction) of greenfield development. These chemicals were found to be detected at levels which may have a significant adverse impact on the local receiving waterways and species within them.

Was this information considered in the setting of quantitative performance objectives? If the information was insufficient, then what further work needs to be done to develop a performance objective? Under the new General Environmental Duty approach, does this need to be incorporated into this guidance now or is there another way to include it in the state of knowledge for urban stormwater management?

The *Review of Stormwater Science* identifies several areas where there is insufficient evidence to inform performance objectives. Is EPA undertaking studies to fill the knowledge gaps identified in the *Review of Stormwater Science*? Where can Council get further details on these studies?

If you would like clarification or further information on the information contained in this letter, please contact Angela Ganley, Senior Sustainability Officer, on angelag@hume.vic.gov.au

Yours sincerely



BERNADETTE THOMAS
MANAGER SUSTAINABLE ENVIRONMENT

Sigourney Irvine
Senior Policy Officer
Policy & Regulation Unit
Environment Protection Authority Victoria

City of KINGSTON

25 November 2020

Dear Sigourney,

Re: Draft urban stormwater management guidance

Thank you for the opportunity to provide feedback on the EPA's Draft urban stormwater guidance, providing guidance to developers and associated entities on stormwater management from an authoritative entity like the EPA is warranted. The comments presented below represent the views of officers working at City of Kingston.

Although speaking to 'developers' as the primary target audience, the language and information included does not clearly define itself as appropriate for 'mum & dad' developers, nor large entities. This lack of clarity leads to the guidance being mixed, and incohesive, so potentially missing both audiences. The following comments do not seek to resolve this issue for the EPA, but to comment on the information as provided.

Minor edits

Pg 4 – 1. Purpose
Relevant parties

- The Victorian Building Authority (VBA) should also be included here, as Building Surveyors have a level of responsibility as well
- Needs to include a statement highlighting the Environment Protection Amendment Act 2018; and that minimising stormwater pollution lies with the owner / applicant to perform reasonable measures to prevent stormwater pollution. This imperative needs to be made clear.

Structure and wording

Pg 4 – 1. Purpose
Target audience – more consideration needs to be given to how this document can clearly address the needs of both small and larger scale developers, and their different capacities.

Pg 6 – 2 Managing urban stormwater risks

- This section needs to step through all the phases of risk management, from identifying hazards through to checking controls. It is incomplete to only provide guidance on the middle two steps.

Waterway values

- The risk management guidance states it is intended to be used to identify risks to 'waterway values' from stormwater runoff; however, waterway values are not clearly articulated early in the document, to enable a risk assessment to be conducted. They need to be included.
- Also, the risk assessment is to be conducted against an aim of minimising harm to human health – this needs to be articulated in the first step of using the risk management framework.

Pg 8 – 2.2 Implementing controls

- This section needs to be introduced with a paragraph reminding developers of the Integrated in IWM. It should not be a piecemeal exercise of pick and choose – but how can a suite of actions, working together in an integrated way, improve stormwater quality and reduce runoff, and even provide reuse opportunities.

Pg 10 – Indicative stormwater treatment scenarios

- These are useful, but this section should start with a brief description of what the scenarios represent.
- Suggest reordering to start with lot scale illustrations, building to larger elements
- The text in these images is too small and difficult to read
- Many of the larger scale images do not adequately represent IWM, for example, no street scale WSUD is shown.

- While these scenarios demonstrate reasonable measures for stormwater management, they should be introduced with wording to direct developers to relevant water authority and council requirements, as these differ between jurisdictions. Stronger guidance on communicating with local authorities early in the process is needed.

Thank you again for the opportunity to provide feedback, we look forward to the next iteration of the guidelines.

Regards

Helen Scott
Acting Team Leader, Environmental Planning

To whom it may concern,

It is recommended that the paragraph on tools is rewritten and that only recognised regulatory tools are included, i.e. MUSIC and STORM. A general reference to the potential for other tools to be developed or adopted may then be made.
To assess these performance objectives, use an appropriate software tool. The MUSIC (Model for Urban Stormwater Improvement Conceptualisation) stormwater model by eWater may be used to demonstrate compliance with all objectives. STORM has the capability to assess multiple objectives which it simplifies to a single result, the STORM score, to reduce complexity for the user. The existing web implementation of the STORM Tool currently does not cover flow volume as an objective although it could be adapted to do so. Other tools may also be made available by government or industry in future.

Kind regards,

Jake Barnes | Associate

Hi there

I am the Director of one of Victoria's leading ESD, WSUD and Waste Management Consulting firms, EcoResults. We have 12 staff and work on hundreds of projects each year, both in the planning and building approvals processes. We also run training sessions for Architecture and Planning firms and Professional Associations who want to learn more about ESD and WSUD in the Planning Scheme.

It is excellent that the BPEM guidelines are being updated. We recommend that the paragraph on tools is rewritten and that only recognised regulatory tools are included, i.e. MUSIC and STORM. A general reference to the potential for other tools to be developed or adopted may then be made. We would suggest the following:

> *To assess these performance objectives, use an appropriate software tool. The MUSIC (Model for Urban Stormwater Improvement Conceptualisation) stormwater model by eWater may be used to demonstrate compliance with all objectives. STORM has the capability to assess multiple objectives which it simplifies to a single result, the STORM score, to reduce complexity for the user. The existing web implementation of the STORM Tool currently does not cover flow volume as an objective although it could be adapted to do so. Other tools may also be made available by government or industry in future.*

We would like to take this opportunity to congratulate you on your work and the ongoing improvements to water quality and the environment around the state as a result. Don't hesitate to contact me further about this or any other matter.

Kind regards
Samuel Thomson | Director

To whom it may concern,

We are aware that the EPA guidelines relating to stormwater are currently being updated for the first time in 20 years.

We would like to recommend that the paragraph on tools be rewritten and that only recognised regulatory tools are included, i.e. MUSIC and STORM. A general reference to the potential for other tools to be developed or adopted may then be made.

The following suggested wording could be used:

"To assess these performance objectives, use an appropriate software tool. The MUSIC (Model for Urban Stormwater Improvement Conceptualisation) stormwater model by eWater may be used to demonstrate compliance with all objectives. STORM has the capability to assess multiple objectives which it simplifies to a single result, the STORM score, to reduce complexity for the user. The existing web implementation of the STORM Tool currently does not cover flow volume as an objective although it could be adapted to do so. Other tools may also be made available by government or industry in future."

Thanks in advance for your consideration.

Frater Consulting Services

Regards,

Joseph Oppedisano

General Manager

Frater Consulting Services

FRATER

FAO EPA Victoria

As consultants involved in delivering stormwater quality objectives in new developments we recommend the guidance allows for additional tools to be developed by industry for adoption as competent alternatives to the use of MUSIC and STORM to demonstrate compliance.

We note the existing web implementation of the STORM Tool does not cover flow volume as an objective although it could be adapted to do so. Permitting industry to develop alternative compliance tools motivates development of enhanced interfaces and features that may be more intuitive to use (i.e. less error-prone) and could be further extended to better optimise further outcomes serving other government objectives, such as maximising potable water conservation etc.

Regards
Mike

Mike Rainbow BEng CEng MCIBSE
Associate Principal
Ark Resources

West Gippsland
Catchment Management Authority

WGCMA Ref: WGCMA-F-2020-00854
Document No: 1
Date: 4 December 2020

OFFICIAL

urbanstormwater@epa.vic.gov.au

Sigourney Irvine
Senior Policy Officer
EPA Victoria

Dear Sigourney,

Regarding: Draft Urban stormwater management guideline

Thank you for the opportunity to comment on the EPA's '*Draft urban stormwater management guidance*', publication 1739, October 2020.

The Authority notes that the Guideline does not propose any changes to the existing targets for reduction of total suspended solids, litter, total nitrogen and total phosphorus, as described in the 1999 Urban Stormwater Best Practice Environmental Management Guidelines.

It is understood that the proposed 50 - 90% reduction in mean annual total runoff volume applies only to priority areas identifies in the Melbourne Water Healthy Waterways Strategy, and that a reduction target of 25% of mean annual total runoff volume applies to all other waterways.

The Guideline states that '*a transparent process is required to identify priority areas for enhanced stormwater management outside the greater Melbourne area*', however there is no detail about what this process might be, who would lead it, and when the process would be complete. WGCMA seeks clarification of the details of this process.

WGCMA would be pleased to work with EPA to identify high priority waterways in the West Gippsland region.

We commend the EPA on the development of this Guideline, and we will use our statutory role to encourage developers to implement the Guideline, to improve waterway health.

Should you have any queries, please do not hesitate to contact Penny Phillipson on 1300 094 262 or email planning@wgcma.vic.gov.au. To assist the Authority in handling any enquiries please quote **WGCMA-F-2020-00854** in your correspondence with us.

Yours sincerely,

Adam Dunn
Statutory Planning Manager

EPA Vic - Publication 1739 Feedback

ABN: 95 656 703 998

7th December 2020

To: **Sigourney Irvine**
Senior Policy Officer, Policy and Regulation Unit
Environment Protection Authority Victoria
urbanstormwaterbpem@epa.vic.gov.au

From: **Michael Mag**
BSc, BE(Civ)(Hons), MAdvCivWaterEng
Stormy Water Solutions

Valerie Mag
BE(Hons), MEngSc
Stormy Water Solutions

Re: Comments and Feedback
Draft Urban Stormwater Management Guidance (Publication 1739)

Dear Sigourney,

Thank you for the opportunity to provide feedback on the Draft urban stormwater management guidance (guidance document), released to industry on 21 October 2020. This is an important document and Stormy Water Solutions (**SWS**) is pleased that the Environmental Protection Authority (**EPA**) Victoria has initiated the large task of updating the 1999 Urban Stormwater Best Practice Environmental Management Guidelines (**BPEMG**).

SWS has been involved in the Water Sensitive Urban Design (**WSUD**) industry for over 17 years. We are leaders in the field and technical experts on WSUD practices. We routinely provide training to Council's, the Local Government Industry Design Association, Catchment Management Authorities (commonly Melbourne Water) and other private consultants on WSUD and other urban drainage matters. We also have been fortunate to have been involved in numerous Council and developer WSUD audits over the last 10 years. We are also often the 'independent' experts in projects, informing and guiding Council, Melbourne Water, and developer interests in achieving what is best for our society and the environment. This uniquely places us within the industry as designers who also listen to (and are often a voice for) the industry.

Our feedback on the Draft Urban Stormwater Management Guidance (**DUSMG**) (Publication 1739) can be summarised into six key areas as outlined below:

1) The General Environment Duty (GED) and how the DUSMG will be enforced

SWS would request that the EPA Victoria provide greater clarity on the GED and how the new DUSMG is enforced/mandated. The industry is extremely 'comfortable' with how the 1999 BPEMG was mandated through the state planning provisions. Whereas SWS (and all people we have spoken too) are confused as to how the new GED will be enforced or mandated.

Perhaps, if the EPA could provide a flow chart that compares how the new DUSMG will be enforced or mandated compared to the 1999 BPEMG. this may help clarify this matter. A sample schematic of that expected (for the 1999 BPEMG) is shown in Figure 1. It would greatly assist the industry if the EPA could add to this how the new DSUMG will be integrated into the state planning systems.

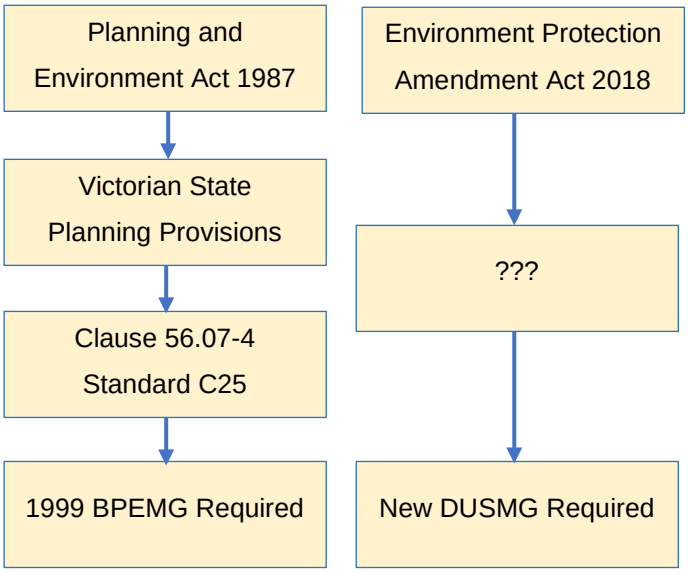


Figure 1 Sample governance flow chart

2) Reasonably Practicable and Performance Targets as Ranges

It is SWS's understanding that 'Reasonably Practicable' relates to minimising the effects of a risk. However, when implemented under planning matters, there are multiple risks, the most prominent being 'to the environment' and 'cost'. However, the relative weighting of these two factors will vary significantly from the EPA, referral authorities, developers, or other parties.

What is reasonably practicable to the EPA is likely not reasonably practicable to a developer. What is reasonably practicable for a commercial development company compared is likely not reasonably practicable to a 'mum and dad' small subdivision developer.

In its current form, the DUSMG is extremely vague regarding 'Reasonably Practicable'. This may create Victorian Civil and Administrative Tribunal (**VCAT**) hearing for almost every project.

In planning matters, a clear, definitive, minimum standard is required, such as a 45% reduction in the mean annual load of Total Nitrogen. Referral authorities can then determine solutions for meeting that standard that are 'Reasonably Practicable' (i.e. Drainage Schemes and/or contributions) so as to achieve the objective.

By having a 'Reasonably Practicable' as a 'objective target' (or 2 – 3 targets for different scenarios), confusion, noise, and the resultant conflicts between parties (and the consequent VCAT proceeding) will be minimised.

3) **Performance Objectives – Flow or Volume Reduction Indicator Clarity**

SWS would recommend the EPA be clear as to whether they are referring to stormwater 'flow' reductions, or 'volume' (assumed to be representative of the 'flow regime') reductions and be consistent in their terminology. Though interconnected and related, designing to mitigate flows is not the same as designing to mitigate volumes.

There is are important distinctions between designing for 'flow' targets and 'volume' targets. Flow targets are usually associated with a flood risk and classified by a given Annual Exceedance Probability. Volume targets are often represented by a mean annual (or seasonal) runoff volume and for simplicity are an aggregated measure (that may not necessarily be reflective) of the impacts on a 'flow regime'.

4) **Performance Objectives – Theoretically Achieving the Objectives**
Baseflow Contribution

Currently 'Section 3 – Indicative Stormwater Treatment Scenarios' of the DUSMG provides no examples of how to meet a baseflow objective. This should be provided.

5) **Performance Objectives – Theoretically Achieving the Objectives**
Flow (Volume) Reduction

Achieving a flow (volume) reduction is extremely hard without a large water demand. In urban stormwater, generally it can be said we have an over supply of water, that we can easily store. However, finding suitable demands (uses) for the stormwater to achieve specific objectives will be problematic, particularly at varying spatial scales.

The EPA should be providing more guidance on how stormwater re-use demands can be generated. It is expected, as per 'Section 3 – Indicative Stormwater Treatment Scenarios', a significant amount of private lot-based assets (tanks) will be required to service these demands. At the present time, many catchment management authorities and Councils do not accept tanks in water balance modelling as they assume, in private ownership, most will not be 'plumbed in' or maintained.

This means most harvesting assets will probably (ultimately) be Council managed. Of particular concern is that maintenance and enforcement is foundational to the long-term success of stormwater management initiatives. Planning requirements, if not coupled with a strategy to resolve current challenges with maintenance is considered futile. At present, councils are unable to dedicate resources to ensure maintenance and enforcement of existing assets, let alone thousands of more assets.

The EPA should be leading the industry in developing clear roles, responsibilities, and funding mechanisms (both initial and ongoing) in order to ensure that the targets are achieved not only in the modelling software, but also on the ground for their entire engineering life.

6) Performance Objectives – Actually Achieving the Objectives
Proof of Concepts

Tied into theoretically achieving objectives (i.e. modelling) is providing a proof of concept(s). SWS envisage that these would be demonstrations of sites with 25%, 50% and 90% flow reduction, as well as demonstration of the baseflow contribution.

Historically, when the 1999 BPEMG was first beginning to be implemented, numerous agencies heavily invested in the Lynbrook estate to show that the concepts could work.

SWS notes that there is the Aquarevo estate currently that achieves flow (volume) reduction objectives. However, the methods the Aquarevo estate utilise to meet these objectives are significantly more complicated (in modelling, governance and maintenance) than the almost all the examples provided within 'Section 3 – Indicative Stormwater Treatment Scenarios'. If this is to be the new normal, more guidance and leadership is required by the EPA.

SWS is happy to discuss any of the comments above further if required. Please do not hesitate to get in contact. We are all in this together and want to see the best outcomes for all.

Regards,

Michael Mag
Stormy Water Solutions
0401 861 301
michael.mag@stormywater.com.au

Valerie Mag
Stormy Water Solutions
0412 436 021
val.mag@stormywater.com.au

CITY OF MELBOURNE

City of Melbourne
GPO Box 1603
Melbourne VIC 3001
Telephone (03) 9658 9658
Facsimile (03) 9654 4854
DX210487
ABN 55 370 219 287

14 December 2020

Urban Stormwater Team
EPA
GPO Box 4395
Melbourne 3001

Dear Urban Stormwater team.

SUBMISSION TO DRAFT STORMWATER MANAGEMENT GUIDANCE

The City of Melbourne is pleased to provide a submission to the EPA on the Draft Urban Stormwater Management Guidance. We congratulate the EPA on the comprehensive work that has informed this document. This guidance aligns strongly with City of Melbourne's vision for a healthy city in a healthy catchment and supports our objectives for clean and healthy waterways and reduced exposure to flood risks.

Our Municipal Integrated Water Management Plan sets targets and an action plan to improve stormwater quality, increase permeability and alternative water use and to reduce flood exposure. City of Melbourne delivers projects to reduce the risks associated with stormwater and through the Melbourne Planning Scheme Clause 22.23, requires that private development reduce their impacts through water sensitive urban design. We welcome any support that we can provide our development community to address the stormwater risks associated with their developments.

We believe the guidance document would benefit from the following inclusions to maximise its impact for our development community:

1. Scenarios related to metro context.

The Indicative Stormwater Treatment Scenarios are engaging and a useful starting point for addressing the stormwater risks associated with various development types. However the current examples are very green field focused. Although the types of development seen in City of Melbourne may not always generate additional impervious surface, they still require a BPEM response to their planning application. Many developments face constraints relating to contaminated land or the local geology. City of Melbourne, in partnership with City of Port Phillip, DJPR and Southeast water have recently completed relevant case studies for development in Fishermans Bend that may assist in developing metro scenarios.

Recommendation:

- Include development scenarios likely to occur in more metropolitan areas of Victoria including Central City mixed use developments and examples of alterations and additions to existing buildings.

2. Outline of the risks associated with groundwater and seepage water.

A risk we face in the City of Melbourne is groundwater and seepage of water from contaminated soil infiltrating into basements and building sites that involves excavation for structures below native surface levels. This is not only a risk to local waterways but also to any stormwater harvesting assets located within the same catchment. City of Melbourne has developed Groundwater Management Guidelines which clearly state the discharge of groundwater and basement seepage is not permitted. We welcome working with the EPA on consistent advice to developers around this risk.

Recommendations:

- Provide clear guidance to developers about the risks associated with groundwater and information on how to avoid the need to discharge to stormwater systems.

3. A consistent position on the use of proprietary products.

The range of proprietary products that claim to reduce risks associated with stormwater is rapidly growing. There is confusion within the development community about whether such products are an acceptable measure to meet stormwater treatment requirements. There is inconsistency between councils around whether these products should be accepted and whether they are effective in the long term given the significant maintenance they require. It would be helpful to understand EPAs position on these products forming part of the treatment train.

Recommendation:

- Provide information within guidance document about EPAs assessment of proprietary products forming part of a stormwater treatment train.

4. Consideration of the treatment requirements of rainwater collected from multipurpose roof spaces.

All development scenarios within the guidelines recommend rainwater tanks plumbed to toilet flushing or other suitable reuse. We are finding that more and more roof spaces are being used for gardens, bbq areas and places for people to congregate. While this practice has social and environmental benefits, it does make the collection of rainwater for indoor water use much more complicated requiring the use of UV disinfection or equivalent treatment. This additional treatment may not be cost-effective or energy efficient in all cases. Many developers do not consider these costs, or the spatial requirements of treatment plant. There is very little research into the pollutant load from trafficable roof space and we may not need such intensive treatment of this water for toilet flushing and washing machines.

Recommendations:

- Provide a clear note within guidance document that water from trafficable roof areas cannot be used for indoor non potable use without disinfection.

- Consider a risk assessment process (based on Quantitative Microbial Risk Assessment) to determine if the water from trafficable roof areas would be safe for indoor non potable use without UV disinfection.

5. Recognition of the need for ongoing governance

We have found that the biggest risk associated with all stormwater treatment systems whether on public or private land is inadequate operation and maintenance. Far too often, systems are installed and ignored. Rainwater tanks can be disconnected, gutters blocked, inlets to raingardens and wetlands not cleared. We recognise it is not the intent to provide guidance for ongoing management and operations, but we see the need for the risk of inadequate governance to be highlighted at this stage of the process. Consideration of the ongoing requirements may influence the types of treatment options installed.

Recommendation:

- Highlight the importance of ongoing operation and maintenance to ensure the stormwater risks to waterways are mitigated in the medium to long term.

6. Where to get more information

The information within this guidance is a useful starting point for developers and it would be good to direct them to where they can get further information or advice on the types of consultants that can support them in developing a stormwater response. For example Melbourne Water or their local council are likely to have further details or local considerations.

Recommendation:

- Include a “Further Information” section with links to key documents and websites.

If you would like to discuss any aspect of this submission, please contact Penny Ball, Water Sensitive City Lead on 9658 8663. We would welcome the opportunity to discuss our recommendations with you in more detail. In the meantime, we look forward to continued involvement in the Urban Stormwater Management Guidance process and other related work that EPA has underway.

Yours sincerely

Vicki Barmby

Manager – Climate Adapted and Water Sensitive City
Climate Change and City Resilience

Telephone 9658 8733
E-mail vicki.barmby@melbourne.vic.gov.au
Website www.melbourne.vic.gov.au

DM 14176657

Submission on behalf of Microburst Software on the Draft urban stormwater management guidance

It is excellent to see the objectives for stormwater being updated after 20 years since the original Best Practice Environmental Management Guidelines for Stormwater were established and following more than seven years of review to confirm the proposed revisions.

It has long been recognised that changes in hydrology adversely impact on urban waterways and the introduction of volume reduction objectives is an important step in starting to address these.

We consider that the following key points are essential:

1. Flexibility for the future is preserved for a range of responses and tools
2. The objectives are statutory obligations embedded within the planning system
3. Clear and unambiguous flow reduction performance objectives exist for any given site

Flexibility for the future is preserved for a range of responses and tools

Flexibility may be preserved by allowing a range of potential responses, as well as tools for demonstrating compliance, subject to approval of these by the relevant authorities.

The paragraph on tools under 'Metrics to assist you to evaluate risk of harm' must be completely rewritten.

It is recommended that only recognised regulatory tools are included, i.e. MUSIC and STORM.

What is Insite? We understand this tool is currently adopted in South Australia and has no more standing in the Victorian planning system than S3QM (www.s3qm.com.au) which has been adopted in NSW. Why is one tool mentioned and not the other? There are also other potential tools that exist. Is this statement implying adoption of Insite without independent peer review by recognised industry experts or due tender process? We are of the understanding the recent DELWP tender process for a revision of STORM concluded without a preferred contractor being appointed. As examples of other tools under development, please see www.stormcalculator.com.au, currently under development by Microburst Software and also https://locatemi.com.au/. It would seem prudent to keep the industry's options open at this time.

Please contact us if you would like assistance with revising STORM to include flow volumes.

Recommendation: It is strongly recommended the statement about InSite and all references to it are deleted.

It would be best to make a general statement that other potential tools exist. While government support to develop tools for compliance assessment for a new legislated requirement would seem prudent, the market may rise to meet the need in the continuing absence of such support.

Recommended revised wording:

To assess these performance objectives, use an appropriate software tool. The MUSIC (Model for Urban Stormwater Improvement Conceptualisation) stormwater model by eWater may be used to demonstrate compliance with all objectives. STORM also has the capability to support multiple objectives which it simplifies to a single result – the STORM score to reduce complexity for the user. The existing web implementation of the STORM Tool currently does not cover flow volume as an objective although it can readily be adapted to do this.' Other tools may also be made available by government or industry in future although these do not yet have regulatory support.

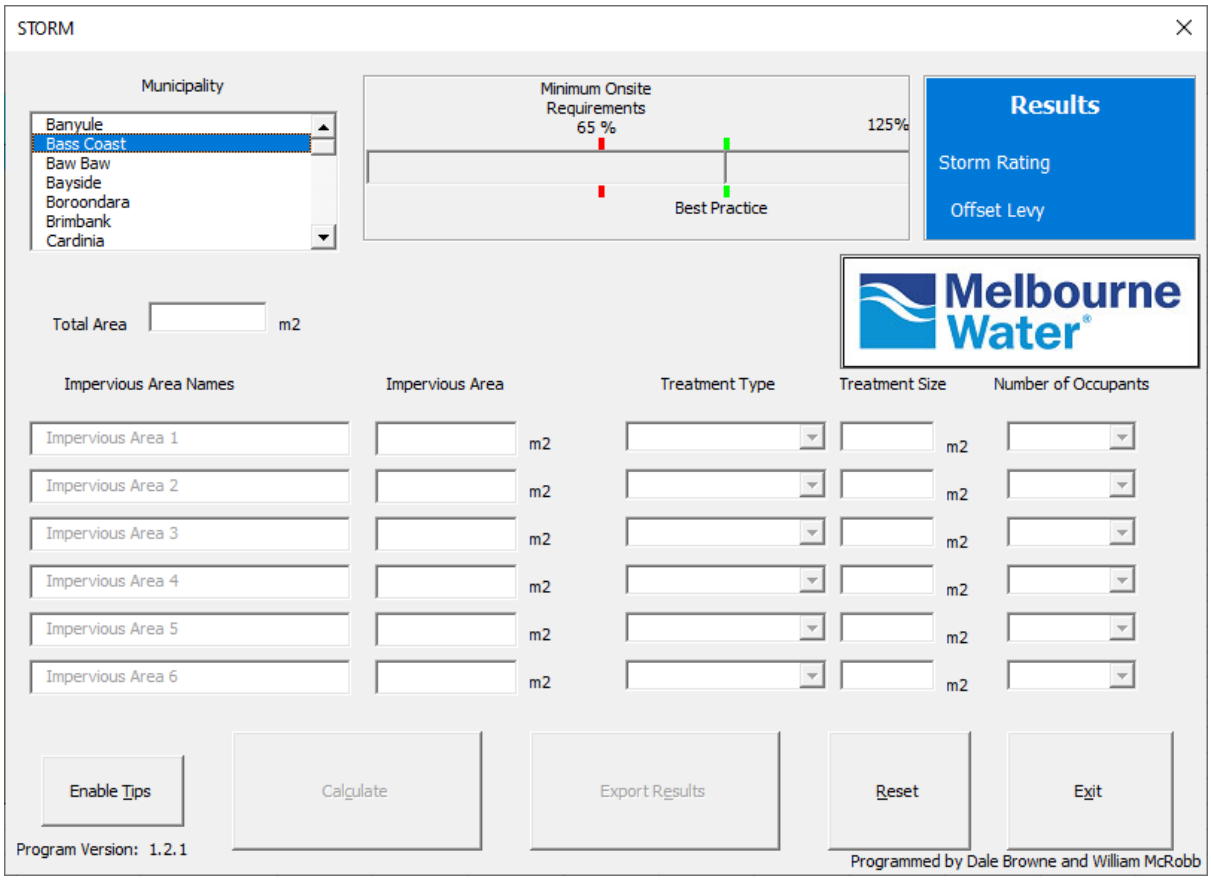


Figure 1 The interface for the original spreadsheet version of STORM

The objectives are statutory obligations embedded within the planning system

It is unclear what status of the 'Draft urban stormwater management guidance' will have in the planning system. To be effective, they must be clear statutory requirements. Objectives that are aspirational, optional, uncertain, ambiguous or in any way difficult to assess by planners are at risk of simply being ignored by most planning authorities or inconsistently and ineffectually applied at best.

EPA need to clearly and confidently set out the rules of the game. The market and industry may grumble but they will follow these, innovate and find solutions for the objectives set.

Recommendation: To give the objectives in the 'Draft urban stormwater management guidance' clear standing within the Victorian planning system equivalent to the Best Practice Environmental Management Guideline objectives.

Clear and unambiguous flow reduction performance objectives exist for any given site

The proposed flow objectives provide options for 25% or a range of 50-90%. It is unclear what the basis is for determining which of these should be applied.

Developers, consultants and planners attempting to use these guidelines will be much happier and effective if there are clear requirements without ambiguity or uncertainty where possible.

Please tell us that these are the objectives for new development, these are the levels that must be met and under what circumstances there may be variations or scope for discretion (preferably limited).

While recognising the importance of the new risk based framework and placement of the duty of care upon the proponent, leaving the level of stormwater flow reduction to what is 'reasonably practicable' simply creates a race to the bottom. Clear expectations should be set.

It is recommended the level of reduction to be achieved (i.e. where it sits within the 50-90% band) is clearly and explicitly based on assessment of the relevant receiving waters *by the authorities* and is set on a catchment or sub-catchment basis as a firm number so there is clarity and equity for all.

This should be clearly referenced to a strategy or objective established by the responsible catchment manager, for example in the case of Melbourne Water the Healthy Waterways Strategy. It is already available so please spell it out.

For areas where it is not already known, a clear potential process should be identified. It should then be expected that the CMA's around Victoria would undertake catchment assessments and establish what the flow objectives are for various waterways within their area of responsibility.

We recognise this process may take time and initial default assumptions may be needed to allow time for this to occur, adopting a precautionary principle approach for known high value waterways. This would preferably be conservative as it will push the CMA's to do their assessments.

Discretion may be made available for limited sites where it is genuinely impractical (not just a failure to provide space for water management).

The above does not release the developer and property owner from their obligations to exercise their duty of care and to consider whether more needs to be done above and beyond what they have been required to do by the authorities.

Recommendation: Clearly specify the rules for determining what flow objective is applicable where, how different areas are differentiated, what the process is for setting objectives in catchments where it is not yet determined and what the 'default' is until this occurs.

To EPA,

Thank you for the opportunity for us to submit our comments re the EPA's Draft Guidance for Urban Stormwater Management. Please see feedback from Mornington Peninsula Shire Council's (MPSC) below:

MPSC supports the newly proposed EPA's Draft Guidance for Urban Stormwater Management with the following recommendations/questions:

- Requires compliance through VPP to give the new flow targets legs;
- Requires a minimum flow target rather than a range;
- Question: Is the introduction of "as far as reasonably practicable" an attempt to align with the General Environmental Duty in the new EPA Act?
- The use of "as far as reasonable practicable" is acceptable to MPSC as this is also how we are currently dealing with the BPEM stormwater quality targets;
- Requires more examples of application at different scales;
- Supporting tools such as STORM needs to be updated to inform assessment of applications;
- Requires full commitment and support from State Gov to help deliver this guideline objectives.

FYI, MPSC has also provided input into the Stormwater Victoria's submission and most of our feedback here are consistent with theirs.

If you have any questions, please feel free to contact me.

Thanks and Regards,
Brenda

BRENDA LEE | Integrated Water Management Officer

Stormwater Best Practice Environmental Management (BPEM) Review

Submission to the Environment Protection Authority on draft Urban Stormwater Management Guidance
December 2020

Rainwater Harvesting Australia[1]

Introduction

Thank you for the opportunity to make a submission.

There are some great strengths in the draft Urban Stormwater Management Guidance particularly in the Quantitative Performance objectives and use of the Insite tool.

The EPA may need to reconsider its role in reviewing the BPEM, providing advice on stormwater management and the range of sources on which it is relying.

The risks associated with stormwater and climate change require further assessment and articulation in the BPEM.

The EPA has articulated important science to protect the Victorian community. The pathway to implement this science and review the BPEM should be made clear to all Victorians.

Strengths of the Management Guidance

The baseflow and flow reduction targets recognise the importance of managing stormwater volume as the primary driver for pollutants, flood risk and waterway ecologies and represent a major step forward in managing stormwater in Victoria.

The importance of managing stormwater volume, and the subsequent changes to stormwater management approaches and infrastructure are hard to overstate and the EPA is commended for bringing stormwater management advice in Victoria more in line with best practice.

The indicative stormwater treatment scenarios are also a major step forward in Victoria recognising a broader range of stormwater management solutions including rainwater harvesting, wetlands, raingardens, permeable pavement, vegetated swales and capturing rainwater to enhance local waterways and blue and green elements of the development. The scenarios are clearly based on modelling to demonstrate the infrastructure will deliver the required outcomes. Recognising different approaches for greenfield, infill and industrial development is also commended.

[1] All members of the rainwater harvesting industry have a commercial interest in this submission.

The reference to the InSite tool for assessing the performance objectives provides an important technical link to the stormwater standard Australian Rainfall and Runoff Guidelines 2019.

EPA role in reviewing the Best Practice Environmental Management Guideline

The need to review the Best Practice Environmental Management Guidelines (BPEM) was identified by the Improving Urban Stormwater Management Advisory Committee in 2018[2]. The MAC identified:

Current arrangements for managing stormwater in new developments in Victoria are inadequate for meeting the Victorian Government's policy objectives of protecting the long-term health of urban waterways and bays and for maintaining the resilience and liveability of our towns and cities, particularly with future population growth and climate change.

Recommendation 10 – Set stronger, place-based BPEM stormwater performance objectives: That the EPA consider place-based, and flow, stormwater performance objectives as part of its current review of the BPEM, to protect the ecological health of sensitive downstream waterways and bays, enhance amenity and recreational values and reduce flooding.

The BPEM was written in 1999 and is the cornerstone of stormwater management for development in Victoria because it is the only stormwater standard referred to in Victorian planning schemes. The MAC identified that the EPA was reviewing the BPEM in 2018.

The role of the EPA

The Independent Inquiry into the EPA defined the following roles for the EPA

The EPA as a science-based regulator[3]

The community expects the EPA to apply its expertise to identify and assess environmental risks, address economic, social and environmental considerations, and then determine the appropriate outcome for '… community wellbeing and the benefit of future generations'.[12] Protecting the environment is difficult. Risk can never be entirely eliminated. And how do the costs of vigilance weigh against the benefits? Weighing the risks, costs and benefits of environmental regulation is further complicated by scientific complexity and uncertainty.

The capacity to make these assessments is the EPA's defining characteristic. The EPA is a science based regulator, assessing risk and determining acceptable standards of pollution control, management and mitigation. The trust that Victorians place in the EPA is founded on their confidence in the EPA's scientific expertise, which sets the EPA apart from other Victorian regulators.

We congratulate the EPA on taking a science based approach to stormwater management outcomes in the draft guidance. In this regard we consider that the role of the EPA is to determine the 'acceptable standards of pollution control, management and mitigation' for stormwater management from new development. This is a complex modelling task requiring a detailed assessment at a local level in order to achieve the place-based

[2] State of Victoria. (2018). *Improving Urban Stormwater Ministerial Advisory Committee report*
[3] Ministerial Advisory Committee. (2016). Independent Inquiry into the Environmental Protection Authority. Environment Protection Authority

outcomes recommended by the MAC and weigh up both the costs of stormwater management and the community risks and benefits. This is not a role a land use developer can take due to their commercial conflict of interest in investing in stormwater management which reduces their return and profit.

However once the EPA have determined what those stormwater outcomes should be the land use developer could decide how to achieve those outcomes using a 'reasonably practicable' test.

We understand the current EPA course of action is to consider the draft guidance. No change to the BPEM or planning scheme provisions is proposed at this time. If the role of the EPA is to use their scientific expertise to determine acceptable standards then the EPA has not provided a revised BPEM to protect the interests of the people of Victoria. We request that a course of action to implement the draft guidance in the form of a revised BPEM be planned and implemented.

We have reviewed the 'Review of Stormwater Science' prepared for the EPA. We recommend the EPA consider the Australian Rainfall and Runoff Guidelines 2019[4] prepared by Engineers Australia which is the best practice standard for stormwater management in Australia. We also recommend the work of Professor PJ Coombes including 'The Greater Melbourne Alternative Water Plan[5]' and 'Status of transforming stormwater drainage to a systems approach to urban water cycle management – moving beyond green pilots.'[6]

Climate Change

According to the Insurance industry the outlook for damaging climate change is rapidly worsening[7] and one of the key impacts will be in stormwater as a result of the combination of more intense rain events, more impervious urban surfaces and inadequate existing stormwater infrastructure.

Our assessment of this report is that urban areas that previously experienced low or moderate levels of risk may now be facing high and potentially unacceptable levels of risk. This may be expressed by these areas becoming 'uninsurable' which is defined as premiums exceeding 1% of the cost to replace the property.

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[4] Ball, J., Babister, M., Nathan, R., Weeks, W., Weinmann, E., Retallick, M., . . . (Editors). (2019). *Australian Rainfall and Runoff: A Guide to Flood Estimation.* (B. M. Ball J, Ed.) Commonwealth of Australia (Geoscience Australia)

[5] Urban Water Cycle Solutions, & Thirsty Country. (2017). The Greater Melbourne Alternative Water Plan. Newcastle: Urban Water Cycle Solutions

[6] Coombes, P. J. (2018). Status of transforming stormwater drainage to a systems approach to urban water cycle management – moving beyond green pilots. Australasian Journal of Water Resources, 22:1, 15-28

[7] Bruyère, C., Buckley, B., Prein, A., Holland, G., Leplastrier, M.,. (2020). *Severe weather in a changing climate, 2nd Ed.* Insurance Australia Group. doi:10.5065/b64x-e729

One of the consequences of this issue may be that the planning controls which were previously appropriate are no longer best practice. This creates a new urgency for the review of the BPEM.

Another consequence of the IAG report is the need to address existing urban areas, not to reduce the impact of new development but to reduce the potentially much increased impacts of development already approved. The need to 'retrofit' existing urban areas is already being considered by town planners[8] and by Knox City Council (Sub catchment 913). Given that changing urban form can take decades, a long-term strategy will be required. If the EPA is taking the role as the science-based regulator for stormwater it will need to provide advice to urban land managers in existing urban areas on the need to address climate change challenges that already exist and will worsen in future.

The lack of climate change assessment and consideration in the draft management guidance and the BPEM review should be reconsidered.

Conclusion

The need to review the BPEM and set new standards for stormwater management in Victoria is increasingly urgent. The draft management guidance is an important step in the right direction and we congratulate the EPA on this development.

The EPA has articulated important science to protect the Victorian community. The Minister for the Environment is requested to articulate the pathway to implement this science and review the BPEM to protect the Victorian community and environment.

Bibliography

Argue, J.R. (2017). *Water Sensitive Urban Design: basic prodecures for 'source control' of stormwater - a handbook for Australian practice. .* Adelaide: Urban Water Resources Centre, University of South Australia, Adelaide, South Australia. In collaboration with Stormwater Industry Association and Australian Water Association. .

Australian Senate. (2015). *Stormwater Management in Australia. Environment and Communications References Committee of the Australian Senate. .* Commonwealth Government of Australia.

Ball, J., Babister, M., Nathan, R., Weeks, W., Weinmann, E., Retallick, M., . . . (Editors). (2019). *Australian Rainfall and Runoff: A Guide to Flood Estimation.* (B. M. Ball J, Ed.) Commonwealth of Australia (Geoscience Australia).

[8] Jason Byrne. (2018, July). An update on Hobart's floods: Planning Perspectives. *Planning News, 44*(No.6), p. 23

Barry, M. E., & Coombes, P. J. (2018). Planning resilient water resources and communities: the need for a bottom up systems approach. *Australasian Journal of Water Resources 22(2)*, 113-136.

Bruyère, C., Buckley, B., Prein, A., Holland, G., Leplastrier, M.,. (2020). *Severe weather in a changing climate, 2nd Ed.* Insurance Australia Group. doi:10.5065/b64x-e729

Coombes, P. J. (2018). Status of transforming stormwater drainage to a systems approach to urban water cycle management – moving beyond green pilots. *Australasian Journal of Water Resources, 22:1*, 15-28.

Coombes, P. J., Barry, M., & Smit, M. (2018). Systems Analysis And Big Data Reveals Benefit Of New Economy Solutions At Multiple Scales. *WSUD 2018 & Hydropolis conference.* Perth: Engineers Australia.

Coombes, P. J., Roso, S., & Editors. (2019). *2019 Runoff in Urban Areas, Book 9 in Australian Rainfall and Runoff, - A Guide to Flood estimation.* Commonwealth of Australia (Geosciences Australia), Australia.

Coombes, P., Smit, M., & Macdonald, G. (2016). Resolving boundary conditions in economic analysis of distributed solutions for water cycle management. *Australian Journal of Water Resources*, Vol 20, 11-29.

Jason Byrne. (2018, July). An update on Hobart's floods: Planning Perspectives. *Planning News, 44*(No.6), p. 23.

Ministerial Advisory Committee. (2016). *Independent Inquiry into the Environmental Protection Authority.* Environment Protection Authority.

Planning, Development and Infrastructure Act . (2016). State of South Australia.

Rossrakesh, S., Walsh, C., Fletcher, T., Matic, V., Bos, D., & Burns, M. (2012). *Ensuring Protection of Little Stringybark Creek - Evidence for a proposed design standard for new developments.* The University of Melbourne.

State of Victoria. (2018). *Improving Urban Stormwater Ministerial Advisory Committee report.*

Urban Water Cycle Solutions, & Thirsty Country. (2017). *The Greater Melbourne Alternative Water Plan.* Newcastle: Urban Water Cycle Solutions.

Walsh, C., Leonard, A., Ladson, A., & Fletcher, T. (2004). *Urban stormwater and the ecology of streams.* Canberra: CRC for Freshwater Ecology, CRC for Catchment Hydrology.

WatersEdge
101 Wells Street
Frankston VIC 3199
PO Box 2268
Seaford VIC 3198 Australia
Telephone +613 9552 3000
southeastwater.com.au

8 December 2020

Sigourney Irvine
Senior Policy Officer
Policy and Regulations Unit
Environment Protection Authority Victoria
(electronically to urbanstormwaterbpem@epa.vic.gov.au)

Hello Sigourney,

Submission to Draft Urban Stormwater Management Guidance

Thank you for providing us the opportunity to review the draft Guidance for urban stormwater management and make a submission.

South East Water is highly supportive of efficient management of stormwater for providing multiple benefits to the community and the environment at the least community cost. We are partnering with councils within our service region, Melbourne Water, as well as many other agencies to achieve Integrated Water Management outcomes through combination of multiple water services including stormwater harvesting and reuse.

We support the intent of this document, and the EPA's efforts to implement an important recommendation of the Stormwater Ministerial Advisory Committee. Please find below a summary of the key areas where we see opportunities for further improvement in this guidance document at a high level. Other general and scenario-specific feedback are included in the subsequent sections.

Stormwater as a valued resource
The document does not emphasise multiple benefit solutions that reduce stormwater pollution through maximising stormwater reuse. This implies that many solutions proposed are likely to be expensive and wasting valuable water resources. There is no mention of stormwater harvesting and supply for residential reuse in this document. Stormwater harvesting and reuse at a precinct scale is often much cheaper than installing rainwater tanks within each allotment as documented in the WSAA report: *All options on the table- urban water supply options*. It is recommended that scenarios are modified/added to promote maximising reuse of stormwater, and minimising its wastage.

Consideration of recycled water
The scenarios provided rely heavily on use of rainwater tanks. The assumptions made do not show any consideration for availability of recycled water which will offset uptake of rainwater tank solutions, most significantly in the mandated recycled water areas. Additional scenarios are recommended to suit the areas where recycled water is available.

New vs. existing imperviousness
The scope of this document is limited to addressing environmental risks associated with "new" impervious surfaces. This guidance should also aim at reducing environmental risks from redevelopment of existing developments that have excessive environmental footprint. For example, properties with paved lawns and backyards which have very high "existing" impervious areas should not be entitled to their "existing" level of imperviousness when they redevelop. Such changes have significant potential to gradually repair damages done in the past by improper developments.

Role of water companies
There is an opportunity in the document to highlight the benefits and importance of developers working with water companies to receive guidance and support in designing, building and operation and maintenance of stormwater assets, especially in the context of smart tanks and stormwater harvesting systems. Most councils and developers approach water companies for these services and this is a step in the right direction which could be further promoted through this guideline.

Introduction of flow reduction targets
South East Water supports introduction of this additional measure for reducing the stormwater pollution. However, it is unclear which targets will be applicable for which area. A reference has been made to priority areas identified in Healthy Waterways Strategy, with a target range between 50% and 90%. It is unclear how the specific target for a particular location will be determined, and by who. It is also not clear how the flow reduction targets will be determined for the Western Port Bay area where the key concern is sediment discharge to the Bay.

Operation and maintenance of assets
Lack of adequate operation and maintenance of rainwater tanks and other WSUD assets are known to result in non-achievement of the intended outcomes. Any solution proposed should duly consider the practicality, cost and responsibility for operation and maintenance of these assets. For example, guidance should be provided on who will ensure that the leaky rainwater tanks or any rainwater tanks in general in the private properties are well maintained so that they continue to function as intended?

Exploration for integrated solutions
The document needs to encourage the developers to minimise the cost of water cycle management and maximise the whole of the community benefits through integrated water management approach. As the challenges and opportunities in each development will be unique, place based solutions providing greatest community benefits will need to be identified and implemented in consultation with the council and the water corporations. We recommend this to be mentioned up-front in the document.

Consultation with the development industry
This document is intended for the development industry. It is not clear how they have been consulted in developing these guidelines and scenarios. If the consultation has not occurred, it is highly recommended that this document is issued only after proper consultation with the industry.

General Comments

Some additional clarifications are recommended for the following aspects of the document in general.

1. Timing of the Guidelines: It is unclear when this document will start to take effect and when it will cease. It has been stated that this document will be active for three years, until the new EPA Act becomes effective but it is not clear what happens after that. How will the new Act and regulations cover these requirements and guidelines? Given that it is only a guidance document issued for a short period of time, the need and effectiveness of this document is questionable.

2. Application of the Guidelines: This draft guidance has been developed to meet the flow reduction objectives which are likely to be requirements in the new BPEM. As it is not a mandatory document, it is not clear why any developer will follow these guidelines. Also, the document maintains that it is not prescriptive. However, by presenting specific solutions for particular situations, it is likely to be taken as a prescribed solution for that situation. An up-front message encouraging the developers to analyse the best solutions suitable for their development is recommended.
3. Reasonably practicable: Use of this concept limits the chances of success of the guideline. It is also unclear how "reasonably practicable" will be determined, and by whom if there are disagreements between the parties involved.
4. Cost saving: Under the "property owners" icon, the scenario schematics highlights cost reduction by way of water saving as the main attraction of rainwater tanks but does not put a $ value for the saving. Realistically, the cost saved by rainwater tanks will be very small and way below the cost of installation, operation and maintenance of the tanks. Recommend removing that item from the schematics.
5. Rainfall icon description: In the schematic diagrams, under the "Rainfall" icon, it is mentioned "treatment sizing and costs vary with rainfall in other regions". It is not clear what regions and what costs, given that they are not mentioned anywhere else in the entire document. Recommend that it is removed.
6. Storage of stormwater: Where it is intended that the stormwater is harvested and reused, it is recommended that the need for storage of harvested stormwater is clearly articulated as there will be time lag between the storm event and when the stormwater will be required. These could be included in the schematics.
7. Use of sponge: The concept of sponge is conflicting with the objective of reusing water to support circular economy. Some scenarios presented take up a significant area of land as sponge (for example scenario 5 needs 2.6% of land). The cost of such large sponge area may even offset the cost of the infrastructure required for the purple pipe network. Whole of the community costs and benefits of these solutions must be evaluated. Sponge should be promoted only for the catchments where they are specifically needed otherwise we must try to maximise reuse.
8. Roof connection to tanks: Many scenarios require that 100% of the roof is connected to rainwater tanks. This will be impractical for a large portion of developments, especially considering garage, shed and outbuildings separate from the main building. It is highly recommended that development industry is consulted on practicality of such connections.
9. Size of the rainwater tanks: There is disconnection between the size of the lot and the size of the rainwater tanks. One size does not fit all. For example, in Scenario types 7 and 8, a 2KL rainwater tank has been proposed for a multi-dwelling townhouse. 2 KL is very small for large townhouses. It should be proportioned to the total roof size of the townhouse. Was the scenario description supposed to say 2KL rainwater tank per dwelling within the townhouse?
10. Volume of stormwater harvesting: There is disconnection between the size of the development and the required volume of the stormwater harvesting. For example, in Scenario 2, the harvesting volume is suggested to be 22.5ML. This should relate to certain size of the development, and then be scaled up and down based on the size of the development. This relation is missing in the document. This applies to all stormwater harvesting scenarios.
11. Open space demand and storage: The scenarios proposing stomrwater harvesting have been limited to using the harvested stormwater for open space. Has an attempt been made to estimate the demand for the open space? Also, as there will be no irrigation demand while it is raining, the harvested water will have to be stored until there is demand. Indicative storage sizes are highly desirable in all scenarios.
12. Linkages to CRC infill typologies: The CRC has undertaken significant work in developing water sensitive infill development scenarios as part of the Integrated Research Package (IRP) 4. It is recommend that this guideline and the scenarios are linked with the relevant typologies in the CRC work as much as possible.

Specific Comments on Scenarios

We also have the following specific comments/suggestion on the specific scenarios listed below.

Scenario 3	• Class A is proposed to be supplied to "neighbouring" commercial and agricultural operations. How much is the likelihood of finding such perfect arrangement at a reasonable cost? Why is that preferred over supplying it for non-potable residential use within the precinct? South East Water will support stormwater harvesting and supply to residential properties within the development. • Wetland size is 4% in this scenario. This is a slight increase of 0.2% from scenario 2 which needs 3.8% land for wetland. In contrast, this scenario (3) treats 60% of the flow from the development compared to scenario 2 treating only 25% of the flow. This seems out of proportion as more than double the volume of stormwater is treated with almost no increase in wetland size. Over that, scenario 2 also has rainwater tanks which would further reduce treatment requirements while scenario 3 has none and hence more stormwater needs to be treated. Recommend rechecking the calculations and providing explanations to clarify this.
Scenario 6	• The rainwater harvesting volume suggested in this scenario is very low. Industrial precincts are the best areas for getting 100% roofwater harvesting but this scenario suggests only 30% roof connection. Please revise. • South East Water will support centralised storage and supply of harvested roofwater from industrial precincts. This could be supplied to neighbouring areas. This is a "must explore" scenario. • How reliable are the wetlands' performance in treating stormwater runoff from industrial precinct? Do we have examples? Some commentary is recommended.

We hope these comments and feedback will assist the EPA in further developing this guidance. For any queries or clarifications on the matters included in this submission, please feel free to contact me at Suresh.Bajracharya@sew.com.au or (03) 95523648.

Once again, thanks for providing us the opportunity to make a submission to this document.

Kind Regards,

Suresh Bajracharya

Integrated Water Management Enabler

From: Kate Matthews <KMatthews@tract.net.au>
Sent on: Wednesday, December 16, 2020 12:00:45 AM
To: Urban StormwaterBPEM <urbanstormwaterbpem@epa.vic.gov.au>
Subject: Draft urban stormwater guidance - comments

Hi Sigourney,

Thank you for the opportunity to provide comment on the EPAs draft urban stormwater guidance.

I note that my comments below are made as a town planning practitioner with a special interest in stormwater (previous Stormwater Victoria committee member) with experience interpreting and implementing the current BPEM requirements within a local government perspective, particularly in a greenfields context. Consequently these should be taken as my personal views, as opposed to these of my current organisation.

As a planning professional, my key interest in these guidelines is around implementation mechanisms and how this may impact on/integrate with the rest of the planning system, as I assume this will ultimately be implemented through the Victoria Planning Provisions. I have not reviewed or am making comment on the technical basis of the draft guidelines.

The good

- Support removal of the 1.5% ARI discharge objective, given this was inconsistently applied due to the difficulty in calculating this value, as well as lack of a standardised methodology/approach/tool.
- The introduction of objectives relating to flow volumes fills a key gap in the existing framework as it relates to flow impacts on receiving waters. The existing framework for determining appropriate flow volumes is largely based around peak flows, which is a flooding/drainage capacity issue which does not take into account the impact of additional water volumes on the ecological function of rivers, creeks and other natural water bodies (eg through changes to hydrological regimes, cold water flushes, dilution of saltwater lagoons etc). I note that this is an active issue on the Bellarine re: impact of water volumes on Ramsar wetlands (Lake Connewarre and Swan Bay)

The concerns

Whilst the draft guidelines themselves do not propose a specific compliance framework, it is expected that the main tool for their implementation will be through the Victoria Planning Provisions, given the "existing" BPEM stormwater management objectives are already embedded within a number of planning scheme provisions. The planning approvals process will therefore be the primary mechanism through which developments are reviewed, assessed and controlled against this guidelines.

Given the potential spatial impacts of the flow reduction targets – specifically those proposed for priority stormwater management areas (ie >20%) – integration with the planning system is critical to ensure that where land is required to be set aside for larger wetlands, recycled water plans, stormwater harvesting infrastructure etc, this can be integrated with wider urban form rather than "tacked on" or built out.

The key issues which need to be taken into account with future implementation are:

- How will the new requirements be implemented in areas where there are existing Melbourne Water drainage schemes and/or structure plans in place which already set expectations as to yield, development layout, land take for asset footprints, and infrastructure funding? Of particular concern are those areas subject to the higher runoff reduction target (ie >50%) in Melbourne's north west, which have already been subject to detailed strategic planning processes with development underway. These include:
  - Toolern PSP (Melton)
  - Rockbank PSP (Melton)
  - Melton North (Melton)
  - Rockbank North PSP (Melton)
  - Sunbury South PSP (Hume)
  - Lockerbie PSP (Hume/Whittlesea)
  - Wollert PSP (Whittlesea)
  - Shenstone Park PSP (Whittlesea – proposed)
- Consideration needs to be made as to whether any new requirements within the planning system to implement the new guidelines will be transitional or not (ie will there be provision for older approvals to only meet the previous guidelines). This is particularly important for areas with existing Precinct Structure Plans (PSPs), structure plans, infrastructure plans etc as depending on the flow reduction target considerable rework could be required not only of the approved spatial layout for future development of these areas, but also development costing and infrastructure funding arrangements where catchment/sub-catchment scale (ie not site specific) infrastructure is required and no one developer can be burdened with the cost. It is strongly recommended that areas where this could be an issue be identified well in advance of any planning scheme changes and consultation undertaken with Council/VPA and Melbourne Water (potentially through DELWP State Planning Services) to determine the potential impacts and changes required, so as to avoid this being done "on the run" through individual development approvals. It should also be noted that in areas where a Development Contributions Plan (DCP) or Infrastructure Contributions Plan (ICP) applies, which is pretty much anywhere with a PSP in place, these will need to be amended if stormwater assets are to be larger as a result of the flow reduction targets as this will reduce overall developable land area, and therefore potentially increase per hectare contribution rates. This is not a straightforward process and will have to go through public consultation. State Planning Services can provide further advice on the statutory requirements of said process.
- The example development plans have a heavy focus on how the flow reduction targets can be met in a greenfields residential context. However, excluding single dwellings and additions, the majority of development approvals within Melbourne are for infill residential (townhouses/apartment buildings). Based on the example plans it appears that there will be no real material difference in the treatments required to meet the 25% flow reduction than are already required under the current planning scheme controls. However, it is not clear what the implications will be from the higher flow reduction target on this development type. It is noted that unlike subdivisions, these type of developments typically do not have an engineer as part of the project team and are likely to rely on Council to tell them how to meet requirements, particularly in areas with lower land values and/or smaller scale developments (2-3 townhouses). This end of the market also has less design options to meet requirements, with "deemed to comply" solutions likely to be the most practical mechanism to achieve meaningful compliance. What work has been done in this space?
- Following on from the above, applications for many smaller developments are often managed directly by the project architect/planner, who rely heavily on simple tools such as STORM to calculate compliance with the current stormwater requirements. Implementation of the new guidelines must take this user base into account, as the majority will not be familiar with engineering calculations or software.

Questions

- The current stormwater guidance only identifies those areas subject to the higher flow reduction target (priority areas for enhanced stormwater management) within Melbourne Water's waterway management district, based on the analysis undertaken in Melbourne Water's Healthy Waterways Strategy. However, there are many regional cities such as Geelong, Bendigo and Ballarat which are also subject to growth pressures. The guideline mentions that "a transparent process is required to identify priority areas for enhanced stormwater management outside the greater Melbourne area." What is the state of knowledge for waterways in regional Victoria at most risk from urban development, and what institutional/funding arrangements are required to ensure that this work can be done within a reasonable timeframe of the guidelines taking effect and/or their implementation through the planning system?
- Are there existing tools available for calculation of average annual runoff volumes, and if so what is their audience? Noting our point above, if implemented through the planning system assessment of compliance with these guidelines will largely be undertaken by people outside of the stormwater industry. Are there plans to update/create new tools to service this audience, and if so are they going to be ready before the guidelines take effect?

Happy to discuss further if required.

Kind regards,

Hi,

I would like to make a quick submission on behalf of the team behind the development of the InSite Water tool (www.insitewater.com.au).

InSite Water is designed and maintained by the team at Organica Engineering. We are an independent engineering consultancy specialising in partnering with other organisations on Integrated Water Management and other sustainability opportunities. We are based in Melbourne, Australia. InSite Water site has been developed with the support of Manningham Council, Knox Council, the City of Greater Dandenong, Water Sensitive SA and Melbourne Water.

InSite Water is an Integrated Water Management tool designed for use on single lots in Australia that need quick and accurate stormwater engineering answers.
This site will allow you to optimise:
– detention tank sizing
– stormwater treatments such as raingardens
– water savings through efficiency
– water tank size optimisation
– volume management using water retention and infiltration sizing

I would like to say we are very supportive of the new EPA Urban Stormwater Management Guidance. We are very supportive of specific measurable targets being included in the tool. Without these clear targets it is hard for engineers and designers to know if their designs meet criteria. It is great to see the clear, science based approach outlined in the draft guidance.

We note that InSite water gets a mention as an appropriate software tool for measuring all indicators in the performance objectives. We would like to make it clear that we are happy to work with the EPA and other stakeholders to ensure that InSite remains an accurate, affordable, and useful way for planning and development projects to demonstrate compliance with the EPA stormwater targets. We note and we are willing to adapt and tweak the software if necessary to ensure the highest level of engineering rigour in the designs that the InSite software facilitates.

Our mission is to improve stormwater quality in urban areas, and to help built environment projects to deliver practical and function Integrated Water Management outcomes.

Please feel free to contact us if you have any questions.

regards,

Ian Adams BEng(Env) MIEAust M.AIRAH GSAP
InSite Water
Director – Organica Engineering P/L
Sustainability and Environmental Engineer

SLURRYTUB™

Sigourney Irvine
Senior Policy Officer
Policy & Regulation Unit
Environment Protection Authority Victoria

14 December 2020

Dear Sigourney,

Draft Urban Stormwater Management Guidance
- Introducing SLURRYTUB

Thank you for the opportunity to provide feedback on the EPA's draft guidance for urban stormwater management. We are an Australian business that has developed a brand new, cost effective and patented solution that will significantly reduce damaging urban stormwater runoff from new development building sites.

Our founder, Angus Hudson has been a builder for over 30 years and invented SLURRYTUB after witnessing a recurring problem on many building sites, where setting up a 'washout area' for tradesmen under the current somewhat outdated guidelines was impractical. Most were just taking shortcuts and washing the slurry down stormwater drains or ruining lawns and gardens.

SLURRYTUB is essentially a filtering system that provides a practical and cost-effective solution for the disposal of 'wet trade' slurries from building sites, making the protection of the environment and our stormwater infrastructure much simpler.

Significantly, in May of this year, we were awarded an Environmental Performance - Innovation Grant from the Council of the City of Sydney (COS) which funded an extensive trial of our product within the COS jurisdiction. The trial was extremely successful with 100% of the more than 30 builders and contractors saying that SLURRYTUB made their clean up on site and their subsequent compliance, much easier.

The Problem

Typically, at the end of every day on building sites, bricklayers and most other wet trade contractors wash out their cement mixers and tools into their wheelbarrow. The wheelbarrow is then washed out, scrubbed and the resulting 20 - 40L of slurry is usually deposited nearby, the barrow then hosed out ready for the next day.

This slurry *often* flows into groundwater or onto the street and subsequently down a stormwater drain. It all too often leaves an unsightly mess in gardens or lawns or on our pavements, roads and gutters. And significantly for the industry, inappropriate disposal can result in large financial penalties for the site manager, usually the builder.

Recommended Industry Guidelines

As you would be aware, across Australia there are a number of 'best practice' guidelines which are usually published and overseen by councils to assist the building industry protect the environment by providing guidance on approved site cleanup methods. One such guideline document from NSW, provides a fact sheet on designated 'Protected Washout Areas' which uses the following diagram to illustrate an approved method, using haybales as a filtering system.

Our experience with these guidelines, over many years in the construction industry is that they are impractical and often not observed, particularly on smaller sites. We have witnessed many 'improvised' washout areas and have seen many sites where the guidelines have simply been ignored. SLURRYTUB's objective is to make this process so much easier to comply with.

While the consultation Draft Guideline document does reference 'implementing controls to minimise risks' (see 2.2 page 8), we think it could go further by introducing new methods that clearly support the EPA's focus on designing 'systems' to better manage urban stormwater runoff from building development sites. Of course, we recognise that the EPA cannot endorse brands or products, but we believe our approach to filtering should be considered as a more efficient system.

In summary, SLURRYTUB is simply a more convenient way to support building site compliance amongst tradespeople and we would be prepared to be involved in any process to help improve 'best practice' in relation to their management of stormwater/wastewater runoff from development sites.

How does SLURRYTUB work

SLURRYTUB is a heavy-duty recyclable plastic tub, lined with a biodegradable cellulose paper filter that **captures and filters the cement slurry** (which has an extremely high level of total suspended solids), leaving visibly clear water to drain within the designated washout areas or be recycled on the job. When dry enough, simply dispose of the hardened waste, along with the biodegradable filter into the work site skip or other approved disposal method. The instructions for SLURRYTUB are shown below:

		
Step 1 • Place disposable filter into the tub with the flap with the logo at the front over the cutout area. • Secure by placing the reinforced holes in the filter over the cleats in each corner of the tub.	**Step 2** • Stand the wheelbarrow up to empty the slurry into the tub, resting the barrow's lip in the tub cutout, which supports most barrows handsfree. • Take care to avoid tearing the filter. • **Allow filtered water to drain safely in washout areas or recycle** on the job. • Taps and hoses can be connected to the 2 threaded outlets for directing the cleared water.	**Step 3** • Most of the water should drain within 30-60 minutes depending on the slurry contents. • Dispose of the filter and dried contents into a suitable site skip or other appropriate waste disposal method. • **Use only one filter per washout.**

The filtered water which flows from SLURRYTUB is visibly clear and we have completed numerous laboratory tests (NATA approved) of slurries before and after the SLURRYTUB filtering process, with all samples showing the following key results for the cleared water:

- Total Suspended Solids (TSS) of less than 50mg/l over time (i.e. the filtered water appears clear to the naked eye).
- Levels better than the Australian Drinking Water Guidelines, other than pH, for all heavy metals other than Chromium.

We make it very clear that users of SLURRYTUB should still dispose of the filtered water in the protected washout area or recycle it on the job.

GECA Certification

Following a rigorous examination process over several months, we were recently certified by GECA (Good Environmental Choice Australia). The GECA ecolabel is an independent 'tick' that shows our product is better for the environment, has a lower impact on human health and has been ethically made.

GECA's goal is to empower architects, builders, designers and consumers to have confidence in their purchasing decisions and to trust GECA certified products to be healthier, safer and better for the environment. GECA's rigorous certification standards follow ISO 14024 principles and ISEAL frameworks for global best practice in ecolabelling, which are then independently assessed by their Assurance Providers.

SLURRYTUB Launch in Australia

The global launch of SLURRYTUB will commence in Australia from March 2021, with a less than $100 RRP for a Starter Kit of a tub and a 6 pack of filters. Replacement filters will be separately available in packs of 6 or 24, largely online via our website.

Our goals are to engage with all environmental policy, regulatory and industry groups to become part of any regulated washout guidelines; to inform and educate the building industry to encourage the widespread use of the SLURRYTUB method; and to ultimately help our environment with a cleaner, simpler solution that will reduce the pollution of stormwater systems throughout the world.

We look forward to your support and working with the EPA, the stormwater industry generally and all local Councils to ensure this innovative, cost effective, **Australian Owned and Made** solution is adopted within recommended guidelines across the building industry, specifically amongst builders, site managers and 'wet trades' using products like cement and concrete.

If you would like some more information or we can assist in any way, please contact me on the details below, or visit our website www.slurrytub.com and Instagram #slurrytub.

Yours sincerely,

David Flintoff
Chief Executive Officer

M: 0421 618 080
E: david@slurrytub.com
www.slurrytub.com
Instagram: #slurrytub

16 December 2020

Environment Protection Authority Victoria
Email: urbanstormwaterbpem@epa.vic.gov.au

Dear Urban Stormwater team,

Re: Draft urban stormwater management guidance

We write with regard to the Draft urban stormwater management guidance (publication 1739). The Council Alliance for Sustainable Built Environment (CASBE) welcomes the opportunity to provide the following feedback on EPA's Draft Urban Stormwater Management Guidance. We also welcome the scientific and technical insights that will enable stormwater management practices to better meet the quality and flow objectives across the development, land-use and infrastructure sectors.

BACKGROUND

CASBE

CASBE is a collaborative alliance of Victorian councils committed to the creation of a sustainable built environment within and beyond their municipalities. CASBE provides a forum for the exchange of information and ideas on innovation and best practice in ESD. Our local, ground-up approach has resulted in collaborative local government led action and broad scale positive change to Victoria's built environment and a significant reduction to its consequent environmental impacts, including stormwater impacts.

CASBE member councils include:
Banyule City Council, Bass Coast Shire Council, Bayside City Council, Brimbank City Council, Darebin City Council, Frankston City Council, Glen Eira City Council, Greater Bendigo City Council, Greater Dandenong City Council, Greater Geelong City Council, Hobsons Bay City Council, Hume City Council, Kingston City Council, Knox City Council, Manningham City Council, Maribyrnong City Council, Maroondah City Council, Melbourne City Council, Melton City Council, Monash City Council, Moonee Valley City Council, Moreland City Council, Port Phillip City Council, Stonnington City Council, Whitehorse City Council, Whittlesea City Council, Wodonga City Council, Wyndham City Council, Yarra City Council, Shire of Yarra Ranges.

Our focus is on applying widely accepted Environmentally Sustainable Development (ESD) principles to the built environment through the Victorian planning system. To enable this, CASBE member councils have developed the *Sustainable Design Assessment in the Planning Process* (SDAPP) framework - a streamlined and consistent methodology for requesting, receiving and assessing built environment sustainability outcomes through the planning process. By implementing the SDAPP framework and using its tools, councils can achieve more sustainable outcomes from their local built environment for the long-term benefit of their community.

To complement this work and address current sustainability gaps in greenfield subdivisions, CASBE in partnership with sixteen Victorian councils and the Victorian Planning Authority recently launched the *Sustainable Subdivisions Framework (SSF)*. CASBE is currently supporting 29 councils in a trial of the SSF over an eighteen-month period.

Sustainable Design Assessment in the Planning Process (SDAPP)

There are several processes that support and underpin the SDAPP framework:

- The consistent local Environmentally Sustainable Design (ESD) Policies held by 19 Victorian Councils.
- The Best Practice Standards listed in the local government Sustainable Design Fact Sheets, and
- The Built Environment Sustainability Scorecard (BESS).

Local ESD Policies

A key aspect of CASBE's work has been to facilitate the introduction of local planning policy that requires ESD design strategies to be considered by the community when undertaking development projects.

The development of the local ESD Policy involved many years of local government leadership in research and development of pilot programs, purpose-built planning tools and procedures to demonstrate the value of including sustainability in the consideration of planning permit applications. This work was fundamental to provide the justification for a collective of six councils (Moreland, Banyule, Port Phillip, Stonnington, Whitehorse and Yarra City Council) to seek to formally introduce a local ESD Policy, consistent across the councils, into their respective Planning Schemes. This process included the Ministerial appointment of the Environmentally Efficient Design Advisory Committee to independently evaluate the merits of the new policy.

This robust evaluation of the initial ESD Policy and its subsequent success in delivering sustainability design in new developments within the initial 6 councils' municipalities enabled other councils to follow suit. There are now 19 councils with this local ESD policy and more utilising the methodology and purpose-built tools aimed at delivering ESD outcomes through the planning system. A full list of these policies is provided on the CASBE website.

Stormwater objectives in the local ESD policies include:

- To reduce the impact of stormwater run-off.
- To improve the water quality of stormwater run-off.
- To achieve best practice stormwater quality outcomes.
- To incorporate the use of water sensitive urban design, including stormwater reuse.

These policies reference the Urban Stormwater Best Practice Guidelines, CSIRO, 2006 and the BESS and STORM tools.

Best Practice Standards

The Local ESD Policies are supported by the Best Practice Standards that are articulated in the suite of Sustainable Design Fact Sheets developed by CASBE councils.

These Fact Sheets form a consistent set of standards that councils use to define their sustainability expectations. These fact sheets are available for any council to adopt; however, the standards remain the same for each council.

Each fact sheet lists *Mandatory Requirements* and *Council's Best Practice Standards.* The *Mandatory Requirements* list minimum sustainability standards as outlined by the Building Code of Australia and relevant Planning Scheme clauses. The *Best Practice Standards* list councils' expectations for each of the ten Sustainable Building Categories, including stormwater.

Related to stormwater, the standards reference the Urban Stormwater Best Practice Environmental Management Guidelines (BPEM), local integrated water management plans as well as the STORM and MUSIC tools.

BESS

The *Built Environment Sustainability Scorecard* (BESS) is an online tool for assessing the sustainability of development proposals at planning stage. BESS provides a consistent assessment methodology for the Best Practice standards within the SDAPP framework. BESS has the same Sustainable Building Categories as the Fact Sheets, apart from the Materials Category. BESS provides a dynamic interface for developers and building owners to prepare a sustainability assessment of their project for the purposes of meeting councils' sustainability requirements.

SDAPP and BESS both consider whole of building environmental issues, however they also encourage development applicants to consider site and surrounding natural environments that preserve and enhance natural waterways. Stormwater is one of ten environmental categories within the BESS tool and SDAPP Framework. Principles covered in these categories include:

- The critical role that environmental infrastructure plays in securing and protecting biodiversity, wildlife habitat and waterways;
- The importance these spaces have for human amenity and liveability, including vital connections to nature;
- The role that environmental infrastructure has in ameliorating climate change impacts, including creating safe spaces for people and also habitats for wildlife during heat wave events, and how these spaces help mitigate the urban heat island effect.

The BESS tool specifically considers stormwater treatment in development. The Stormwater category in BESS includes actions regarding stormwater treatment. Development applicants must meet the Urban Stormwater Management Best Practice Guidelines (BPEM) standards for water quality (CSIRO, 1999), e.g., through a min 100% STORM score, or a compliant MUSIC model.

Currently, the BESS tool assesses compliance with the BPEM standards through the completion of a STORM or MUSIC report.

BESS also includes a Water category focussed on potable water reduction. Amongst other approaches, this category encourages stormwater related improvements through rainwater harvesting and use onsite as well as water efficient landscaping.

Other stormwater considerations that are not captured in BESS but are also encouraged as appropriate include:

- For industrial developments - containing polluting activities within the canopy line or within a bunded area
- Installing gross pollutant traps where hardstand paving drains to SW system
- Installing pervious paving where appropriate

Sustainable Subdivisions Framework.

The Sustainable Subdivisions Framework (SSF) provides a framework to assess sustainability measures in subdivision applications, which is currently being tested by 29 Victorian councils through an 18-month trial. The SSF was developed as a state-wide replicable model through a collaboration of regional and growth area councils with a focus on greenfield subdivisions, however it can equally be applied to infill subdivision and precinct sites.

The SSF includes a number of categories which relate to water management infrastructure including:

- Streets and Public Realm – which recognises the critical role of developing a people focused local street network and public realm (including open space, including playgrounds, parks and sporting fields) to encourage walking and recreation whilst increasing biodiversity, encouraging stormwater re-use and mitigating the urban heat island effect.
- Ecology – which highlights how subdivisions can retain and enhance ecology to provide key ecosystem services including waterway conservation, runoff mitigation, habitat for wildlife, urban temperature regulation, food supply and recreational and aesthetic benefits.
- Integrated Water Management – which demonstrates how all aspects of the water cycle, including reduced water consumption, beneficial use of recycled and stormwater and water sensitive design can be integrated and collaboratively managed in subdivisions, which is critical to ensuring the future water security of our communities.
- Urban Heat – which recognises the need for urban heat mitigation strategies in subdivisions to cool the landscape and enable future residents to move safely and comfortably through the community without compromising their health and wellbeing.

Specifically, the objectives of the Integrated Water Management category of the Framework are:

1. To reduce water consumption through environmentally sustainable subdivision and building design
2. To provide lots with areas and dimensions that enable the appropriate siting and construction of a dwelling that can be serviced with water, wastewater and other essential services
3. To maximise use of alternative water sources for public and private use (through strategies such as public and private rainwater tanks, stormwater reuse and localised recycled water systems)
4. To incorporate water sensitive urban design techniques into development including enhancing riparian vegetation (waterway health), drainage reserves adjacent to wetlands and protection of biodiversity and landscape features for improved amenity
5. To provide a wastewater system that is adequate for the maintenance of public health and the management of effluent in an environmentally friendly manner
6. To ensure the location and scale of open space responds to existing drainage channels

7. To meet the Best Practice Environmental Management Guidelines for Urban Stormwater
8. To control localised flooding and plan for increasingly intense rainfall events, as projected by climate change models
9. To use water as a tool for reducing urban heat
10. To support regional integrated water management solutions such as identified through the IWM forums

DRAFT URBAN STORMWATER GUIDANCE PUBLICATION 1739

CASBE welcomes the publication of the proposed new stormwater performance objectives, and we support the provision of an Urban Stormwater Management Guidance document.

We provide the following specific comments on the guideline's publication:

Quantitative Performance Objectives

CASBE councils are supportive of the inclusion of locally appropriate stormwater flow performance objectives in addition to the existing stormwater quality objectives.

We bring the *Sustainable Design Assessment in the Planning Process Framework* and the *Sustainable Subdivisions Framework* (refer Background section) to your attention as these programs are actively supporting the implementation of stormwater quality outcomes through the planning system in Victoria. Some councils also consider flow in combination with quality through both planning and the Legal Point of Discharge mechanism.

Inclusion in the Victorian Planning Provisions

While we understand that it is not intended for this document to be a compliance document, we note that under the proposed Environment Reference Standards that will come into effect on 1 July 2021, the general environmental duty of care will a) require councils not pollute, and b) require councils to have an understanding of the 'state of knowledge'. The question then is, as a statutory planning authority, what do councils do with this document which forms part of this state of knowledge, and yet is very vague in terms of its regulatory authority.

Guidance is required for Council, particularly when exercising decisions to grant planning permits, as to how Council should navigate the following legislative requirements/risks/duties, mainly with respect to flow and flood risks posed to existing development and infrastructure:

- Environmental sustainability and climate change risk obligations under the *Local Government Act 2020* (Vic) sections 9(2)(b), (c); and
- The general environmental duty under the *Environment Protection Amendment Act 2018* (Vic) part 3.2.

Section 2.1 (page 7) of the guidance document details that 'reduction levels for solids, phosphorus and nitrogen' are 'required to be achieved' under the Victoria Planning Provisions (VPP) however there are limitations with respect to language effectively utilised within such State provisions. Within a Council's Planning Scheme, the Planning Policy Framework (PPF) and Victoria Particular Provisions (VPP) do not utilise binding language when referring to the *Urban Stormwater - Best Practice Environmental Management Guidelines (Victorian Stormwater Committee, 1999)*. Rather, the language utilised states 'consider as relevant' (see, eg, PPF clauses 14.02-1S and 19.03-3S), or that a 'stormwater management system should be designed to meet' the guidelines (see, eg, VPP clauses 53.18, 55.03-4, 55.07-5 and 58.03-8). As such, it is not a strong 'requirement', per se, that the stormwater quality reduction levels and stormwater flow are strictly adhered to.

CASBE recommends that Urban Stormwater Guidance Publication does become part of the regulatory framework, and that part of that framework is the Victorian Planning Provisions (VPP)s. Incorporating the Urban Stormwater Guidance Publication, and specifically, new locally appropriate flow performance objectives, as a statutory requirement in the Victorian Planning Provisions (VPP)s, as soon as possible, will enable councils to better meet their environmental duty of care responsibilities.

Furthermore, including this document within the VPPs will support the existing work that councils are already undertaking with respect to stormwater performance (refer SDAPP and SSF above).

Finally, there are significant developments being planned over the next few years as a result of Federal and State Government COVID-19 recovery stimulus projects. Expedient inclusion of the new BPEM performance objectives in the Victorian Planning Provisions will capture this body of new work.

Interim period

When requesting that applicants appropriately address IWM and when writing planning permit conditions, councils rely upon clauses 34 and 44 of the *State Environment Protection Policy (SEPP) (Waters)*. To that end, it is vital that the *SEPP (Waters)* clauses remain intact and are appropriately transitioned or translated to the Orders for Managers of Land or Infrastructure (OMLIs) or other suitable instrument.

Wording – Reasonably Practical

CASBE recommends that the EPA further defines the term 'Reasonably Practical' as it relates to stormwater management. As outlined in the Background section, the ESD Policy councils use the term Best Practice to define councils' minimum sustainability expectations. Guidance is required as to how the term and application of 'reasonably practicable' differs and compliments the term and definition of 'Best Practice' that is the overarching objective provided within councils' statutory ESD Policies within their planning schemes and that must be addressed when deciding a planning permit application. The interpretation and application of both terms, 'reasonably practicable' (as per section 1.1 of the document) and 'best practice' in the ESD Policies appear synonymous.

We are concerned that without clear achievable performance standards linked to the term 'Reasonably Practical', the development industry will not have clarity on the stormwater expectations of councils.

With respect to section 2.1 of the document, the test of 'reasonably practicable' should apply to both stormwater quality and flow criteria, not just stormwater flow. This is also supported by the point raised above given language utilised within a council's planning scheme.

CASBE supports the inclusion that "*Performance against the objectives in Table 1 can be used as a signal of the level of risk of waterway values being lost or impacted. EPA regards development that does not meet those performance objectives as presenting a high risk of harm.*" CASBE recommends that the "high risk of harm" measure be more clearly indicated as an unacceptable outcome. Clearer indication of what risk rating following control measures being put in place is considered an acceptable level would also assist clarity for the intended audience.

The Background information document related to publication 1739 includes that "new proposed objectives for urban stormwater flow reduction are not compliance requirements, and the level of stormwater flow reduction to achieve will depend on what is reasonably practicable." This is acknowledged. However, CASBE is consistently requested to help improve consistency and certainty for the development industry.

Clarity of the relationship between the stormwater flow reduction presenting a high risk of harm yet not being compliance measures would help consistency and certainty.

<u>Assessment tools.</u>

We note the content within the guidance document on 'appropriate' software tools to assess stormwater performance objectives. We make no comment for or against the use of, or any specific, assessment tools, however we strongly recommend that the EPA provide guidance regarding the protocols of what constitutes an 'appropriate' tool for demonstrating compliance with the new BPEM requirements.

CASBE has a diverse mix of member councils who have different approaches to what they accept as appropriate stormwater assessment tools for development. We understand that the current tools available in the market do not at this stage provide a complete approach to assessing the performance objectives outlined in the document.

CASBE recommends that EPA develop a protocol that stormwater assessment tools need to meet or deliver in order to be considered 'appropriate' for assessing the stormwater performance objectives.

CASBE would be very happy to draw on the experience of our member councils to provide specific feedback to the EPA on what might be included within such a protocol. Establishing a clear benchmark in this way for assessment tools enables other players to potentially enter the market and provides guidance to councils in terms of which tools can be accepted by councils to demonstrate achievement or even compliance with the performance objectives.

Scenarios

The provision of scenarios in the document for developers to consider in the design of new development are supported. They help to demonstrate that meeting the metrics included in the document are realistic and achievable for the range of development types included.

While the existing scenarios in the document are an excellent inclusion, they are a small subset of the diverse range of development types that CASBE member councils assess. Additional scenarios related to infill development of townhouses, medium and high density would also prove helpful.

Geography, geology and local context lead to a diversity of accepted approaches across local government areas. This should be acknowledged in the document.

Please contact me if you wish to discuss this matter further on 03 9667 5561 or casbe@mav.asn.au.
Yours sincerely

Natasha Palich

Natasha Palich
CASBE Executive Officer

Notes:

"CASBE Submission re Draft EPA Urban Stormwater Management Guidance" has been prepared by the CASBE staff at the MAV for discussion with CASBE member councils, and the State Government on urban stormwater management.
CASBE is auspiced by the Municipal Association of Victorian (MAV). This submission is made on behalf of CASBE member councils and the views represented in this submission do not necessarily represent the views of the MAV. While this paper aims to broadly reflect the views of CASBE member councils, CASBE has a diverse mix of member councils and the views represented in this submission do not necessarily represent the views of all CASBE members individually.
Individual councils may also respond to issues specific to, and on behalf of, their communities. The CASBE staff thanks and acknowledges the contribution of those who have provided their comments and advice in the development of this submission.

environment & land management pty. ltd. ABN 84 067 479 261
28 royle court, woodend VIC 3442 **t** 03 5427 1770 **f** 03 5427 1740 **e** kay.elm@bigpond.com

16 December 2020

EPA Victoria
200 Victoria Street
Carlton VIC 3053
By email: urbanstormwaterbpem@epa.vic.gov.au

Dear Sir/Madam,

Draft Urban Stormwater Management Guidance, Publication 1739, Oct 2020

I am writing to you as a planning practitioner who has been involved with urban stormwater management and planning for water sensitive urban design for over 20 years. During this time, I have prepared stormwater and integrated water management strategy plans, which have been devised to deliver environmental improvements in our receiving waters and, more latterly, to improve the ecology and amenity of our urban areas. My personal focus has been on integrating best practice environmental outcomes in the Victorian planning system, and I have authored or co-authored several reports to support this achievement.

We have now arrived at a point where the Victorian planning system, through the Victoria Planning Provisions (VPP), recognises the importance of the environmental management of stormwater runoff and the potential to use onsite rainfall as an alternative to the reticulated water supply. The VPP requires new developments to comply with the Best Practice Environmental Management objectives for urban stormwater (BPEM) and consider incorporating other benefits such as using stormwater instead of reticulated water for some purposes, groundwater infiltration and landscape amenity. Virtually all forms of urban development are now covered by multiple planning provisions requiring these outcomes except for dwellings on single lots, however, a majority of these dwellings are being built in housing estates that comply with BPEM and deliver other benefits at the precinct level.

The EPA proposes to issue Urban Stormwater Management Guidance, which would introduce new baseflow and other flow reduction performance objectives. This includes the following changes:

Baseflow contribution	10% of mean annual rainfall volume to contribute to baseflow (Note: 2, 4, 5)
Flow reduction	50 – 90% reduction in mean annual total runoff volume in priority areas for enhanced stormwater management (Note: 2, 3, 7)
Flow reduction	25% reduction in mean annual total runoff volume in areas that have not been identified as priority areas for enhanced stormwater management (Note: 2, 3)

Extract from Table 1 of the draft guidance.

I provide the following comments on the proposed guidance from the perspective of a planning practitioner:

1. The changes proposed in the guidance with respect to flow need to be incorporated in BPEM. BPEM is given statutory weight in the VPP as it is a mandated requirement subject to the relevant VPP provision. It contains clear and enforceable minimum performance standards. Labelling a performance objective as guidance will create confusion in the planning system as to whether the guidance for baseflow/flow reduction applies and the weight the performance objectives (one or all?) ought to be given in decision making.

2. The concept of "reasonably practical" is not one that I am familiar with in the planning system, and it is guaranteed to lead to endless debate and negotiations between individual planning applicants, their consultants and council staff. To successfully implement urban stormwater performance objectives in the planning system, the objective must be clearly defined (i.e. as it is for the current BPEM). It must be measurable using industry accepted tools so that planning applicants can design and councils/VCAT can assess a planning application against it. The EPA, industry, councils and developers who will make the infrastructure investment should have confidence about the consistency of "the rules" and the environmental improvements that will be delivered.

3. To achieve number 2, above, the published guidance on baseflow and other flow reduction performance objectives must be adopted as minimum standards. A decision about which of the two flow reduction performance objectives to use will need to be made for mean annual total runoff volume, as well as identification of where a performance objective higher than 50% and up to 90% is warranted. For the higher-risk catchments, an agreed framework is needed to establish the basis for a higher performance objective. This should take a strategic, cumulative approach and could consider "reasonably practical". Mapped boundaries (not just catchment references) should be used to define the spatial area of a high-risk catchment performance objective. The EPA and DELWP planning will need to agree on how more stringent catchment requirements are to be incorporated in a local planning scheme. A streamlined process to identify and incorporate high-risk catchment performance objectives is encouraged.

Thank you providing the opportunity to comment on the draft guidance on urban stormwater management. I am keen to see how the EPA proceeds and would welcome the opportunity for further discussion.

Yours sincerely,

Esther Kay
Director
Environment & Land Management Pty Ltd

E2Designlab submission on the Draft urban stormwater management guidance

E2Designlab welcomes the opportunity to make a submission to the EPA on the Draft Stormwater Management Guidance. It is excellent to see the objectives for stormwater being updated after 20 years since the original Best Practice Environmental Management Guidelines for Stormwater were established and following more than seven years of review to confirm the proposed revisions.

It has long been recognised that changes in hydrology adversely impact on urban waterways and the introduction of volume reduction objectives is an important step in starting to address these.

We consider that the following key points are essential:

1. The objectives are statutory obligations embedded within the planning system
2. Clear and unambiguous flow reduction performance objectives exist for any given site
3. Flexibility for the future is preserved for a range of responses and tools

The objectives are statutory obligations embedded within the planning system

It is unclear what status of the 'Draft urban stormwater management guidance' will have in the planning system. To be effective, they must be clear statutory requirements. Objectives that are aspirational, optional, uncertain, ambiguous or in any way difficult to assess by planners are at risk of simply being ignored by most planning authorities or inconsistently and ineffectually applied at best. Without statutory underpinning Council planners are likely to avoid the risk of being challenged in VCAT and therefore any push back from the development industry will weaken any attempt to implement these important flow reduction standards/ojectives.

Amendment VC154 and the decision guidelines 'whether the owner has entered into an agreement to contribute to off-site stormwater management in lieu of providing an on-site stormwater management system' is one example of how flexibility can be offered in constrained site conditions. This enables the use of onsite BPEM compliance on individual sites as far as practical and then allows for a limited portion of BPEM compliance to be met through an offset if the site is too constrained/difficult. In most instances evidence on achieving compliance demonstrates a 25% reduction in Mean Annual Runoff Volume (MARV) is reasonably easy to achieve using several on-site WSUD assets including, for example, a rainwater tanks connected to indoor demands.
EPA need to clearly and confidently set out the rules of the game. The market and industry may grumble but they will follow these, innovate and find solutions for the objectives set. History shows that there was little push back with the introduction of pollutant load reduction standards via Clause 56:07 for residential subdivisions in 2006 and more recently to several other develop types with Amendment VC154 in 2018. This is because the requirements were clear and the statutory hook provided.

Recommendation: To give the objectives in the 'Draft urban stormwater management guidance' clear standing within the Victorian planning system with the same statutory weight as the Best Practice Environmental Management Guideline objectives have now.

Clear and unambiguous flow reduction performance objectives exist for any given site

The proposed flow objectives provide options for 25% or a range of 50-90%. It is unclear what the basis is for determining which of these should be applied.

Developers, consultants and planners attempting to use these guidelines will be much happier and effective if there are clear requirements without ambiguity or uncertainty where possible.

Please tell us that these are the objectives for new development, these are the levels that must be met and under what circumstances there may be variations or scope for discretion (preferably limited).

While recognising the importance of the new risk-based framework and placement of the duty of care upon the proponent, leaving the level of stormwater flow reduction to what is 'reasonably practicable' simply creates a race to the bottom. The purpose of these objectives is to protect waterways. If a developer does not fully comply with the relevant objective for their site then surely this presents a 'high risk of harm' and they are then likely failing to fulfil their obligations. If so, then corresponding clear expectations should be set.

It is recommended that the level of reduction to be achieved (i.e. where it sits within the 50-90% band) is clearly and explicitly based on assessment of the relevant receiving waters *by the authorities* and is set on a catchment or sub-catchment basis as a firm number so there is clarity and equity for all. It should be noted that the Healthy Waterways Strategy sub-catchment targets are worded as a ML/year target per area of new impervious surface (not a % reduction). While the targets are broadly in the 50-90% range, it may cause confusion as they are expressed in different ways.

This should be clearly referenced to policy or objective established by the responsible catchment manager, for example in the case of Melbourne Water the Healthy Waterways Strategy (HWS). It is already available so please spell it out and make the connection explicit (more than a footnote). It may also be worthwhile allowing for future flexibility, as the Healthy Waterways Strategy may be superseded or new areas of priority may be identified by the Catchment Management Authority. Other planning controls could be used in parts of the state or metropolitan areas by councils if they fall outside of the priority catchment areas specified in HWS. For example, the Shire of Yarra Ranges have introduced an Environmental Significance Overlay - Schedule 2 (ESO2) that seeks to improve the quality and quantity of stormwater entering the Little Stringybark Creek, and in so doing, provide multiple beneficial outcomes for the local communities and waterways.

The CMA's around Victoria could undertake catchment assessments and establish what the flow objectives are for various waterways within their area of responsibility. We recognise this process may take time and initial default assumptions may be needed to allow flow objectives to be defined, and adopting a precautionary principle approach for known high value waterways would push the CMA's to do their assessments.

Recommendation: Clearly specify the rules for determining what flow objective is applicable where, how different areas are differentiated, what the process is for setting objectives in catchments where it is not yet determined and what the 'default' is until this occurs.

Flexibility for the future is preserved for a range of responses and tools

Flexibility may be preserved by allowing a range of potential responses, as well as tools for demonstrating compliance, subject to approval of these by the relevant authorities.

The paragraph on tools under 'Metrics to assist you to evaluate risk of harm' must be completely rewritten.

It is recommended that only recognised regulatory tools are included, i.e. MUSIC and STORM. To only identify a tool such as 'insite' implies adoption of this tool only (without independent peer review by recognised industry experts).

It would be best to make a general statement that other potential tools exist. While government support to develop tools for compliance assessment for a new legislated requirement would seem prudent, the market may rise to meet the need in the continuing absence of such support.

Recommendation: It is strongly recommended the statement about InSite and all references to it are deleted.

Recommended revised wording:

To assess these performance objectives, use an appropriate software tool. The MUSIC (Model for Urban Stormwater Improvement Conceptualisation) stormwater model by eWater may be used to demonstrate compliance with all objectives. STORM and Insite also have the capability to support multiple objectives which it simplifies to a single result –to reduce complexity for the user. The existing web implementation of the STORM Tool currently does not cover flow volume as an objective although it can readily be adapted to do this.' Other tools may also be made available by government or industry in future although these do not yet have regulatory support.

Minor grammar and suggestions

Objective: mean total annual runoff volume

Could this be simplified to mean annual runoff volume (MARV)? This means the mean or average runoff occurring within a year. It is not clear how 'total' modifies this in any way.

(Disclaimer – We are currently working with another authority to adopt Mean annual runoff volume as an objective)

Metrics to assist you to evaluate risk of harm

'The following table is an additional tool…'. Could we use clearer language like 'the following objectives must be demonstrated to be achieved for all new developments'.

Appendix – Degradation of urban waterways

Someone will probably rightly point out that stormwater volumes in drier areas will be lower. The reductions required are proportionally higher but the volumes may not be. Suggest reword:

'Modelling suggests that to maintain the ecological values of many relatively healthy streams in Melbourne's growth areas, very high volumes of stormwater would have to be retained or reused. In particular, streams in the northern and western growth corridors are in drier parts of the city, and therefore would need higher stormwater flow reductions, as a proportion of total flow volumes, to avoid impacts.'

‘Heavy storms can flush stormwater and other forms of pollution into bays, lakes and streams, making them less safe for swimming, as evidenced by beach advisories in Port Philip Bay following storms.’

Suggest reword from ‘Heavy storms’ to ‘Storm events’. Most of the volume of pollutant loads occurs over many small events not the large ones so while this is technically correct, it may still be misunderstood and mis-interpreted as incorrectly suggesting most of the pollutant loads occur in heavy storms.

Economic impacts

Perhaps add

- Adverse impacts on commercial fisheries and water-related tourism

Environmental Justice Australia

Submission

in response to

Draft Urban Stormwater Management Guidance (Publication 1739)

prepared by

Environmental Justice Australia

16 December 2020

Environmental Justice Australia
ABN 74052124375

PO Box 12123
A'Beckett Street PO
Melbourne VIC 8006
L3, 60 Leicester St, Carlton

T (03) 8341 3100
F (03) 8341 3111
E admin@envirojustice.org.au
W www.envirojustice.org.au

About Environmental Justice Australia

Environmental Justice Australia (formerly the Environment Defenders Office, Victoria) is a not-for-profit public interest legal practice. We are independent of government and corporate funding. Our legal team combines technical expertise and a practical understanding of the legal system to protect our environment.

We act as advisers and legal representatives to community-based environment groups, regional and state environmental organisations, and larger environmental NGOs, representing them in court when needed. We also provide strategic and legal support to their campaigns to address climate change, protect nature and defend the rights of communities to a healthy environment.

We also pursue new and innovative solutions to fill the gaps and fix the failures in our legal system to clear a path for a more just and sustainable world.

For further information on this submission, please contact:

Dr Bruce Lindsay, Acting Director of Advocacy and Research, Environmental Justice Australia

T: 03 8341 3100

E: bruce.lindsay@envirojustice.org.au

Submitted to: Environment Protection Authority, urbanstormwaterbpem@epa.vic.gov.au

16 December 2020

Introduction

Environmental Justice Australia (EJA) is pleased to provide this submission on the Draft Urban Stormwater Management Guidance (Publication 1739, 2020) ('Draft Guidance').

EJA's interest in the issue of urban stormwater management arises from work undertaken in relation to urban waterways and rivers over the past several years, as well as a long-standing interest in environment protection (pollution) law including involvement in advocacy around the incoming reforms under the *Environment Protection Amendment Act 2018* (Vic).

Specifically, EJA has tackled the issue of stormwater management in various projects and cases since 2015 such as:

- Advocacy and law reform on the Yarra River (Birrarung), most recently in representation before the panel inquiring into the Yarra Strategic Plan at hearings in May-June 2020;
- Advocacy and law reform in relation to improved protection and restoration approaches to the waterways of Melbourne's west;
- Representation at IAC hearings in 2019 on the North East Link Project; and
- Representation before a 2019 planning panel considering Amendment C176 in Yarra Ranges Shire (concerning development adjacent to Brushy Creek).

In preparing this submission, we have had the benefit of a draft copy of the submissions prepared by Professor Tim Fletcher, Associate Professors Chris Walsh and Rebecca Nelson, and Dr Yung En Chee from Melbourne University.[1]

In respect of scientific and technical content on the Draft Guidance we would substantially defer to this submission. It is prepared by leading experts on stormwater science. This submission ought to be considered as containing the leading knowledge on the state of stormwater science nationally, if not globally.

Arguably, urban stormwater is the single most significant factor in past, current and ongoing degradation of urban streams. As urban design and development changes, and as urban development continues to expand outward in cities (both Melbourne and Victorian regional cities), urban stormwater management is a principal risk to manage in relation to the urban environment and urban ecosystems.

More correctly, the degrading influence of urban stormwater comes from urban drainage systems connecting impervious surfaces to waterways, with the principal intention of removing surface flows as hydraulically efficiently as possible during rain events. Fletcher et al refer to this as a measure of 'effective imperviousness'.

[1] Fletcher et al 'Comments on EPA Draft Urban Stormwater Management Guidance', dated 20 November 2020.

The function of stormwater in so-called 'urban stream syndrome'[2] is well-established and well-known, including as a diffuse source and cumulative pollution problem.

Insofar as the problem of urban stormwater is simultaneously one of water quality (biological and chemical composition of water) and flow regime (quantity, timing and hydraulic force) it comprises pollution in the broad sense of the term and presents relevant risks of harm ('adverse effect on human health or the environment'). Both composition (water quality) and the dynamics of flow (hydrology) are polluting factors and they are inextricably connected.

Noting that the Draft Guidance is intended to inform the 'state of knowledge' in relation to what is 'reasonably practicable' for the purposes of implementation of the duty by duty-holders, we make the following specific submissions.

Draft Guidance on risk in the context of environmental protection and ESD

We acknowledge that there are strong parallels and inspirations for the GED deriving from the analogous duty on employers under industrials to provide a safe and healthy workplace for employees and others undertaking work under the direction of employers. OHS law in this respect has been well-developed over many years both by the legislature and the courts. The legal matrix of factors deriving from the law of negligence is also relevant to the framing of the GED and parallels between torts law (duty of care) and environmental management has been drawn elsewhere.[3] Environmental duties of care in various guises are enacted under Australian statutes.[4]

There are overlapping characteristics in the OHS duty and the GED to the extent of risks applying to human health: in one instance, risks of harm concerning management of the workplace; in the other instance, risks from engagement in activities 'giving rise to' pollution or waste. But the object of the GED is distinguishable insofar as the risk of harm applies to the 'environment', which is not only a relatively broad object of protection (comprising both natural and social (amenity) characteristics) but in essence exhibits 'public good' or 'common good' qualities. The 'beneficiary' as it were of the protective scheme is typically natural systems not private entities (such as natural persons). In the case of stormwater management as a source of harm the 'public goods' at issue are commonly urban waterways. Risk minimisation to human health may be relevant in the design and operation of stormwater systems where, for example, stormwater poses flooding risks or contamination risks.

As a corollary of the distinct objective focus on the environment, the legal framing of the GED also takes account of the extensive suite of principles and considerations designed expressly for environmental management, especially as organised under the norms of 'ecologically sustainable development' (ESD). These principles are among those informing the Act. Among the more relevant ESD principles to the issue of stormwater management are the protection of biodiversity and ecological integrity and intergenerational equity. Under the EP Act amendments, these principles are

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[2] Walsh et al 'The urban stream syndrome: current knowledge and search for a cure' (2005) 24 *Journal of the North American Benthological Society* 3 706

[3] See eg Bates A Duty of Care for the Protection of Biodiversity on Land (Consultancy Report, Productivity Commission, 2001), https://www.pc.gov.au/research/supporting/biodiversity-duty-of-care

[4] See eg Catchment and Land Protection Act 1994 (Vic), s 20

drafted in terms of conservation or maintenance of environmental and ecological values,[5] either for their inherent importance or for future generations.[6]

In our submission, the Draft Guidance should expressly set out the role of ESD principles – and the principles of conservation and equity in particular – as framing risk management in relation to urban stormwater. This framing is practically of consequence given ongoing contribution of stormwater management arrangements to degradation of urban waterways. It should be clearly spelt out that a function of urban stormwater controls is demonstrably to arrest degradation of streams, at a minimum, and enable their recovery.

The nature of environmental 'assets' and processes in urban stormwater management as part of 'state of knowledge'

The Draft Guidance usefully includes a summary outline of adverse environmental impacts from urban stormwater in the Appendix (and referred to in the body of the Guidance). This description is relatively high level or conceptual in character and presumably borrows from the now well-established 'urban stream syndrome' theory.

Importantly, the Draft Guidance places the stormwater issue and the relevant knowledge base in this ecological context.

A fundamental departure of risk calculation in the environmental protection context, as distinct from the OHS context, is that the 'state of knowledge' needs to contemplate and reflect this wider environmental and ecological setting.

In our submission, however, this context will need to be set out in a sufficiently specific manner to enable elimination or minimisation of harm in actual circumstances in which 'activities' occur.

Given a principal focus of environmental protection in relation to urban stormwater is the landscape setting of water ecosystems and the hydrological cycle, the management of the relevant risks should be given fuller and more precise expression. For example, the relevant state of knowledge for any particular 'activity' should include:

- Ecological conditions of specific receiving waters or other affected natural environments (such as riparian zones);
- Hydrogeology, soils and substrates, especially as these are relevant infiltration and 'vertical' (groundwater-surface water) and latitudinal connectivity of waterways and wetlands as affected by the specific 'activity'; and
- Cumulative effects of 'activities' at a given scale (for example, catchment or subcatchment)

These types of considerations are referred to generally in the Draft Guidance.[7]

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[5] *Environment Protection Amendment Act 2018* (Vic), s 7, which will insert a new section 23 into the principal Act.
[6] *Environment Protection Amendment Act 2018* (Vic), s 7, which will insert a new section 21 into the principal Act.
[7] Draft Guidance, 6

The Draft Environmental Reference Standard provides one part of the relevant knowledge base although it is relative 'course' in scale compared to what is needed for management of stormwater risk at the level of particular 'activities'.

Stormwater controls designed or implemented inappropriately or without proper regard to their ecological setting can have perverse outcomes that exacerbate overall urban-environmental degradation.

For example, design and implementation of stormwater drainage systems based on 'bottom of (sub)catchment' collection of stormwater, typically in natural stream channels (augmented with constructed wetlands), in Melbourne's western growth corridors. In this setting, stormwater management is constructed around existing plains streams, which are a unique geomorphic structure with high degrees of groundwater-connectedness. Stormwater systems extensively replace infiltration and high degrees of vertical connectivity with conventional drainage connected to re-engineered and re-vegetated waterways. Ecological and hydrological regimes are extensively altered from their natural state (even accounting for prior rural land uses).[8]

Similar in-channel and/or riparian re-engineering approaches are, or have been, proposed for urban development elsewhere, such as the Amendment C176yran development on Brushy Creek[9] referred to above. While there are circumstances where constructed wetlands at 'end of flow' points on developments are appropriate, the problem is that these models are used as 'off the shelf' solutions without regard to the total ecological setting and/or the full complement of technical responses that may be available or should be brought within the scope of application. Additionally, as the Fletcher et al submission notes at length the metrics, standards and objectives presently employed in stormwater regulation (via the 1999 BPEM Guidelines) do not effectively reflect the present state of scientific knowledge in relation to the impacts or consequences of urban stormwater.

In stepping out the 'state of knowledge' for urban stormwater risks, the question of environmental or ecological setting poses certain nuanced considerations:

- What are the extent ecological values, especially associated with water ecosystems, and how are these to be safeguarded?
- How is urban stormwater management to function as an *intervention* into that ecological setting, including through technical measures and stormwater controls, and in a manner that, minimally, enables stabilisation or recovery of natural properties or processes (stormwater management as a form of 'nature-based solution')?
- Where and when is *re-engineering* appropriate, such as through constructed wetlands or engineering works, in order to manage stormwater risks by substantially altering local landscapes, either to human health (for example from flooding) or environmental protection?

[8] See eg Duncan et al *The feasibility of maintaining ecologically and geomorphically important elements of the natural flow regime in the context of a superabundance of flow: Stage 1 – Kororoit Creek study* (Technical report 14.5, Melbourne Water, 2014)
[9] *Yarra Ranges C176yran (PSA)* (2020) PPV 13 (7 February 2020)

In our submission, the framing of the response to risk embodied in the 'state of knowledge' should proceed sequentially through these questions. In doing so, the tendency would be to approach urban stormwater management from an ecological perspective and being to tie together risk management (protective) and restorative potential.

Reference point for elimination of risk is mimicry of natural flows

Target-setting and standard-setting are widely used to establish an intermediate level of management for stormwater, between high level objectives and applied techniques and strategies. From the 1999 BPEM onwards these have included load targets and flow targets. Fletcher et al critically examine these targets in their submission. We do not intend to traverse that ground in detail, other than to deal with the basic premise that they raise in their submission: what should be the desired condition of urban waterways as a consequence of urban stormwater management, or in other words what should be the desired reference point for stormwater management? Target-setting and reference conditions overlap and they tend to be quantitative and qualitative expressions of the same thing: desired outcome. In relation to flow targets, for example, under the 1999 BPEM the stated outcome is no further deterioration from pre-development condition in any particular project or development.

From the viewpoint of scientific opinion, considering the relationship between urban stormwater and stream ecology, the preferred outcome is restoration of a flow regime that mimics natural conditions,[10] or that otherwise re-establishes ecological integrity and dynamism to the maximum degree attainable.[11] In these respects, the scientific knowledge base is similar to the concepts and techniques employed in restoration ecology.[12]

The use of a 'natural flow regime' standard as a reference point, or benchmark, in the 'state of knowledge' in urban stormwater management seems to align, in principle, with the 'minimization' standard under the amended EP Act. Specifically, the incoming obligation is to prioritise 'elimination' of harm before considering opportunities to 'minimise' (or in other words, achieve less than elimination). In terms of quantitative measures, as Fletcher et al demonstrate in their submission, naturalising the flow regime and hence environmental risks arising from urban stormwater correlates negatively to what they term 'effective imperviousness' of development areas. Assuming 'naturalised' development condition, based on stream protection (and reflected in the conceptual diagram at Figure 3 of the Draft Guidance), can be read as the relevant reference state informing 'elimination'. In terms of applied metrics, Fletcher et al, building on long-term research, set out pathways toward or contributions to this 'naturalisation' process in an 'environmental benefit' index. They consider the Little Stringbark Creek project at length in their submission. This project and the work surround it should be considered as a leading example of the 'state of knowledge' for the purposes of urban stormwater management.

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[10] Fletcher et al 'Protection of stream ecosystems from urban stormwater runoff: the multiple benefits of an ecohydrological approach' (2014) 38 *Progress in Physical Geography* 5 543

[11] Walsh et al 'Principles of urban stormwater management to protect stream' (2016) 35 *Freshwater Science* 1 398

[12] See SER International Principles and Standards for the Practice of Ecological Restoration (2nd ed, 2019), https://www.ser.org/page/SERStandards/International-Standards-for-the-Practice-of-Ecological-Restoration.htm

In our submission the proposal in the Draft Guidance for scenarios reflecting 25% or 60% flow reduction targets are likely insufficient to achieve stream protective outcomes based on the available science. In other words, those targets are not responsive to the current 'state of knowledge'. As Fletcher et al's submission indicates, more precise and sensitive measures will be required in order to set targets. Targets will need to be responsive to outcomes (whether in terms of measures such as 'environmental benefit' or through setting reference conditions in other ways). Clearly reduction in flow targets are required but setting these quantitative figures is relatively arbitrary and also well below the notional level of flow reduction into receiving waters needed to achieve protection (at around 90%).

Draft Guidance should reflect full complement of major stormwater sources: public infrastructure

The Draft Guidance appears only to encompass conventional urban development scenarios, across both greenfield and infill developments. That is entirely appropriate, given such projects are an important source of the urban stormwater risk to which the GED and 'state of knowledge' is directed.

However, in our submission it is essential to ensure that all key source of impervious surface are targeted by the Guidance. In particular, public infrastructure such as roads, works and public spaces need to be accounted for in the final Guidance. We note that public authority orders may ultimately play a role in urban stormwater management in this respect. Roads specifically are a key source of urban stormwater. They not only contain high toxic pollutant loads (such as from heavy metals and hydrocarbons) that are distributed and hence a cumulative problem, but additionally the overall extent of the road system means they contribute extensively to stormwater flows. Stormwater management in relation to roads is not regulated under planning law. In our view, planning process for key infrastructure projects have largely dismissed proper or effective stormwater management. For example, for the Northeast Link Project the use of constructed wetlands as the principal form of stormwater treatment from road runoff confronts problems of relatively high cumulative pollutant loads and uncertain land budgets for the volume of runoff generated. No clear solutions to these problems have been forthcoming.

Thank you for the opportunity to make a submission on the Draft Guidance. EJA is available to discuss any matters raised in this submission further.

Brad Dalrymple
Ocean Protect
e: bradd@oceanprotect.com.au
p: 1300 354 722
m: 0417 746 408

16 December 2020

EPA Victoria
E: contact@epa.vic.gov.au

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 demonstrated by performance monitoring and not predicted by modelling.

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

Yours faithfully,

Brad Dalrymple
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.

Moreland Civic Centre
90 Bell Street
Coburg Victoria 3058
T: (03) 9240 1111

Postal Address
Locked Bag 10
Moreland Victoria 3058

www.moreland.vic.gov.au

December 16th 2020

Urban Stormwater BPEM
Environmental Protection Authority Victoria (EPA)
200 Victoria St
Carlton VIC 3053
By email (urbanstormwaterbpem@epa.vic.gov.au.)

Dear EPA Project Leader - Urban Stormwater BPEM

Feedback - Draft Urban Stormwater Management Guidance – Moreland City Council

Moreland City Council (Council) is pleased to make this submission to the Environmental Protection Authority (EPA) Victoria in relation to Draft Urban Stormwater Management Guidance.

Council congratulates and appreciates the time and effort the EPA has put into to developing this Draft Urban Stormwater Management Guidance, to provide more clarity and reflect more contemporary Stormwater management practices. Council would like to thank the EPA for providing this opportunity to provide feedback

Council is proud of its record of developing and delivering innovative initiatives that help lead the way for the local government sector in Victoria and Australia.

Council has a strong history and leadership commitment to tackling stormwater management issues. Including our current commitments via Council's statutory *Local Planning Policy C22.08 Environmentally Sustainable Development (ESD)* and recently endorsed *Integrated Water Management Strategy 2040 – Towards a water sensitive city* and associated *5 year Action Plan*. It is hoped that the finalisation of the Urban Stormwater Management Guidance will add to the suite of documentation to assist in ensuring stormwater is managed effectively in both the public, and private realm.

Below is summary of Council's feedback.

Language – Reasonably Practical
Council is concerned that "Reasonably Practical" wording is too vague and left open to interpretation. Council suggests that:

- Clear achievable performance standards ("minimum requirements") and wording are set for:
  - Council officers assessing developer responses as part of the planning system
  - Developers so that they know what their obligations are with certainty.
  - Council
    - so that we have certainty about what environmental targets and objectives we are seeking for stormwater management
    - so that enforcement and maintenance is considered.

- Additionally, guidance is required as to how the EPA's term and application of 'reasonably practicable' differs and compliments the term and definition of 'Best Practice' that is the overarching objective provided within Council's statutory Local Planning Policy C22.08 Environmentally Sustainable Development (ESD) within the planning scheme and that must be addressed when deciding a planning permit application. The interpretation and application of both terms, 'reasonably practicable' (as per section 1.1 of the document) and 'best practice' in the ESD Policy appear synonymous. Approximately 18-19 other Councils also have an ESD Policy within their Planning Scheme.

- Guidance is required for how and when the changes will be integrated into Clause 53.18 'Stormwater Management in Urban Development' in the Victorian Planning Provisions Victoria Planning Provisions (VPP)

- Section 2.1 (page 7) of the document details that 'reduction levels for solids, phosphorus and nitrogen' are 'required to be achieved' under the VPPs, however there are limitations with respect to language effectively utilised within such State provisions. Within a Council's Planning Scheme, the Planning Policy Framework (PPF) and Victoria Planning Provisions do not use binding language when referring to the *Urban Stormwater - Best Practice Environmental Management Guidelines (Victorian Stormwater Committee, 1999)*. Rather, the language uses the VPP's language of 'consider as relevant' (see, PPF clauses 14.02-1S and 19.03-3S), or that a 'stormwater management system should be designed to meet' the guidelines (see, VPP clauses 53.18, 55.03-4, 55.07-5 and 58.03-8). As such, it is not a strong 'requirement', per se, that the stormwater quality reduction levels and stormwater flow are strictly adhered to.

- With respect to Section 2.1 of the document, the test of 'reasonably practicable' should apply to both stormwater quality and flow criteria, not just stormwater flow. This is also supported by the point raised above given language utilised within a Council's planning scheme.

Quantitative Performance Objectives

Incorporation of flow in the draft guidelines is a positive addition to begin addressing the damaging erosive forces and ecological impact caused for excessive flow and velocity. However, further clarification/evidence is required:

- Are the 25% flow rate reductions suitable for all waterways (enough for some / too much for others)?
- Is the remaining 45% reduction of nitrogen enough for the bay to not have algal bloom?

Tools

Current tools are unsuitable or unable in their current form to assess the listed performance objectives:

- The STORM tool has reporting limitations and barely meets current BPEMG. With investment, it could be used to assess the new BPEMG. STORM is the most widely used by local councils and developers and is well accepted by the development industry. It is suggested that further funding is given to update STORM to address these performance requirements

- InSite Water is a commercial tool developed and maintained by a private organisation and is not as widely used, nor does it have a transparent governance and accountability framework. Council is concerned about the use of such a proprietary tool and lack of independent oversight.

Scenarios

- The section 3 scenarios (case studies) within the document are excellent to provide guidance to the development industry. Additional scenarios should be developed, particularly for townhouse, apartment, non-residential and commercial developments; ensuring that broad development typologies are covered.

- For residential development (e.g. medium density development such as dual occupancies and townhouses):

    - The current Victorian variation to the NCC regulation, whereby development either installs a 2,000L rainwater tank draining 50sqm roof area, or, a solar hot water system, is in need of review. This results in unintended unfavourable outcomes, such as: Tanks only of 2,000L being installed; inadequate solar hot water systems being installed; lack of heat pump hot water systems being installed; general overall industry confusion about the overlap and different between this NCC requirements and best practice stormwater management requirements.

    - Council supports larger sized tanks beyond the 2,000 litre statutory minimum (see National Construction Code 2019 Building Code of Australia part 3.12 which refers to the Plumbing Regulations 2018 (Vic) schedule 2, regulation 8).

    - In line with the scenarios, Council generally requests that rainwater tanks are sized to at least 2,500-3,000 litres and connected to all toilet flushing, laundry and irrigation areas. However, Council requires that the rainwater tank size is noted on Development Plans is for retention/reuse purposes and excludes any stormwater detention allocation/ components. The document should include this requirement to avoid industry confusion when sizing the rainwater tank and stating respective capacities.

    - With respect to Scenarios 1 and 7, 60-80% of the roof area servicing a rainwater tank appears reasonable and, in some cases, practical for most development. It is generally unlikely that 100% of a roof area will be connected to a rainwater tank (Scenario 9) unless charged piping is considered which has its design limitations. It should be noted here that Moreland City Council has undertaken a study into charged piping and will be publishing the study in the new year.

    - With respect to Scenario 8, a failure to maintain and service the raingarden/bioswale system along the property boundary may result in a private nuisance or negligence matter between lot owners. Additionally, the driveway will need to be angled to flow into such system, as well as, the raingarden/swale sized to at least 3-5% of the impermeable area. This is notwithstanding the servicing and maintenance required by the occupant to ensure continued performance and flow to the legal point of discharge (LPD) via such systems. Based upon such complexity, risk and pretences placed upon ongoing management, the design is not likely to be supported by Council.

Planning Considerations

- When requesting that applicants appropriately address stormwater/integrated water management and when writing planning permit conditions, Council heavily relies upon clauses 34 and 44 of the *State Environment Protection Policy (SEPP) (Waters)*.

- It is vital that the *SEPP (Waters)* clauses remain intact and are appropriately transitioned or translated to the Orders for Managers of Land or Infrastructure (OMLIs) or other suitable instrument.

- Guidance is required for Council, particularly when exercising decisions to grant planning permits, as to how Council should navigate the following legislative requirements/risks/duties, mainly with respect to flow and flood risks posed to existing development and infrastructure:

    - Environmental sustainability and climate change risk obligations under the *Local Government Act 2020* (Vic) sections 9(2)(b), (c); and

    - The general environmental duty under the *Environment Protection Amendment Act 2018* (Vic) part 3.2.

General feedback

- Further guidance and clarity are required regarding Proprietary products due to uncertainty and independent verifiability of the reported treatment results and the ongoing maintenance (sometime proprietary linked) concerns. Currently they are not accepted by Moreland City Council. There is increasing pressure to accept them as neighbouring councils do. The Stormwater Quality Improvement Device Evaluation Process (SQIDEP) work by Stormwater Australia has further complicated this. The SQIDEP approval process has added extra confusion and lack of consistency of approach across Victorian Council (as well as Australia). The process has not provided the certainty as intended, due to authorities such as Melbourne Water raising concern with the process. Council also has concern about this processes' governance arrangements, which seem overwhelmingly private based with a lack of independent oversight.

- Further guidance and clarity are required regarding stormwater offsets, such as are offsets considered equal to constructed works.

- Maintenance of private assets which are meant to make us meet current BPEMG needs to be addressed. Currently it is known that a proportion of private WSUD assets are not being maintained. Installation of further assets that give the appearance of stormwater quality and flow objectives being addressed, but due to lack of maintenance have no long-term ongoing impact, needs to be tackled.

- Further guidance and clarity is required regarding health concerns when connecting rainwater tanks to toilet flushing systems and/or laundry systems (i.e. washing machines) in aged care facilities and hospitals. Guidance regarding managing any foreseeable health risk with adequate filtration and treatment systems will only support additional uptake of such systems within such development; ensuring that the stormwater quality and flow objectives are met. The Department of Health publications and guidance materials should be revisisted to provide more certainty in such regard; working with the EPA on such deliverable.

- More emphasis should be given to construction and minimisation of the construction phases stormwater pollutants, given the significant quantities and pollution impacts that occur at construction stage.

It should also be noted that there are numerous overlapping guidelines and policies in the urban stormwater space. These policies include but are not limited to;

- IWM Forum Catchment Scale Integrated Water Management Plan (DELWP)
- Healthy Waterways Strategy (Melbourne Water)
- State Environment Protection Policy (SEPP) (Waters) (EPA Victoria)
- State Government ESD Policy (DELWP), currently under development

Care should be taken to ensure that the Draft Urban Stormwater Management Guidance complements and supports these documents and other stormwater management related guidelines and policies.

If you need further information, please contact me on 9240 2476 or vhart@moreland.vic.gov.au. We would welcome the opportunity to discuss our feedback to work with you develop guidelines that meet the needs of Local Government to enhance and protect the health of our waterways and manage urban stormwater for our environment and community.

Your sincerely,

VICTORIA HART
(ACTING) UNIT MANAGER – SUSTAINABLE BUILT ENVIRONMENT

16 December 2020

EPA Victoria
200 Victoria Street
CARLTON VIC 3053

Via Email (original not following in mail)

To Whom it May Concern,

RE: Draft urban stormwater management guidance (Publication 1739, October 2020) – Response under Consultation

Thank you for the opportunity to respond to the above-mentioned guidance paper. Spiire recognises this is a great step towards the enhanced management of stormwater and protection of Victorian waterways under increasing pressures due to urbanisation, population growth and climate change. We encourage the implementation of further guidance and recognise a risk-based approach to stormwater management allows for the variability in waterway values, catchment scales, and jurisdictions across the different developments that will be considered.

Nonetheless, we do have the following main comments on the guidance:

- Flow reduction targets:
  - These are spread over a range. Clarification on what governs this range is requested. What are the specifics? The fallback will always be the minimum if this remains unclear and makes decision making for authorities difficult.
  - Volume reduction targets in our experience render the other objectives, such as for stormwater quality treatment, almost meaningless (overly simple to achieve), and therefore requires further comment.
  - The targets are very hard targets to achieve without a form of indirect potable substitution, in our experience, as well as treatments at multiple scales (lot, street, regional). Who will bear the cost, operation, and maintenance? (Discussed more in below points.)
  - These targets must be considered based on buy in from relevant authorities – MWC, Council, water utility, with clear roles and responsibilities regarding funding, operation and maintenance. This is not clear from the paper and as such flow reduction targets will not be successful without proper governance mechanisms.
- With regard to capturing runoff (referred to in Section 2.2) and potable substitution:
  - This is subject to competing interests and risks with water authorities and potentially homeowners. The competing interests of wastewater or recycled water in the priority areas is also not discussed.
  - The responsibility of stormwater supply and treatment management falls onto the water authority or the council, rendering the targets meaningless if these operators are untrained or the systems are not maintained properly regardless of what the values of the receiving waterways are.
- To further reiterate the above, roles, responsibilities and ownership are undefined – the infrastructure required to achieve the targets will be designed in a mismatched way (at the different catchment scales), mismanaged once constructed and ineffective without proper

governance. Maintenance is a key issue. Without proper support Councils cannot maintain additional assets to ensure their proper function.

- Baseflow contributions will be difficult to achieve as this is in competition to collecting so much volume to achieve the volume reduction targets (in our experience). The designs should target low flows rather than baseflows from high flow events.
- The term 'reasonably practicable' used throughout the document is unclear and opens the door to 'optimisation' of treatment systems at the cost of the intent of the reduction targets regardless of the implementation of a risk management framework. Similarly, stating this is not a compliance document also renders the document meaningless in the context of development.
- How will this be implemented – through new PSP's only? How will cost be considered? It is important to consider affordability and the cost burden is not borne by one authority or region – particularly in the priority areas of lower socio-economic status. This is key to the success of the flow targets.
- How does it fit with other industry guidance? E.g. MWC Healthy Waterways Strategy, PSP specific IWM clauses, Victoria's IWM Framework, Water Authority recycled water strategies. If aligning with such documents, this must be clear.
- From Figure 1, in Section 2, all components are subsequently explained in the document except 'check controls' is not explained.
- Error reference in Section 2 of the first paragraph.
- Climate change is not mentioned in the document, despite being a significant pressure on potential infrastructure.
- The document references priority areas, which is a direct reference to the MW Healthy Waterway strategy. The documents need to provide a simplistic map and further information as to where the priority areas are and what are the associated targets/goals for these specific areas.

While Spiire welcomes innovation and policy changes within the stormwater space, we believe the success of the targets requires much more consultation and particular consideration to cost and responsibilities.

Yours sincerely,

Leigh Holmes
Principal
Spiire Australia

From: Beith, Scott <scott.beith@suez.com>
Sent on: Wednesday, December 16, 2020 3:33:47 AM
To: Urban StormwaterBPEM <urbanstormwaterbpem@epa.vic.gov.au>
Subject: FW: Draft urban stormwater management guidance

Hi EPA, Seasons Greetings!

My name is Scott Beith and I am the Environmental & Compliance Officer for SUEZ-ResourceCo Hampton Park RF, and as advised, I have reviewed the consultation draft for the Urban Stormwater Management Guidelines and have just one particular feedback/suggestion from within the field that may aid with its final draft.

To begin, I am glad to see table 1 will offer Quantative Performance Objectives for Urban Stormwater Quality Control. It is important to have comparative figures for an organisation to evaluate and react upon.

In addition to this table, I believe it would be of many companies personal interest to see if the measuring and monitoring practices for stormwater quality discharge can be better collaborated and unified into this document (as opposed to compliance revolving around multiple sources that are very difficult to locate in its entirety). From that, what I wonder and would wish to raise is whether it is possible for one (or more) physical 'test criteria lists' can be established in order to give a set level of conditions for 'stormwater' compliance testing (similar to the IWRG 621/631 charts and tables but for stormwater action/trigger levels). The addition of such charts would help companies diligently determine whether stormwater discharge is allowed to occur or whether remediation action is required. As also, it will provide universal values that can be easily tabulated based upon the distinct type of area that the stormwater is being sent to (i.e. which precise wetland/pond/basin a company is tasked to compare there stormwater water 'run off' too), for instance 'stormwater heading to wetlands' chart, 'stormwater heading to sedimentation ponds' chart etc.

To give an example, in circumstances of heavy rain, a landfill site may require an emergency stormwater discharge, where protocol then mandates for this site to test the water so that no pollutants are sighted and therefore a COA (certificate of analysis) can be raised. The evidence of this being used to either seek approval through EPA or to adhere to their own Environmental Management Plans allowing for the discharge to occur, and hence reducing any delay regarding whether this site can proceed straight to discharge or not – a common and serious problem should flood water begin rising and pose risks of potential leachate run off concerns.

It is my opinion that this current process could be better (faster) approved if there were a distinct group of charts for companies to follow (as opposed to trying to locate all various source information on their own), in that, EPA asks for such sites to do what is reasonably practicable to prevent environmental harm but can't offer absolute clarity/insight into actual 'test parameters/guidelines' for what would be construed as being 'safe/not safe' to discharge with. In light of this, many values and decisions can be (for lack of a better word) 'made up' since there's no direct protocol to go with (i.e. without definitive values it is my belief that decisions can become skewed/subjective rather than assessed by adequate scientific standards).

And so with examples like this in mind, I would like to stipulate that if a company can compare there analyte levels to that of a unified table corresponding to all outflows/reservoirs/wetland locations of which storm drains lead to, then it may become much more apparent for all relevant parties concerned where key requirements are regarding concentration levels of things such as Heavy Metals, Suspended Solids and/or Electroconductivity (for instance how salty can freshwater be before it is not considered fresh). Thus, what I would like to propose as a suggestion is whether a table of set values can be extrapolated from the same data sources companies use to create their EMP's (such as ANZECC, STORM/MUSIC/SEPP and AS1657) to provide a peer reviewed set of test parameters sites must all adhere to.

Outside of this concept, I believe the consultation draft is a concise and thorough read. I have no further recommendations upon it, thank you for the opportunity to provide feedback and I look forward to seeing the new EPA act and all that it encompasses next year

Have a great new year and take care!

Kind Regards,

16 December 2020

Ms Sigourney Irvine
EPA Victoria
200 Victoria Street,
Carlton VIC 3053

Dear Sigourney

Draft urban stormwater management guidance (publication 1739)

Thank you for the opportunity to provide feedback on the Draft urban stormwater management guidance (guidance document), released to industry on 21 October 2020.

Stormwater Victoria commends the effort required to develop regulatory reforms of this nature however based on feedback from our members, we cannot support the guidance document in its current form. The recommendations provided below will enable SV to support the guidance on behalf of our members.

As the key body representing organisations and individuals involved in stormwater management, Stormwater Victoria brought its members together on 24 November 2020 to seek their feedback and inform this submission. Based on the discussion, the following recommendations reflect our 279 members:

1. flow standards must use a specific number, rather than a target range. Use of a range introduces a level of ambiguity that is ineffective for statutory planners to achieve interventions commensurate with the level of risk

2. flow standards should adopt metrics that reflect the importance of both rainfall and impervious area. This ensures that the metrics reflect the most relevant and practical information when determining the level of harm from urbanisation on receiving environments

3. importance of a compliance mechanism cannot be understated and the use of 'reasonably practicable' in land use planning is considered unworkable without a clear compliance trigger, equivalent to current BPEM standards. Compliance under the Victoria Planning Provision at the release of the final is considered essential for successful adoption.

4. supporting policy mechanisms (e.g. roles and responsibilities, offsets, cost distribution analysis) will be essential to the success of the flow standards

5. more 'proof of concepts' be provided, particularly proof of concepts that detail the ongoing maintenance roles and responsibilities of any proposed asset

Based on the feedback from our members, successful adoption of the new flow standards would be aided by items 1, 2 and 3 being resolved prior to the release of the final guidance, with a commitment from relevant agencies that items 4 and 5 will follow. The complete submission below describes the above recommendations in more detail.

SV recognises that many of the items outlined within this submission sit beyond the immediate role of the guidance document and remit of the EPA. SV is committed to working with all parties to influence positive change and working with our members, the EPA, DELWP and others, to help enable the successful adoption of

the standards. In this regards, we welcome the opportunity to work with the EPA and DELWP in understanding industry needs to inform the final guidance document and supporting mechanisms. If needed, further meetings with our members can also be facilitated as part of this process. We are all in this together and SV are committed to changing how we manage urban stormwater to better protect (and improve) our environment.

Kind regards,

Jamie Tainton

President, Stormwater Victoria

Stormwater Victoria

Stormwater Victoria (SV) is the pre-eminent body in Victoria representing organisations and individuals involved in stormwater flow, environmental quality and use, adopting an integrated approach to stormwater management by encouraging interaction between the many disciplines and parties engaged in our industry.

SV provides leadership, professional support, and technical guidance on niche issues specific to stormwater management, and advocate to ensure sustainable stormwater management is fully integrated into broader discussions around water management and urban development at a state and national level through our links to Stormwater Australia and the network of state-based stormwater associations.

Stormwater Victoria represents 279 members, who are diverse, knowledgeable and committed professionals working across government, industry and academia from a range of technical and professional backgrounds, including engineering, landscape architecture, urban planning, education, environmental management, policy, sustainability and community engagement. Collectively, they bring a desire to support positive change for improved stormwater management and supports SV's shared vision:

Stormwater is an invaluable resource, and it is our vision that stormwater is integrated into holistic water management creating sustainable communities, connecting built and natural environments.

As an active leader in the water and urban development industries, SV plays a central role in bringing together government, industry, and practitioners to affect sustainable and holistic management of stormwater by:

- giving an independent and authoritative voice on stormwater issues which represent the views, interests, and concerns of its members;
- building a cross-disciplinary, cross-sectoral community of shared interest, collaboration, and responsibility in stormwater management;
- driving positive change, encourage innovative practices in stormwater service delivery to achieve improved environmental and sustainability outcomes;
- facilitating professional development, fulfilment, and growth for its members;
- communication and advocacy for better regulations, policy, and guidelines; and
- identifying and actively working towards new and innovative approaches in engaging and empowering the community in stormwater water management.

Finally, as the peak body for the stormwater industry, this submission represents the interests of our members for improved management of stormwater. In doing so, it advocates for robust regulatory frameworks that promote industry best practice, reflect well-established science and are supported by the necessary compliance and implementation mechanisms to ensure the required paradigm shift towards achieving flow standards within urban development.

Clear, accessible targets to drive change

The introduction of flow standards is a welcomed addition for the stormwater industry and reflects the well-established science linking significant ecological degradation to increasing urbanisation and principally, the altered flow regimes that are introduced as Melbourne continues to develop. In this regard, SV support of the introduction of flow standards. It must be noted however, that the diverse experience across our membership base have advised that introduction of a target range (e.g. 50-90%) will be ineffective in driving the desired outcomes. Reasons for this include:

- many developers will choose the lowest option of the range, therefore a minimum standard should be set from the outset
- statutory planning requires a specific number to inform performance objectives, this is a core requirement of the planning framework where clear criteria can be measured in assessment. Use of a target range will prove extremely difficult in practice for council officers and without clear performance objectives councils will likely be adverse to going to VCAT, even in instances where the intervention is disproportionate to the risk
- targets provided need to be achievable in both a metro and regional context at multiple scales. This target can be aspirational as long as government provides supporting policy and mechanisms that support implementation
- If aligning to targets within Healthy Waterways Strategy for priority areas, important to be explicit
- targets should be clearly linked to the mean annual runoff and impervious areas. These two factors are critical in determining the level of harm from urbanisation on receiving environments. These metrics should inform specific performance objectives that are required. Clear, accessible targets are essential for implementation.

In light of these considerations, SV recommends that the targets are revised to reflect mean annual runoff and impervious area. Use of these metrics will allow appropriate consideration of waterway health outcomes, ease of application in practice and result in suitable stormwater infrastructure. Further, SV recommends that a specific performance objective is used rather than a range and presented in a clear and accessible format.

Compliance through the Victoria Planning Provisions

It is understood that the approach to 'reasonably practicable' is well understood in the EPA and its use in long established risk prevention industries (e.g. occupational health and safety) has been effective. Its translation into the planning scheme framework is less clear. The extensive experience of our membership base has reinforced that without a clear structure, the necessary shift to adopt flow standards is highly unlikely. Reasons for this include:

- Uncertainties of how this will operate in practice – how will reasonably practicable be demonstrated? Will costs override the necessary environmental intervention? who will assess what is reasonably practicable? How will consistency be achieved? How will decisions be made or disputes resolved if referral agencies have no authority to act?
- Reasonably practicable is not measurable and open to interpretation. Its therefore impractical for a statutory planner to enforce as there are no clear performance objectives to measure. With no clear minimum expectations or authorising environment, a council is unlikely to invest time and money to progress outcome through VCAT

- Developers are looking for specific requirements on what needs to be done (minimum requirements). Ambiguity in this space is counterproductive to achieving a good outcome for the environment and community.

- Greenfield sites allow for innovation and opportunity to influence. Infill environments require a rigorous target and compliance to enable referral agencies to achieve change. This should be reflected in the targets.

In summary, the use of reasonably practicable has generated significant opposition amongst the SV membership as practitioners feel it will be ineffective in practice. SV strongly recommends that reasonably practicable is reconsidered and a clear compliance and authorising environment, via the Victoria Planning Provisions reinforces the flow standards when released to industry.

Ensuring successful adoption of flow standards

Sustainable stormwater management enables urban development while ensuring that waterways are protected from further decline and adapt to the impacts of climate change by providing an additional water source for community use and well-being. In this context, it is important that the guidance document reinforces the importance of management stormwater as both a challenge and opportunity.

Over recent years, the collective and collaborative effort towards integrated water management has gained significant traction and the industry has been calling for further stormwater reforms to support better stormwater management. To achieve the necessary shift of introducing flow standards, it is important to see government leadership, support and funding for a range of mechanisms, in summary:

- clear compliance mechanisms, without deferral to 'reasonably practicable' (see *Compliance through the Victoria Planning Provisions* below)

- achieving the flow targets will require new approaches to managing stormwater. Solutions will be required at multiple scales, where regional harvesting and reuse complements household and street scape initiatives. Clear roles, responsibilities, and funding mechanisms (both initial and ongoing) are required in order to achieve targets.

- it is important that tools for both design and compliance requirements are updated to support rollout. This includes industry training and capacity building to support adoption

- offset schemes will be an important component, particularly within infill scenarios. SV would recommend the EPA provide an expected framework for these within the 'Indicative Stormwater Treatment Scenarios' section of the document

- maintenance and enforcement is foundational to the long term success of stormwater management initiatives. Planning requirements, if not coupled with a strategy to resolve current challenges with maintenance is considered futile. At present, councils are unable to dedicate resources to ensure maintenance and enforcement of existing assets and are calling for government support to introduce new supporting mechanisms. Some examples in other states include:
  - Maintenance management plans as part of building approvals
  - Maintenance plans and Section 173 Agreements
  - Certificate of compliance at time of sale
  - Submitting an annual inspection report to demonstrate maintenance

- The higher flow standards proposed are occurring on the city fringes and it's important that the costs of delivering these assets are not met by lower socio-economic area resulting in higher house prices. The distribution of the costs is likely to be complex and require a range of policy options to balance benefits, costs and equity considerations.

SV recognises that reform of any nature is complex and requires a range of partners (e.g. EPA, DELWP, CMA's, LGA) and mechanisms to support change. While it is not expected that the items above are all resolved at the time of finalising the flow standards, it is essential the pathway to support adoption is set out with clear commitments as to the lead agency, timing and process.

Achieving flow standards

As stated above, achieving the flow targets will require new approaches to managing stormwater. Solutions will be required at multiple scales, where regional harvesting and reuse complements household and street scape initiatives. Initiatives that will support industry to achieve targets include:

- clear demands for stormwater needs a balanced approach between recycled water and stormwater for potable water substitution and supporting per urban agriculture. Without these clear demands, use of stormwater is limited
- consider opportunities for evapotranspiration to remove water from the system
- coordinated approach that demonstrate the best approach to improve waterways for each area
- proof of concept – demonstrations of sites with 25%, 50% and 90% flow reduction, as well as demonstration of the baseflow contribution. These proof of concepts should also show how the systems are being maintained (or plan to be maintained) to ensure that the environmental targets are continually met, not just at inception. Particularly for any proof of concept that relies on numerous 'private' assets (i.e. rainwater tanks) to achieve regional outcomes
- a clear methodology to enable validation of the stated metrics during a typical handover period

SV is committed to working with industry partners to support this change and encourages EPA and its partner agencies to consider the points above to support the successful transition to adopting flow standards.

20/11/2020

Comments on EPA draft urban stormwater management guidance

This submission comes from the Waterway Ecosystem Research Group (WERG, http://thewerg.org), and the Melbourne Law School, both based at the University of Melbourne, and from the Melbourne Waterway Research Practice Partnership (http://mwrpp.org), which is a partnership between WERG and Melbourne Water. This Partnership undertakes research with the aim of improving how waterways are managed across the Melbourne region.

We congratulate the EPA for initiating this project; stormwater has long been shown through empirical studies around the world to be a principal degrading mechanism of urban streams (King, Baker, Kazyak, & Weller, 2010; C. J. Walsh, Sharpe, Breen, & Sonneman, 2000), and improving the way it is managed to mitigate these impacts is critical to the long-term health of the streams of Melbourne and Victoria's regional towns and cities. We recognise that guidance based on best-available knowledge is crucial for assisting developers, affiliated sectors, 'responsible authorities' and public sector entities in understanding and fulfilling their General Environmental Duty. We note that it contributes to the 'state of knowledge'.

We thank you for the opportunity to provide comment on the proposed new guidance on stormwater management (document 1739). In making this submission, we have also reviewed the background information (document 1829) and the science review (document 1919). We refer to the three documents simply as the *guidance*, the *background* and the *science review*.

In framing this submission, we first focus on the substantive issues and principles regarding the proposed draft quantitative objectives for urban stormwater in the *guidance*. We then identify where we believe there is the greatest opportunity to improve the current guidance to reflect "best available knowledge at the time of publication" *(background,* p.15). This entails an alternative set of stormwater objectives with more direct links to the existing SEPP water quality and biological objectives. These alternate objectives derive from the long-running Little Stringybark Creek Project, arguably the most comprehensive experiment of stream restoration via catchment-scale stormwater management, worldwide. We describe the methodological and policy innovations that have been developed to implement these stormwater objectives, the community reception and adoption by the Yarra Ranges Council and the Department of Planning and Community Development. Finally, we consider the current presentation of the documents and opportunities to improve the communication of relevant knowledge to the intended audience.

Draft quantitative performance objectives for urban stormwater

The *guidance* suggests that "Performance against the objectives in Table 1 can be used as a signal of the level of risk of waterway values being lost or impacted." (p.7). Four of the objectives of urban stormwater, total suspended solids (TSS), total phosphorus (TP), total nitrogen (TN) and litter are reduction targets relative to mean annual load. The other three objectives relate to baseflow contribution and reduction in mean annual total runoff volume (flow reduction in priority areas for enhanced stormwater management and flow reduction in areas not identified as priority areas for enhanced stormwater management). Both the *basis* and *nature* of these objectives raise concerns.

The basis for targets; desired condition or accepted level of degradation?
Firstly, the BPEM-based targets for reductions in TSS, TP, TN and litter are *relative to no treatment* at the development site (Notes to Table 1, p.7). This approach aims implicitly to limit degradation in water quality resulting from the development site, but it does not explicitly consider the health and protection needs of receiving waterways. This appears to not directly support the SEPP water quality and biological objectives for streams. The SEPP stream objectives are set in terms of an *acceptable departure from reference condition*, while the BPEM targets are set based on a minimum improvement from the worst possible outcome (i.e. no mitigation). It is not possible from this latter to know how close the outcome is to an acceptable departure from the reference condition. But we note that the site-specific focus also takes no account of the context of development in the surrounding area and within the catchment, and therefore effectively ignores cumulative impacts.

We note that this disconnect between the BPEM targets and the SEPP objectives appears to originate at least in part from what appears to be a misunderstanding of the rationale behind the original BPEM targets, expressed in both the *background* document and *science review*. For example, the *science review* suggests that the BPEM targets (80/45/45/70% annual load reductions for TSS, TP, TN and litter) were "based on previous assessments around the reductions in nitrogen loads required to achieve outcomes in the Port Phillip Bay Study (Harris et al., 1996)"(p. 24). This interpretation is not entirely correct, and indeed, *the science review* also noted that "it is possible that the original load reduction targets were determined based on typical stormwater management technology load reduction performance at the time (Sage et al., 2015a), rather than a consideration of what is actually required to protect urban waterways" (p.24).

The BPEM targets (CSIRO 1999) were authored by a team that includes one of the authors of this submission, Tim Fletcher. We note the BPEM targets were *motivated*, at the time, by an identified need to reduce loads to Port Phillip Bay, but the setting of the targets was based primarily on two complementary pieces of logic:

1. The load reductions achieved by a "typical" stormwater treatment measure of the time (deemed to be a constructed wetland of area 1% of its catchment), drawing largely on research at the time from Duncan (1998),
2. A consideration of typical changes in pollutant loads from "rural residential" to "urban", also based largely on research by Duncan (Duncan, 1995a; Duncan, 1999; Duncan, 1995b)

The BPEM document (CSIRO 1999) considered that these load reduction targets provided a surrogate for the SEPP targets, but noted (p.16) that further monitoring data was required to confirm this, and that the targets are pragmatically based on current achievable practice (in 1996-1999, when this work was undertaken). Importantly, the BPEM guidelines explicitly identified the role of setting receiving water objectives (column 2 of Table 2.1, p.15 where the 80/45/45/70% targets are also presented), providing the load reduction targets as a "current best practice performance objective". It recognised that the proposed targets "may not be sufficient to achieve SEPP requirements in some waterways" (p.17).

Given this history, we believe the EPA should strengthen the *guidance* document to link it explicitly to the SEPP water quality and biological objectives (which are currently not mentioned at all). Below, we draw on lessons and methodological developments of the long-running Little Stringybark Creek project and elaborate on a feasible approach that directly links stormwater management objectives to water quality and biological responses. We would be pleased to work with EPA and relevant stakeholders to translate these into

stormwater management objectives and guidance that is transparently linked to receiving water needs.

Mean annual load reduction targets and percentage reduction in mean annual runoff volume targets alone do not adequately capture water quality and flow characteristics that are salient for stream protection

Here we wish to stress and illustrate the tight interdependency between the flow and water quality impacts of urban stormwater runoff, which in our view, does not come through clearly in either the *science review* or the *guidance*. While the *science review* explicitly separated water quality and flow as separate concerns, it is important to recognise that both pollutant loads objectives and the SEPP's water quality concentration targets are as much measures of flow as they are of water quality.

We contend that mean annual pollutant loads targets, while appropriate for protection of coastal embayments and other large receiving waterbodies, are inadequate for protecting receiving waters such as streams and wetlands. A mean annual load calculation takes an estimate of total flow over a year, multiplied by an estimate of pollutant concentration *as a function of flow*. Loads thus integrate across a long period, which is useful for large receiving waterbodies with long retention times, but of considerably less value for dynamic, variable systems such as waterways, and even more dynamic and variable 'flashy' stormwater runoff.

SEPP receiving water objectives for pollutants are expressed in the form of percentile concentration targets (CSIRO 1999), reflecting the understanding, as also noted in the *science review,* that pollutant concentrations can have stronger links to public health and ecological outcomes (p.24-25).

In catchments with minimal human impacts, such as forested catchments, stream pollutant concentrations tend to be correlated with stream discharge (e.g. Fig. 1A). In such catchments, increasingly large (and increasingly infrequent) high-flow events increase mobilization of contaminants from catchment soils, and from bank and bed sediments. The SEPP's 75th percentile concentration target aims to ensure that pollutant concentrations remain low for at least 75% of the time, when dry-weather stream flows are low. Forested Olinda Creek almost meets the relevant SEPP 75th percentile TP target of 0.055 mg/L (Fig. 1A) because in its dominant dry-weather (low flow) condition, concentrations in the creek are almost always below the target concentration.

The importance of stable dominant conditions with infrequent high-flow disturbances, implicit in the SEPP water quality objectives, is consistent with the ecological theory underpinning the principles for stormwater management for the protection of stream ecosystems proposed by Christopher J Walsh et al. (2016). The effects of conventional urban stormwater drainage on these dominant conditions is to reduce dry-weather stream discharge, and increase pollutant concentrations (e.g. Brushy Creek, Fig. 1B). As we can clearly see comparing Figs 1B and 1A, the value of its 75th percentile discharge (vertical dotted line at <0.3 mm/d) is very much lower than that of Olinda Creek (~1 mm/d) and most of its TP concentration measurements sit at much higher levels. Urban streams like Brushy Creek also experience spikes in pollutant concentrations when pollutants drain unpredictably down stormwater drains in dry weather (upper left region of Fig. 1B).

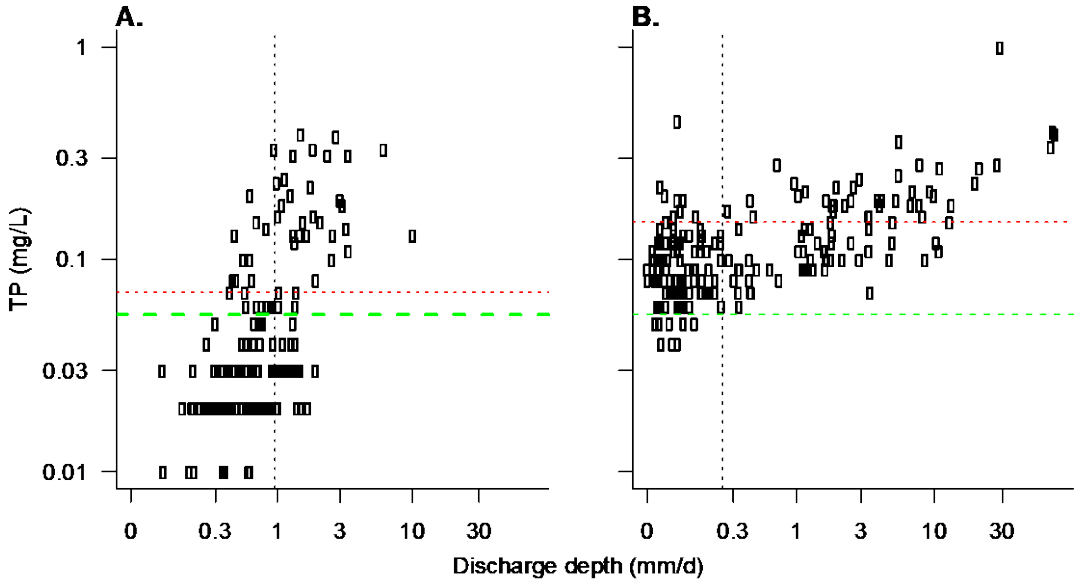


Fig. 1. Total phosphorus (TP) concentrations vs stream discharge for two small streams of similar size A. Olinda Creek (forested catchment with near-zero urban stormwater impacts) and B. Brushy (predominantly urban catchment with 22% effective imperviousness, EI). The vertical dotted line indicates the 75th percentile discharge, and the red horizontal line indicates the 75th percentile TP concentration. The green horizontal line indicates the SEPP objective for 75th percentile TP concentrations for lowland Yarra streams (0.055 mg/L). Data (from 2009-2019) from the Little Stringybark Creek Project.

Conventional urban stormwater drainage reduces dry-weather flows by reducing infiltration into catchment soils (although this effect can be countered by leakage from other water infrastructure in some urban areas: e.g. Bhaskar et al., 2016). It also greatly increases the frequency and magnitude of flow (and concomitant water quality) disturbances, as shown in the daily stream flow patterns of forested Olinda Creek (Fig. 2A) and urbanised Brushy Creek (Fig. 2B) over the course of a typical year.

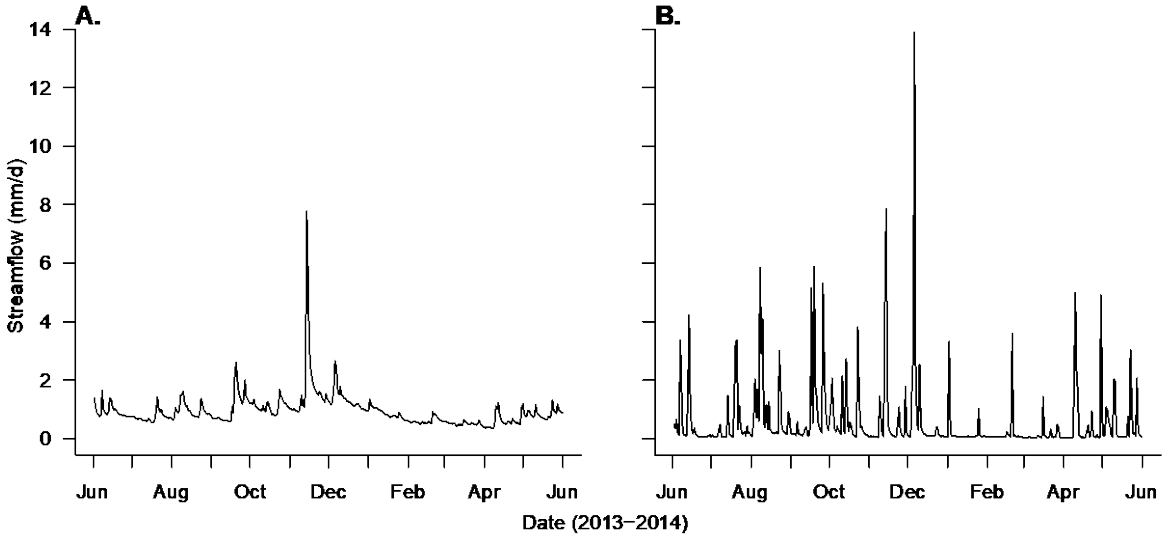


Fig. 2. After Burns, Fletcher, Walsh, Ladson, and Hatt (2012), contrasting daily stream flow patterns over a typical year in: A) Olinda Creek and B) Brushy Creek (see Fig. 1). Note higher baseflows, and much smaller high-flow responses to most rain events, with longer recession times in Olinda Creek. There was a single large high-flow disturbance in Olinda over the year compared to >20 in Brushy Creek.

An effective management response to mitigate these combined flow-regime and water quality effects must begin with a requirement that all impervious surfaces drain first to stormwater control measures that overflow only infrequently (Principles 2 and 3 Walsh et al 2016). Importantly, such a requirement would also provide the basis of means for effectively mitigating the cumulative impacts of stormwater runoff (see also Nelson 2019). Mean annual load reduction objectives *do not* clearly communicate such a requirement (for instance the TP load carried by <75th percentile flows (Fig. 1B) is <1% of Brushy Creek's total TP load).

Arguably, percentage reduction targets in mean annual total runoff volume of 25% (non-priority areas) or 50-90% (priority areas) have a similar shortcoming, when used alone, to mean annual loads as an objective—too long a time-scale for dynamic flowing waters, and also lack of specificity in how they are to effectively ameliorate the greatly increased frequency and magnitude of stormwater runoff flow disturbance.

Since the introduction of load reduction targets in the 1999 BPEM guidelines, design of stormwater control measures (SCMs) has focused primarily on filtration or biotic uptake of pollutants in wetlands or through bioretention systems with rapid flow-through rates. Such systems can reduce loads, but do little to dampen the greatly increased frequency and magnitude of flow disturbance (Burns et al., 2012). After 20 years of urban growth and redevelopment in Victoria under the 1999 BPEM guidelines, the only response to increased urban development that has been observed is further ecological degradation of waterways (e.g. degradation of the Yarra River at Templestowe, or Toomuc Creek downstream of the Pakenham growth corridor, Fig. 3). Alternative approaches to stormwater management for stream protection are clearly required (Christopher J Walsh et al., 2016).

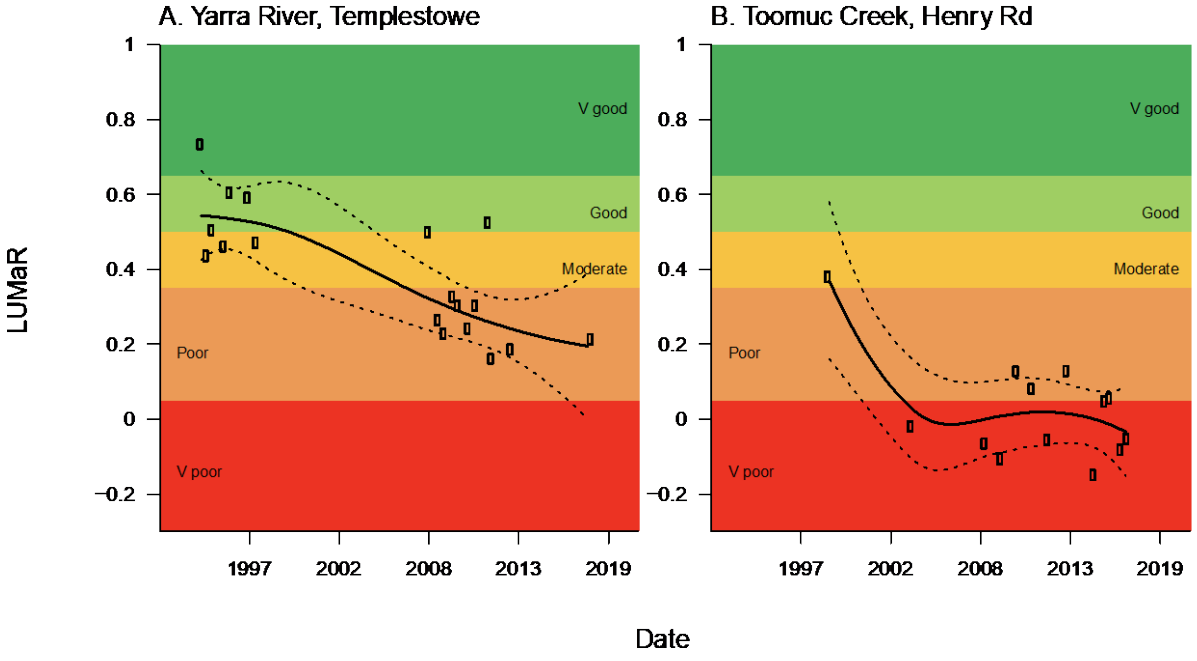


Fig. 3. LUMaR scores (a biotic index based on macroinvertebrate assemblage composition: see C.J. Walsh & Webb, 2013) for A. The Yarra River at Templestowe and B. Toomuc Creek downstream of Pakenham showing degradation over the last 30 years associated with urban growth.

Alternative SEPP-linked objectives for stormwater management and metrics for putting them into operation

Previously, we highlighted the inadequacy of mean annual pollutant loads reduction targets as measures of SCM efficacy for stream protection. We propose metrics for SCM performance that link to effective imperviousness (EI[1]), which is a strong predictor of stream ecosystem response. These metrics permit robust predictions of stream response (including of measures of SEPP compliance) to stormwater management actions that are not possible with loads-reduction objectives proposed by the *guidance*. While the metrics include elements proposed by the *guidance* (baseflow contribution and volume reduction), they are scaled between worst-case (conventional stormwater drainage) and target condition. The four metrics integrate the principles for stream protection proposed by Walsh et al. (2016). They are integrated into a single objective for ease of communication.

In this section, we describe the logic and derivation of our SCM performance metrics. In the following section, we describe how they have been applied as targets, which have been tested, implemented (through the Yarra Ranges Council and the Department of Planning and Community Development), accepted by a catchment community in the LSC Project, and have resulted in in-stream improvement consistent with predictions.

The degradation of stream ecosystems by urban stormwater runoff is well established, primarily through spatial studies that have demonstrated a strong negative relationship between indicators of ecological health and EI (Fig. 4). EI, in its original form (Leopold, 1968), only counted impervious surfaces that drain to a stream directly by lined stormwater conveyances. Impervious surfaces that drain to pervious land (informal drainage), allowing infiltration into catchment soils, were not included. In peri-urban eastern Melbourne, where stormwater infrastructure is heterogeneously distributed, EI is a stronger predictor of in-stream ecological degradation than is total imperviousness (i.e. including all impervious surfaces: Hatt, Fletcher, Walsh, & Taylor, 2004; C.J. Walsh, 2004; C.J. Walsh, Fletcher, & Ladson, 2005). While this is evidence that impervious surfaces are important contributors to stream degradation (even at very low levels), it does not follow that informally drained surfaces have no effect on streams, only that their effect is substantially smaller. While small, the effects of surfaces draining to pervious land are likely to vary with the length and nature of the flow paths between them and the stream.

Like informal drainage, stormwater control measures (SCMs) break drainage connection, and the degree to which they do so is a function of their specifications. SCM performance can be quantified by the degree to which the SCM mimics natural catchment processes (e.g. Walsh et al. 2009) and thereby reduces the EI of upstream contributing impervious areas. We can think of this as how well an SCM or SCM treatment train “discounts” the contributions of impervious areas to EI. For instance, a development with a combined harvesting and infiltration SCM that overflows only as frequently as large flow events occur in the receiving stream (at pre-development level), and provides filtered flows of a similar quality, quantity and flow pattern as from undeveloped parts of the catchment, is essentially fully disconnected. In other words, the contribution of this development to EI is reduced to zero by its SCM (in effect, discounted by 100%). Conversely, a development whose SCM retains only 1 mm of runoff before overflowing continues to count substantively towards EI (discounted by a tiny %).

[1] also known as directly connected imperviousness (DCI): the proportion of a catchment covered by impervious surfaces with direct drainage connection to a stream

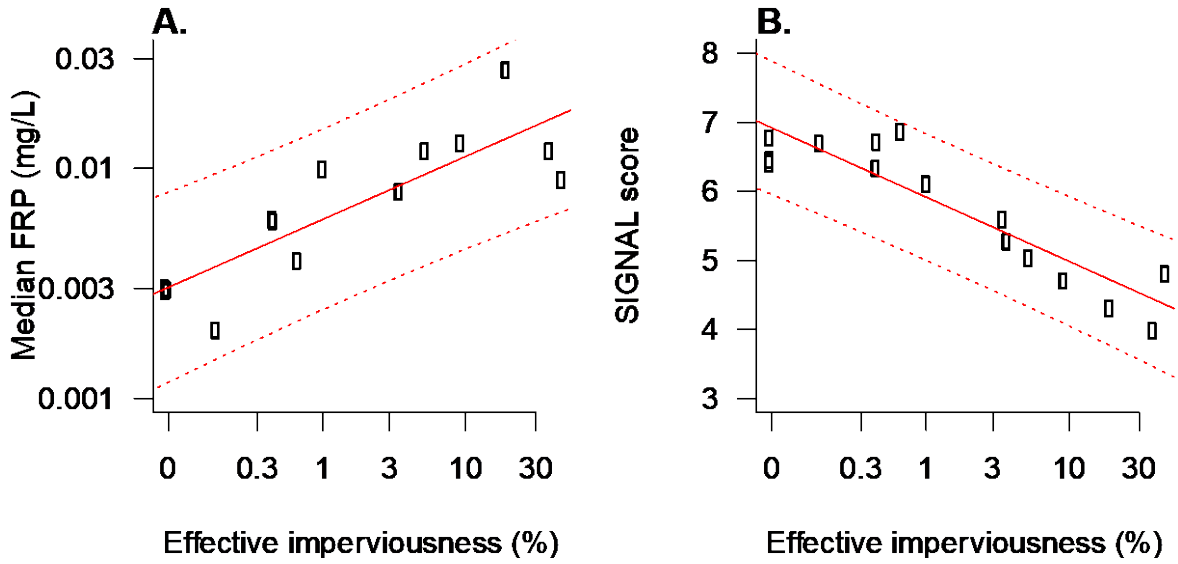


Fig. 4. Two variables related to SEPP water quality and biological objectives: A. Median filterable reactive phosphorus (FRP) concentrations and B. SIGNAL score (of edge samples) plotted against effective imperviousness (*EI*) values used by Walsh et al. (2005). The linear regression against $\log_{10}(EI + 0.001)$—solid red line with dotted 95% confidence limits—differs from the piecewise regression model (used by Walsh et al. 2005, to model a threshold). Five overlapping points are shown by slight jittering.

We developed a combined metric of SCM performance, the "Environmental Benefit" EB index[2] (Fletcher et al., 2011; C.J. Walsh, Fletcher, Bos, & Imberger, 2015), based on the principles for urban stormwater management to protect streams proposed by Christopher J Walsh et al. (2016). The EB index is the *average* of four sub-indices that measure ecologically-meaningful flow and water quality characteristics and *relate them to target/reference conditions*. The four sub-indices are:

1. Runoff frequency (RO) – the frequency of flows[3] that overflow from the SCM or that exceed the maximum acceptable flow rate for filtered flows (set by baseflow behaviour in reference streams). RO monitors runoff from impervious surfaces during dry-weather, and frequent small rain events, to target the primary cause of elevated dry-weather and every-day rain-event pollutant concentrations in degraded urban streams (Fig. 1B).
2. Filtered flow (FV) – the volume of filtered/treated flow contributing to baseflows at a rate not exceeding the maximum acceptable flow rate, where the optimal volume falls between streamflow ranges predicted for forested and pasture catchments (C J Walsh, Fletcher, & Burns, 2012; Zhang, Dawes, & Walker, 2001). FV aims to ensure filtration/treatment of flows returning to streams.
3. Total volume flowing to stream (VR) – the volume of water not lost through harvesting or evapotranspiration, with the target volume being streamflow ranges as for FV.

[2] See also: https://tools.thewerg.unimelb.edu.au/EBcalc/ and https://urbanstreams.net/lsc/EBcalctech.html. The EBcalc website is a compliance tool using open-source code that could easily be integrated into MUSIC freely by eWater, providing a user-friendly tool to industry. Equally, it could be adopted by EPA, DELWP or other agency, as part of the implementation of this new stormwater guidance.

[3] In publications in preparation, flows are weighted by the volume of each flow event: see also Walsh et al. 2009.

4. Water quality (WQ) – mean of indices based on predicted median[4] concentrations of TN, TP and TSS, using MUSIC estimates for conventional drainage, and SEPP concentration targets as reference. WQ aims to ensure that the filtration or treatment process meets SEPP objectives.

Note that each sub-index simultaneously targets both flow and water quality, because they are inter-related and interact to degrade waterways. Each sub-index is scaled between the level observed in the absence of stormwater control (i.e. conventional drainage, discount = 0%) and the target level based on reference (pre-development condition, discount = 100%). The closer to 100% the EB index, the more effective the SCM/SCM treatment train performance in reducing EI.

As an example, consider a 125 ha catchment with 10 ha of impervious surfaces connected to a conventional stormwater drainage system: EI = 8%. The drainage network ends in two separate drains that discharge into the stream, one with 4 impervious ha, and the other with 6. Let us now install many SCMs throughout the catchment, all of which overflow to the drainage network and ultimately either to a wetland at the end of the first pipe (4 impervious ha) or a bioinfiltration system at the end of the second pipe (6 impervious ha). Accounting for the performance of all the upstream SCMs, the wetland scores an EB of 75% and the infiltration system scores an EB of 90%. Discounting EI by these EB scores (EI_{EB}) reduces the catchment EI from 8% to:

$$EI_{EB} = (10 – 4*0.75 – 6*0.9)/125 = 0.013 \text{ (i.e. 1.3\%)}$$

Using data from the study reach where we achieved the greatest level of disconnection, we show the contrast between expected growth in EI over time in the absence of stormwater control (red, dashed EI line) and the reduction in EI achieved by SCM implementation explicitly guided by the EB Index (orange EI_{EB} line) (Fig. 5A). By 2014, SCM implementation had successfully reduced catchment EI from ~6% to <3% (Fig.5A).

The effect of the SCMs on TP (Fig. 5B) was consistent with the predicted response that we had inferred from the relationship between EI and TP among sites: a ten-fold reduction in EI approximately halved TP after 2 mm of rain in the previous day. However, the effect size varied with antecedent rain. Importantly, the effect of the SCMs was strongest during dry weather and the frequent small rain events, meaning that the SEPP target 75th percentile concentration was achieved after installation of the SCMs, but not without SCMs.

Analysis of biological responses is ongoing. We have not yet observed colonization of new taxa that would increase indices of biotic condition such as SIGNAL, but there is evidence that SCM implementation has increased abundance of more sensitive taxa. Recruitment lags and barriers may limit biological recovery. Further reduction in EI may also be necessary to achieve biological recovery.

[4] The use of median concentration for filtered outflows, which can be estimated from the MUSIC algorithm, is an adequate match for the 75th percentile SEPP objectives because stormwater flows are only generated on <40% of days, even in the wettest part of the state.

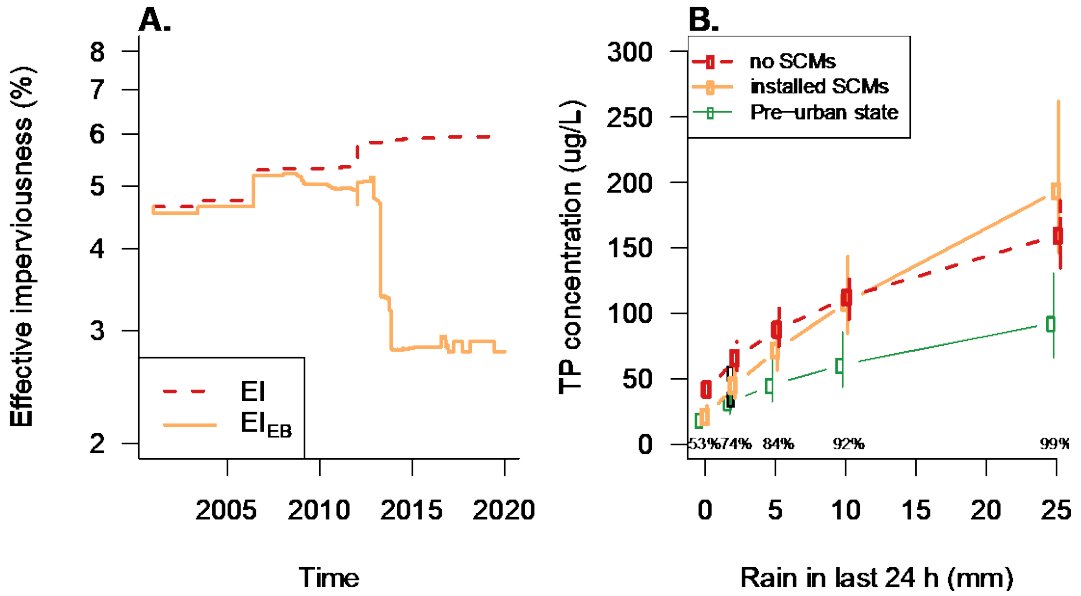


Fig. 5. A. Variation over time in EI (red, dashed line, assuming no SCMs), and EI_{EB} (orange, solid line, showing the reduced EI achieved by SCMs installed in the catchment with performance as estimated by EB scores: see text) in the Wattle Valley Creek catchment, in which the Little Stringybark Creek Project most successfully reduced urban stormwater impacts. B. Total Phosphorus concentrations in Wattle Valley Creek that were achieved in the project (orange, installed SCMs) plotted against rainfall in antecedent 24 h (*rain1*), compared to concentrations in the absence of SCMs (red, dashed) and those observed in reference streams in the absence of urban stormwater impacts (green). The values at each point are medians with 89% (thick) and 97% credible (thin) intervals predicted from a hierarchical model of TP variation over 20 years at 6 experimental sites, 2 control sites and 3 reference sites as a function of *EI*, change in *EI* as measured by EI_{EB} ($DEI_{EB,}$ i.e. the effect of the SCMs), *rain1*, rain in antecedent year, channel disturbance and interactions *of EI*, DEI_{EB} with *rain1*. (Upublished manuscript in preparation). The percentages indicate the proportion of days with less rain than each value of Rain1. The grey filled points at the 75th percentile rainfall (~2 mm rain1) are the SEPP objectives for TP: 35 mg/L for upper Yarra streams, which matches the pre-urban state well, and 55 mg/L for lowland Yarra streams, which this site was not achieving prior to SCM installation, but was surpassed with SCM installation.

Our process-based indices permit prediction of stream response if an SCM or SCM treatment trains of known specifications are implemented. The indices thus permit setting of objectives for SCM design and performance that have a high probability of achieving SEPP objectives, and determination of the degree of degradation that is likely for non-complying SCMs.

Real-world application of the alternative stormwater management objectives and their reception by the community, local and state government: the Little Stringybark Creek Project

The LSC Project, as a large-scale experiment, implemented its SCMs using the EB Index to prioritise SCM investment to ensure the greatest protection from urban stormwater runoff for minimum cost, given the finite project budget (Bos & Brown, 2015; Nemes et al., 2016). Further, to ensure the long-term protection of the investment, and to permit progressive increase in stream protection as building stock in the catchment turns over, we worked with Melbourne Water, Yarra Ranges Council (YRC) and the Victorian Department of Planning and Community Development, to develop stormwater management objectives for all new constructions in the Little Stringybark Creek catchment. These objectives are formalised as requirements for all new constructions in the Little Stringybark Creek catchment (Rossrakesh et al., 2012), under a Yarra Ranges Council ordinance (the LSC Environmental Significance Overlay, ESO). The LSC ESO and its objectives, adopted into the

Yarra Ranges Planning Scheme (through the Department of Planning and Community Development), have been well accepted by the catchment community (Melbourne Water, 2017). A survey of planners found fair capacity in administering the ESO and that the ESO process was functioning fairly well (Melbourne Water 2017). The YRC have also committed to ensure any council works not covered by the ESO will also meet the objectives.

The LSC ESO objectives use a variant of the EB Index (excluding the water quality sub-index, for simplicity of calculation) and require a minimum achievement of 60% of the best possible index score for every development. Compliance has been facilitated and ensured by technical staff providing analyses with custom-built software. EB Index and sub-index scores (including the water quality sub-index) can also be calculated with MUSIC, but a simple-to-use module in MUSIC for this purpose still needs to be developed. Discussions with eWater (the custodians of MUSIC) on the development of this module have commenced and this capability is expected to be available within MUSIC by mid-2021.

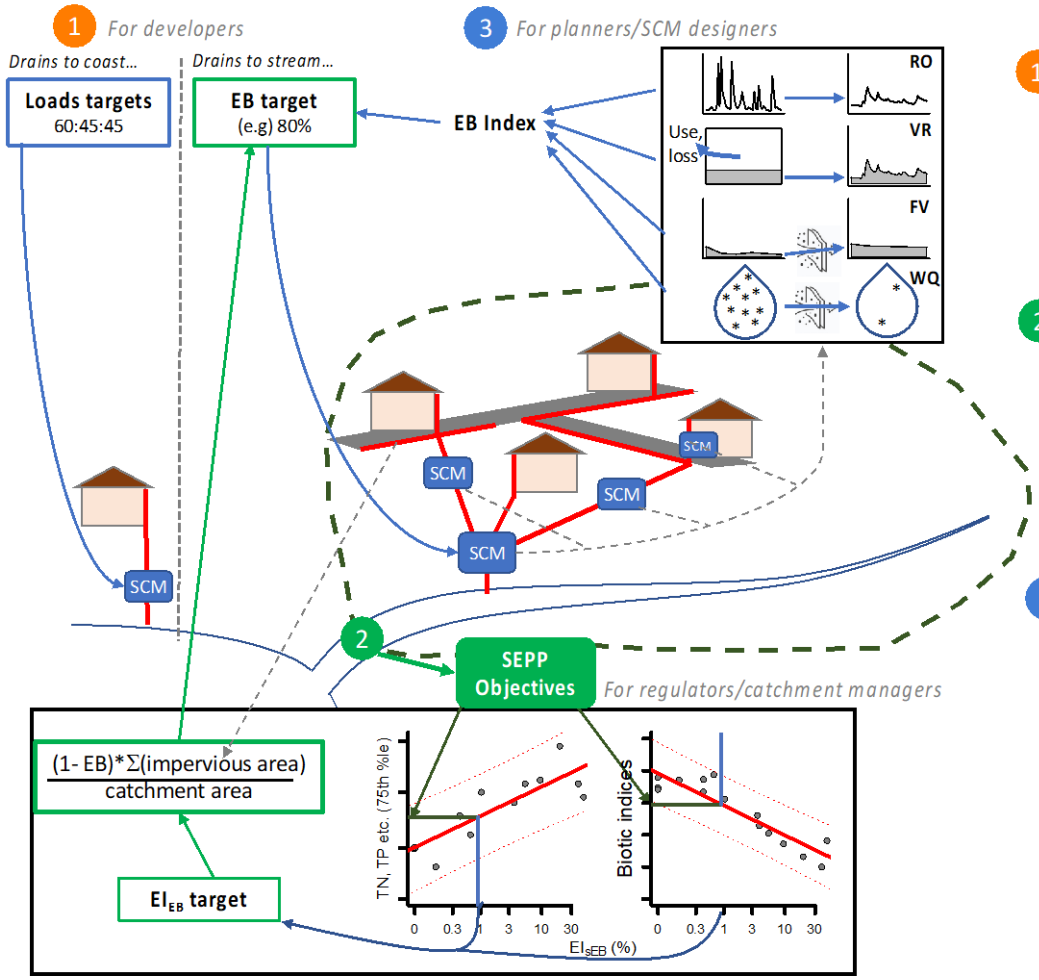
Outline of a decision process for the alternative stormwater management objectives

Whilst there is some complexity in the calculations for the EB Index (and its component sub-indices) it can be easily handled with software tools "working in the background". A clear and transparent decision process for implementing the alternative SEPP-linked stormwater management objectives could be framed for developers, affiliated sectors, 'responsible authorities' and public sector entities. We provide a schematic example of such a process with clear decision points and requirements for developers, regulators or catchment managers and planners and SCM designers (Fig. 6). As we can see, the outlined approach takes a 'catchment-view' of developments (not just a site-specific view), thereby allowing the regulator or catchment manager to take account of cumulative stormwater runoff impacts and mitigate these by setting an appropriate EB target.

In summary, these alternative stormwater management objectives:

a) have been successfully trialled, implemented in practice in the Little Stringybark Creek Project and formally incorporated into the Yarra Ranges Council Planning Scheme
b) have the ability to predict SEPP objective compliance (based on the demonstrated relationships between SEPP objective metrics and EI, both in degradation [Fig. 4] and in restoration [Fig. 5B])
c) have demonstrated the possibility of restoration of degraded streams through well-designed SCM implementation explicitly guided by these objectives. (This demonstration provides strong evidence that protection of stream ecosystems in greenfield settings can be achieved with this approach.)
d) are scalable from site scale to catchment scale
e) provide the means to genuinely mitigate the cumulative impacts of urban stormwater

In light of the demonstrated feasibility and benefits, we submit that these alternative stormwater objectives (or similar) and the methods for putting them into practice should be included in the *guidance*.



1 ***For developers***, the proposed standard will require meeting one of two targets. If the development drains directly to coastal waters, **loads target** apply. If it drains to a river, stream, or small estuary, stormwater control for the development must meet a single **Environmental Benefit (EB) target**, expressed as a percentage.

2 ***The target is set by the regulator or catchment manager*** with the aim of meeting the relevant SEPP objectives. The EB target is calculated by determining the effective imperviousness required to meet the SEPP objectives (EI_{EB}). The EB target is then set by estimating the ultimate catchment impervious coverage for the catchment.

3 ***Planners & stormwater control measure (SCM) designers*** can then design SCM treatment trains by maximising performance in each of the EB sub-indices: runoff volume (RO), volume reduction (VR), Filtered flow volume (FV), and water quality (WQ). SCMs upstream of the terminal SCM should improve its EB: for instance, maximal harvesting with no infiltration is acceptable for an upslope SCM, if it improves the EB of the downslope infiltration system. It is highly likely that achieving the EB target will also achieve the loads reduction targets. The proposed volume reduction targets are also met by the VR sub-index.

Fig. 6 Conceptual outline of a decision process for how the proposed stormwater management objectives could be implemented.

We note that in addition to the Little Stringybark Creek Project example, there are other precedents and examples of ambitious, process-based, quantitative stormwater management objectives with stronger links to SEPP objectives. The flow objectives adopted by Melbourne Water's Healthy Waterway Strategy (HWS) are a case in point. The HWS implementation of this objective is superior to that proposed for the guidelines in that the required volume reduction is set as a function of mean annual rainfall, and therefore implicitly scaled to the target condition. Volume reduction is useful because it emphasises that a major challenge in meeting runoff frequency and filtered volume targets is the need to prevent large volumes from flowing to the stream: this is the case both for dry catchments with intermittent or ephemeral streams and wet catchments (Duncan, Fletcher, Vietz, & Urrutiaguer, 2014) with perennial streams (Duncan, Fletcher, Vietz, & Urrutiaguer, 2016). But stream protection also requires explicit emphasis of the need to manage those impacts that directly degrade stream ecosystems: increased frequency and magnitude of polluted flows, and reduced dry-weather flows. It should also be noted that volume reduction is an annual measure, and therefore has similar a shortcoming to loads as an objective – too long a time-scale for dynamic ecosystems such as rivers. However, volume reduction is a useful objective for communication and encouragement of a primary tool for stream protection, if it is used in tandem with RO, FV and WQ.

Other comments on the proposed guidance

Delivering effective stormwater guidance, as outlined above, requires clear communication of the nature of the stormwater problem, and the opportunity that it presents.

The importance of hydrology (and pollutant concentrations)

As noted in the *science review* and *background* document, the role of hydrology as a primary degrading mechanism of urban waterway health is now well understood and described by empirical scientific studies, both in Australia and internationally. We note also that reduction of a given volume of stormwater runoff flowing to a stream removes 100% of the pollutants in that flow; the benefits of this are demonstrated in the description of the Little Stringybark Creek Project. This seemingly obvious point is not made in the main body of the *guidance* document, meaning that readers may not understand how central flow regime management is to managing stormwater's impacts on waterway health and water quality. The point is made in the Appendix of the *guidance* document, but we believe it is a point that should be clearly and prominently made early on in the *guidance* document. It could also be supported in the *background* document (e.g. the bullet list on p.6, or the description on p.7 of the BPEM guidelines only being about water quality, which is not correct: see Nelson 2019, p. 786).

It is also important to be consistent on the point of stormwater runoff flows being the cause and conveyor of pollutants, and of spikes in pollutant concentration **(we note here also the importance of concentrations to stream ecosystems, as expressed by the concentration-focus of the SEPP objectives for stream water quality**). For instance, on page 8 of the *guidance* document, the sentence, "Preventing harm from urban stormwater by minimising pollutants and increased flows…" seems to confuse the matter. We believe it would be better to describe stormwater management as needing "*to achieve water quality and flow regimes that can support healthy stream ecosystems"*. Such an argument is far more consistent with the SEPP objectives, which ultimately underpin this guidance.

While the interaction of hydrology and water quality is noted and described by the new *guidance*, there are some surprising omissions in the document that undermine its ability to communicate the combined and interactive effect of changes to flow and water quality regimes. An important example of this omission is in the introductory section on p6 of the

background document, where a bullet-point list is provided, which includes the need to reduce pollutant loads, but omits the need to "reduce changes to the flow regime" and does not link to SEPP concentration targets. While the authors of the *background* document clearly understand that all are required, omitting this in this vital early stage of the *background* risks reinforcing the common misconception that stormwater management is only about load reduction.

Given the centrality of hydrology as a degrader of waterway health, we would argue strongly that EPA and other stakeholders such as DELWP need to work to ensure that flow targets are supported by appropriate performance standards and compliance arrangements. Perversely, the wording throughout both the *guidance* and *background* documents appears to encourage the reader to ignore flow, repeatedly noting that proposed flow reduction objectives are not compliance requirements (three mentions in the space of 14 pages of the *background*). This seems to guarantee that the flow management guideline will be ignored, just as the BPEM guidelines' flow management target (through Clause 56) has been universally ignored. If this is the outcome, this new *guidance* will have little practical effect, which would be a great pity.

To assist duty holders to understand their duties in a way that recognises the connections between flows, pollutant concentration, harm, and their own responsibilities, the *guidance* should explain the relationship between the flow and pollutant reduction objectives (which are expressed in the aggregate, as cumulative effects) and the factors relevant to what will be considered 'reasonably practicable' at the level of individual duty-holders. In other words, duty-holders need to understand how to respond to their individual contribution to cumulative impacts, which is explicitly recognised in the 'Reasonably Practicable' publication (Pub 1856, p. 9) but not mentioned explicitly in the *science review*, *background* or *guidance* documents. By definition, considering cumulative impacts requires considering the effect of an individual action in the context of all previous and imminent degrading actions. We suggest that the *guidance* explains the relationship between cumulative targets, the 'consequence' of harm, and the assessment of risk of harm that all influence what it is reasonably practicable for the duty-holder to do. We note that other governments consider that the harm of an individual action should be understood as *more* significant (i.e. of higher consequence) where pre-existing cumulative impacts are higher (Australian Government Department of the Environment, 2013; Eccleston, 2006). At minimum, the *guidance* should suggest that the fact that a receiving waterway is relatively degraded does not mean that duty-holders have a reduced obligation to address flows relative to other areas.

On a related note, given that the intent of the General Environmental Duty is to prioritise preventing harm, the *guidance* could also be strengthened by taking every opportunity to emphasise that the first consideration with respect to 'reasonably practicable' is elimination of the hazard/risk (doc 1856, p4). Elimination of the stormwater runoff hazard is currently not mentioned anywhere in the main text of the *guidance*—it only appears in footnote 1 and Figure 2. The notion of using integrated water management thinking and design as a control for preventing harm by eliminating or minimising risks from stormwater runoff is also surprisingly absent from section 2.2 on 'Implementing controls' in the *guidance* document. The following section explains the importance and tangible benefits of these perspectives.

Treating stormwater as a risk, an opportunity, or both?

The *guidance* is explicit in presenting urban stormwater management within a risk framework. While this is a helpful framework, we see the complete omission of

opportunity as counter-productive to the aims of this *guidance*. While the EPA's regulatory framework aligns well with a risk-based approach, the ability to convince developers and others of the merits of improving stormwater will also depend on their perception of costs versus benefits.

If the audience of this *guidance* are convinced of the potential benefits—to them—of improved management of stormwater, they will be more likely to comply with the guidance being given. Specifically, section 2 should be re-framed to communicate the potential opportunities that improved stormwater management provides, including:

1. Provision of a cost-effective supplementary or alternative water supply (e.g. Marsden Jacob Associates, 2007)
2. Reduction of flood-mitigation requirements (e.g. Burns, Schubert, Fletcher, & Sanders, 2015)
3. Enhancement of urban amenity (e.g. de Graaf & van der Brugge, 2010)
4. Mitigation of urban heat island effects (e.g. Endreny, 2008)
5. Improved health and resilience of urban vegetation (e.g Grey, Livesley, Fletcher, & Szota, 2018)

Given the imperfect nature of compliance efforts around stormwater management, we believe it is imperative that the EPA's regulatory framework – which is focussed around risk – not constrain the *effective communication* of stormwater as a simultaneous risk and opportunity. Where compliance is imperfect, willing engagement of stakeholders in the prescribed management approach is critical.

The central role of harvesting in any feasible solutions

Given the central role of the flow regime, it is our view that the *guidance* document does not adequately explain the importance and opportunity of stormwater harvesting in the early parts of the document. This means that the reader is not well prepared for the presented scenarios, many of which rely quite strongly on rainwater or stormwater harvesting. Specifically, we suggest:

1. As described previously, revise section 2 (Managing urban stormwater risks) to present both the risks and the opportunities. This could be done in a way that maintains the risk framework as is (ie. as Section 2.1), but adds another section (2.2) on "Managing urban stormwater opportunities"
2. Renaming "stormwater treatment examples" and similar terminology to "stormwater management examples" (and similar). This is a subtle but important change, because the use of "treatment" implies water quality only, adding to an implicit focus in the *guidance* document on water quality alone, rather than properly integrating the combined, interactive threat of flow and water quality regimes.

Differentiating standards between "high value" and "low value" reaches/catchments

The guidance draws on the distinction of priority areas for enhanced stormwater management, from Melbourne Water's Healthy Waterways Strategy. The rationale that high-value waterways should be given highest priority for restoration and protection efforts was first outlined in the Rutherfurd et al.'s (2000) stream rehabilitation manual. This concept argues that investment of (typically public) funds in stream rehabilitation should be prioritised towards waterways with significant value.

We do not believe it is appropriate to simply apply this logic to stormwater management standards. The demonstrated potential for restoration of streams degraded by urban

stormwater runoff, and the acceptance of the LSC ESO that will permit progressive reduction in EI as building stock turns over in the catchment, points to the importance of strong objectives for stormwater retention and treatment in catchments draining to streams already damaged by urban stormwater runoff. Allowing development in non-high-value waterway catchments to proceed with lower standards results in greater degradation. This effectively results in future generations subsidising today's developers in non-high-value catchments, transferring the cost of meeting standards today to future generations in restoration efforts. This approach also risks being seen as allowing ecological 'sacrifice zones' in a way that is inconsistent with recognising the social value of waterways (recognised explicitly on p. 11 of the *guidance*). It would appear difficult to justify such differentiated protection of social value. This prioritisation logic also risks undermining significant investment in planned restoration efforts for currently degraded waterways (e.g. Chain of Ponds Collaboration) by applying standards that allow continued and greater degradation depending on the current condition of a waterway.

We believe that the Rutherfurd et al. (2000) prioritisation logic is thus appropriate for guiding of public investment, but should not be used to differentiate the degree of allowable degradation to waterways, based on their current condition.

Utility of the provided scenarios

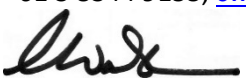
We believe that the scenarios presented in the *guidance* are a very useful inclusion; they give the practical solutions to achieve the specified objectives. In general, they are clear, practical and helpful. We think it could be helpful to provide some form of conceptual diagram to help guide readers in which scenarios they may apply in what situation.

If you have any questions regarding this submission, please do not hesitate to contact us. We would be happy to provide further information and/or a briefing. We are keen to work EPA and relevant stakeholders on developing stormwater objectives that give our streams a genuine chance of meeting SEPP targets and methods for their implementation.

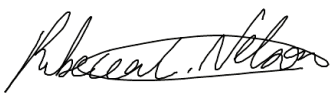
Yours sincerely,

Tim Fletcher
Professor of Urban Ecohydrology
+61 3 9035 6854, timf@unimelb.edu.au

Christopher J Walsh
Principal Research Fellow
+61 3 8344 9155, cwalsh@unimelb.edu.au



Rebecca L Nelson
Associate Professor, Melbourne Law School
+61 3 8344 0436,
rebecca.nelson@unimelb.edu.au



Yung En Chee
Senior Research Fellow
+61 4128 361 35, yechee@unimelb.edu.au

Cited references

Australian Government Department of the Environment. (2013). *Significant Impact Guidelines 1.3: Coal Seam Gas and Large Coal Mining Developments—Impacts on Water Resources*. Retrieved from Canberra:

Bhaskar, A. S., Beesley, L., Burns, M. J., Fletcher, T. D., Hamel, P., Oldham, C. E., & Roy, A. H. (2016). Will it rise or will it fall? Managing the diverse effects of urbanization on base flow. *Freshwater Science, 35*(1), 293–310.

Bos, D. G., & Brown, H. L. (2015). Overcoming barriers to community participation in a catchment-scale experiment: building trust and changing behavior. *Freshwater Science, 34*(3), 1169–1175. Retrieved from http://www.jstor.org/stable/pdfplus/10.1086/682421.pdf

Burns, M. J., Fletcher, T. D., Walsh, C. J., Ladson, A. R., & Hatt, B. E. (2012). Hydrologic shortcomings of conventional urban stormwater management and opportunities for reform. *Landscape and Urban Planning, 105*(3), 230–240. doi:doi:10.1016/j.landurbplan.2011.12.012

Burns, M. J., Schubert, J. E., Fletcher, T. D., & Sanders, B. F. (2015). Testing the impact of at-source stormwater management on urban flooding through a coupling of network and overland flow models. *WIREs Water, 2*(4), 291-300. doi:10.1002/wat2.1078

de Graaf, R., & van der Brugge, R. (2010). Transforming water infrastructure by linking water management and urban renewal in Rotterdam. *Technological Forecasting and Social Change, 77*(8), 1282-1291. doi:10.1016/j.techfore.2010.03.011

Duncan, H. P. (1995a). *A bibliography of urban stormwater quality*. Melbourne, Australia: Cooperative Research Centre for Catchment Hydrology (Report 95/8).

Duncan, H. P. (1998). *Urban Stormwater Quality Improvement in Storage.* Paper presented at the HydraStorm 98, 3rd International Symposium on Stormwater Management, Adelaide, Australia.

Duncan, H. P. (1999). *Urban Stormwater Quality: A Statistical Overview* (Report 99/3). Retrieved from Melbourne, Australia:

Duncan, H. P. (Ed.) (1995b). *A review of urban stormwater quality processes*. Melbourne: Cooperative Research Centre for Catchment Hydrology (Report 95/9).

Duncan, H. P., Fletcher, T. D., Vietz, G., & Urrutiaguer, M. (2014). *The feasibility of maintaining ecologically and geomorphically important elements of the natural flow regime in the context of a superabundance of flow: Stage 1 – Kororoit Creek study.* Retrieved from Melbourne:

Duncan, H. P., Fletcher, T. D., Vietz, G., & Urrutiaguer, M. (2016). *The feasibility of maintaining ecologically and geomorphically important elements of the natural flow regime in the context of a superabundance of flow: Stage 2 – McMahons Creek study.* Retrieved from Melbourne:

Eccleston, C. H. (2006). Applying the Significant Departure Principle in Resolving the Cumulative Impact Paradox: Assessing Significance in Areas That Have Sustained Cumulatively Significant Impacts. *Environmental Practice, 8*(4), 241.

Endreny, T. (2008). Naturalizing urban watershed hydrology to mitigate urban heat-island effects. *Hydrological Processes, 22*, 461-463.

Fletcher, T. D., Walsh, C. J., Bos, D., Nemes, V., RossRakesh, S., Prosser, T., . . . Birch, R. (2011). Restoration of stormwater retention capacity at the allotment-scale through a novel economic instrument. *Water Science and Technology, 64.2*, 494–502.

Grey, V., Livesley, S. J., Fletcher, T. D., & Szota, C. (2018). Establishing street trees in stormwater control measures can double tree growth when extended waterlogging is avoided. *Landscape and Urban Planning, 178*, 122-129. doi:https://doi.org/10.1016/j.landurbplan.2018.06.002

Harris, G., Batley, G., Fox, D., Hall, D., Jernakoff, P., Molloy, R., . . . Walker, S. (1996). *Port Phillip Bay Environmental Study - Final Report*. Retrieved from Canberra, Australia.:

Hatt, B. E., Fletcher, T. D., Walsh, C. J., & Taylor, S. L. (2004). The influence of urban density and drainage infrastructure on the concentrations and loads of pollutants in small streams. *Environmental Management, 34*(1), 112–124.

King, R. S., Baker, M. E., Kazyak, P. F., & Weller, D. E. (2010). How novel is too novel? Stream community thresholds at exceptionally low levels of catchment urbanization. *Ecological Applications, 21*(5), 1659–1678. doi:10.1890/10-1357.1

Leopold, L. B. (1968). *Hydrology for urban land planning - a guidebook on the hydrologic effects of urban land use* (554). Retrieved from Washington:

Marsden Jacob Associates. (2007). *The economics of rainwater tanks and alternative water supply options*. Retrieved from Melbourne, Australia:

Melbourne Water. (2017). *Little Stringybark Creek Environmental Significance Overlay: review and future directions*. Retrieved from Melbourne:

Nemes, V., La Nauze, A., Walsh, C. J., Fletcher, T. D., Bos, D., Rossrakesh, S., & Stoneham, G. (2016). Saving a creek one bid at a time: a uniform price auction for urban stormwater retention. *Urban Water Journal, 13*(3), 232–241. doi:10.1080/1573062X.2014.988732

Rossrakesh, S., Walsh, C. J., Fletcher, T. D., Matic, V., Bos, D., & Burns, M. J. (2012). *Ensuring protection of Little Stringybark Creek: evidence for a proposed design standard for new developments.* Retrieved from Melbourne: http://www.urbanstreams.unimelb.edu.au/Docs/LSB_ESO_Technical_report-final.pdf

Rutherfurd, I., Jerie, K., & Marsh, N. (2000). *A rehabilitation manual for Australian streams*. Melbourne, Australia: CRC for Catchment Hydrology.

Walsh, C. J. (2004). Protection of in-stream biota from urban impacts: minimise catchment imperviousness or improve drainage design? *Marine and Freshwater Research, 55*(3), 317–326.

Walsh, C. J., Booth, D. B., Burns, M. J., Fletcher, T. D., Hale, R. L., Hoang, L. N., . . . Wallace, A. (2016). Principles for urban stormwater management to protect stream ecosystems. *Freshwater Science, 35*(1), 398–411. doi:10.1086/685284

Walsh, C. J., Fletcher, T. D., Bos, D. G., & Imberger, S. J. (2015). Restoring a stream through retention of urban stormwater runoff: a catchment-scale experiment in a social-ecological system. *Freshwater Science, 34*(3), 1161–1168. Retrieved from http://www.jstor.org/stable/pdfplus/10.1086/682422.pdf

Walsh, C. J., Fletcher, T. D., & Burns, M. J. (2012). Urban stormwater runoff: a new class of environmental flow problem. *PLoS ONE, 7(9)*, e45814. doi:10.1371/journal.pone.0045814

Walsh, C. J., Fletcher, T. D., & Ladson, A. R. (2005). Stream restoration in urban catchments through re-designing stormwater systems: looking to the catchment to save the stream. *Journal of the North American Benthological Society, 24*(3), 690–705.

Walsh, C. J., Sharpe, A. K., Breen, P. F., & Sonneman, J. A. (2000). Effects of urbanization on streams of the Melbourne region, Victoria, Australia. I. Benthic macroinvertebrate communities. *Freshwater Biology, 46*, 535-551.

Walsh, C. J., & Webb, J. A. (2013). *Predicting stream macroinvertebrate assemblage composition as a function of land use, physiography and climate: a guide for strategic planning for river and water management in the Melbourne Water region.* (13-1). Retrieved from Melbourne:

Zhang, L., Dawes, W. R., & Walker, G. R. (2001). Response of mean annual evapotranspiration to vegetation changes at catchment scale. *Water Resources Research, 37*(3), 701–708.

CITY OF GREATER GEELONG
PO Box 104, Geelong VIC 3220
P: 03 5272 5272
E: contactus@geelongcity.vic.gov.au
www.geelongaustralia.com.au

16 December 2020

Doc No: D20-523706
Our Ref: D20-523706

Ms Sigourney Irvine
EPA Victoria
200 Victoria Street,
CARLTON VIC 3053
urbanstormwaterbpem@epa.vic.gov.au

Dear Sigourney

Re: Draft Urban Stormwater Management Guidance

Thank you for the opportunity to provide feedback on the EPA's draft guidance for urban stormwater management released to industry on 21 October 2020.

We understand the intention behind the draft guidance (Publication 1739) is to provide information that will support the planning and design of new urban stormwater management systems by:

- highlighting the risk to waterways and bays caused by sealed surfaces;
- providing objectives and information to support risk assessment and minimisation; and
- explaining stormwater management for communities in Victoria.

The City and our communities have a strong connection with the environment, and we recognise the important role local government has in stormwater management noting in 2020 we adopted our:

- Sustainability Framework 2020 designed to create a culture of sustainable practice in our organisation that will help us address significant future challenges, such as climate change;
- Environment Strategy 2020-2030 detailing sustainability goals and how we will act to protect our region's environment and reduce our environmental footprint; and
- Stormwater Services Strategy 2020-2030 outlines a 10-year approach to reduce dangerous flooding and stormwater pollution.

The City commends the effort required to develop regulatory reforms of this nature, and enclosed feedback for your consideration. We would welcome further opportunity to provide input into revision of the guidance and/or its implementation.

Yours sincerely

JUSTIN HINCH
COORDINATOR INFRASTRUCTURE PLANNING

ENGINEERING SERVICES

TELEPHONE (03) 5272 6164
InfrastructurePlanning@geelongcity.vic.gov.au

Attach: Feedback Summary

Draft urban stormwater management guidance review

Summary

The attached comments and recommendations are provided for consideration in preparing amendments to the guidance material.

Areas of Support

- The removal of the 1.5% ARI discharge objective, given this typically applied inconsistently due to the difficulty in calculating this value, as well as lack of a standardised methodology / tools.

- Introduction of objectives relating to flow volumes fills a key gap in the existing framework as it relates to flow impacts on receiving waters. The existing framework for determining appropriate flow volumes is largely based around peak flows, which is a flooding / drainage capacity issue and does not take into account the impact of additional water volumes on the ecological function of rivers, creeks and other natural water bodies (e.g. through changes to hydrological regimes, cold water flushes, dilution of saltwater lagoons etc.).

Improvement Opportunities

- The guidance is explicitly not a compliance framework and expect that the main tool for implementation of the guidelines will be through the Victoria Planning Provisions, given the “existing” BPEM stormwater management objectives are already embedded within several planning scheme provisions. It is not considered enough coverage to rely on the planning approvals process as the primary mechanism through which stormwater management is reviewed, assessed and controlled.

    - Given the potential spatial impacts of the flow reduction targets (particularly when at the higher end) integration with the planning system is critical to ensure that where land is required to be set aside for larger wetlands, recycled water plans, stormwater harvesting infrastructure etc, this can be integrated with wider urban form rather than “tacked on”.

    - It is unclear as to how the guidance can be implemented in areas where there are existing structure plans already set expectations as to yield, development layout, land take for asset footprints, and infrastructure funding.

    - Consideration needs to be made as to whether any new requirements within the planning system to implement the new guidelines will be transitional or not (e.g. will there be provision for older approvals to only meet the previous guidelines). Depending on the flow reduction target, considerable rework could be required not only of the approved spatial layout for future development of these areas, but also development costing and infrastructure funding arrangements where catchment/sub-catchment scale (e.g. not site specific) infrastructure is required and no one developer can be burdened with the cost.

    - It is strongly recommended that the guidance refers to how areas where this could be an issue are to be identified well in advance of any planning scheme changes to determine the potential impacts and changes required, so as to avoid this being done “on the run” through individual development approvals.

    - A significant amount of development approvals occurs for infill residential, and it appears that there will be no real material difference in the treatments required to meet the 25% flow reduction than are already required under the current planning scheme controls. It is not clear what the implications will be from the higher flow reduction target on this development type. These types of development typically have limited design options to meet requirements, with

"deemed to comply" solutions likely to be the most practical mechanism to achieve meaningful compliance.

- Applications for many smaller developments are often managed directly by the project architect/planner, who rely heavily on simple tools such as STORM to calculate compliance with the current stormwater requirements. Implementation of the new guidelines must take this user base into account, as the majority will not be familiar with engineering calculations or software.

- As the guidance appears to imply expectation on the planning authority (LGA) to develop and implement guidelines for design and assessment of development response to the standard, it is recommended that the guidance be more explicit in nominating who will / should / must develop which of the necessary suite of implementation tools (e.g. waterway protection prioritisation tool).

    - Another implied expectation appears to be that each LGA will have a pre-determined and well-understood network of "priority waterways" in order to assign and communicate catchment quality / quantity discharge requirements. Without a scientifically sound and regionally consistent basis to defend a higher range flow reduction, a basic standard will emerge as the lowest option in the range available and will apply to all development. Depending on what type of ecosystem is expected to receive the most substantial protection, it is assumed environments like Ramsar wetlands would trigger higher-end volume reduction.

    - The guideline mentions that "a transparent process is required to identify priority areas for enhanced stormwater management outside the greater Melbourne area". What is the state of knowledge for waterways in regional Victoria at most risk from urban development, and what institutional / funding arrangements are required to ensure that this work can be done within a reasonable timeframe of the guidelines taking effect and/or their implementation through the planning system? It is recommended that guidance on how to determine low / med / high value receiving waterways is included.

    - If LGAs and/or CMAs are expected to develop the guidelines and specifications required to compliment and implement this guidance, then dedicated resources will be required to respond and would suggest EPA would need to facilitate training and support to achieve this.

- While the City supports the introduction of flow standards, it is expected that introduction of a target range (e.g. 50-90%) will be ineffective in driving the desired outcomes.

    - Developers will choose the lowest option of the range, which can be mitigated by setting a minimum standard.

    - A target range will prove extremely difficult in practice without clear performance objectives.

    - There is a strong metro-focus in the guidance and identifies those areas subject to the higher flow reduction target based on the analysis undertaken in Melbourne Water's Healthy Waterways Strategy. However, as a regional city Geelong is also subject to growth pressures. EPA is encouraged to provide support to implementation the guidance across regional areas.

- Use of "reasonably practicable" generate significant opposition amongst practitioners and expected to be ineffective in practice. The City strongly recommends that reasonably practicable is reconsidered and a clear compliance and authorising environment reinforces the flow standards when released to industry.

EPA Victoria

response to EPA releases the draft urban stormwater management guidance for feedback

C/- Sigourney.Irvine@epa.vic.gov.au

To whom it may concern

OneWater Naturally P/L(OneWater) is pleased to submit a brief analysis of the developed documents 1829, 1739 and 1919 provided to inform industry feedback in Stormwater Management. OneWater has 20 plus years as a product solutions supplier for rainwater harvesting, stormwater water quality improvement and small scale AWTS sewage management and concepts for decentralised wastewater treatment solutions as a holistic approach in support of water cycle flows. Subsequently OneWater has developed robust IoT device driven solutions for data monitoring, analysis and rules based alert for water quality compliance, water balance algorithms, behind-the-meter water and energy management for conservation, utilisation of alternate water sources and utility demand and critical infrastructure always-on operation for water resource management. This approach is driven by simplified remote access, edge networks as low cost integrated water solutions.

OneWater has a background with many years of participation in industry associations including Rainwater Harvesting Association and Stormwater NSW that hasn't had the recognition of the approach and solutions industry bodies contribute that appears to be at a turning point with such initiative of Victoria EPA which is applauded.

OneWater provided feedback to the Victorian Government's Yarra River study as a water application and where this response continues on the theme adopted there. OneWater would like to contribute and collaborate particularly with WSAA led IoT W-Labs initiative however OneWater has not had the privilege of any responses to our collaboration offers that questions the value of our work in such feedback that it is hope would be advanced for this important work.

It is interesting to read the Stormwater Science report 1919 which effectively begins at Page 16 'update since 2013/14' and quite reasonably reports on research and analysis. The association with the additional reports mentioned here particularly the 1739 document looks on face value to undermine and trivialise the tenants and findings of the 1919 report when applied especially with the scenario put forward as suitable developer solutions to the obligations in new developments and infrastructure. It is understood that the 1739 is intended for developers!

OneWater Naturally P/L. submission to : Draft urban stormwater management guidance

I look at the premise of the guideline development taking account of the Stormwater Science report 1919 which surely needs to be used as the foundation of the guide development with a whole of urban catchment outlook and have account of the acknowledged waterways harm of degraded river ecology and human health risk that has some contribution from site issues however the majority of water in the catchment is from surface water and its run-off!

Science shows that even at low levels of urbanisation our rivers, bays and estuaries are harmed. As Victoria develops, the extent of these sealed surfaces increases, which in turn increases the volume of runoff and pollutants entering waterways. This not only gives rise to the risk of harm to waterway health (degraded river ecology, erosion, reduced amenity), but also presents potential risks to human health where people come into contact with waters receiving stormwater runoff.

Therefore, it is important to manage stormwater to:

- reduce pollutant loads
- protect the values of aquatic ecosystems
- reduce the risk to human health and the environment
- protect potential alternative water supply sources.

Why EPA is developing new urban stormwater guidance

Since the 1999 BPEM was published, knowledge about the harmful effects of urban stormwater, particularly the harm associated with stormwater flows, has significantly expanded. The current objectives do not adequately cover flows, and science tells us that how we manage stormwater today will not protect our waterways as urban development and population growth continues.

An objective to maintain discharges for the 1.5-year Average Recurrence Interval ARI at pre- development levels has been ineffective, due to its vagueness, absence of a tool for designers to assess, and the potential for environmentally damaging outcomes if volume of flows is not also reduced.

The potential solutions for developers appear to be directed to housing site lots.

- It cannot be seen where any relationship has been applied to the 1919 report as a science based guidance that developers will be grateful in having such weak guidance! If this guidance became the normalised approach there is no benefit to water authorities in demand mitigation, flood avoidances or infrastructure benefit or more importantly Natures ecology.
- The misplaced reference to volume of flows is also questioned in the manner set-out.
- The roof capture is not stormwater flows but is a well-considered rainwater harvesting proposal albeit totally inadequate proposal for rainwater tank storage capacities. The diagrams representing suitable compliance measures as building blocks consumed by impervious surfaces could be misrepresentative.
- This guidance will not contribute to climate change response as no practical hydration of the ground can be achieved as set out in 1739 and no mitigation of catchment flows is considered in such scenarios.

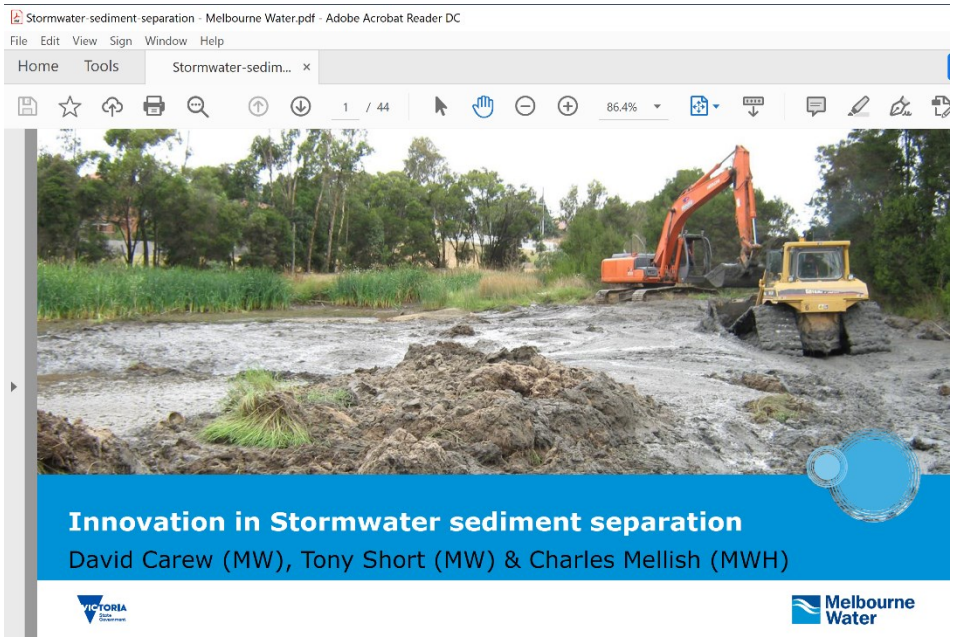
The value of such an approach in support of developers would be better from not being advocated as the scope and objectives are not met. If this were to be published developers would have a free reign to avoid any relevant WSUD development where WSUD is properly defined.

1.2 Scope

The guidance relates to stormwater runoff from urban areas in Victoria. It addresses key environmental risks associated with generating new impervious surfaces, covering pollutant loads and flow impacts on the environment. While it covers a range of environmental risks, it provides environmental objectives for only a subset of these risks.

It does not provide guidance for those parties responsible for the ongoing management and operation of stormwater management systems, or temporary environmental management systems used during the construction phase, or mobile business activities. Information on temporary systems is provided in other EPA guidance and guidance on maintenance by water corporations and some councils.

Stormwater as any water not collected from clean generally roof catchments and as water that has reached and touched the ground is being confused with harvested roof water. Stormwater run-off has not been specified as site run-off but stormwater is about urban catchments and the water flows that travel through that catchment as a part of the water cycle!



This is exactly the consideration and cost identified in the Melbourne Water report showing the consequences of developers 'Reasonably Practical' approach to stormwater water quality improvement for developers WSUD wetland approach already dotted all the way across Victoria's urban development passed on to local authorities to maintain for life.

To begin to build an effective stormwater treatment and management solution a catchment wide approach is the first consideration. WSUD is not a proper premise for such a solutions based approach as water quality improvements and flow mitigations must be achieved ahead of WSUD. WSUD is a final tertiary treatment process where nature is appropriately involved for Hydraulic Residence (HRT) where biological nurturing and flow throttling can occur. With the settlement of the water body additional TSS settlement may take place that can also support the nurturing of the ecology to perform their specialist functions with an outcome of healthy waterways that humans can take advantage of for amenity like recreation and sustainability of water sources.

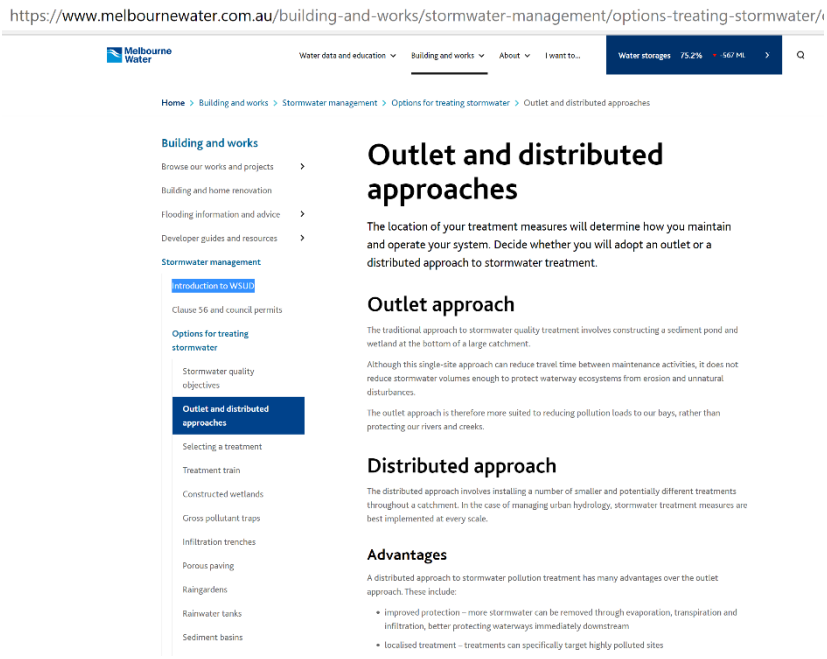
The 1919 report refers to “receiving waters for the proposed contaminate reductions which aligns with OneWater’s conceptual micro distributed catchment model (MDCM) and as advocated water quality improvement and flow rate reductions should be undertaken ahead of WSUD which are the receiving waters, consistent as set-out below:

Pollutant	Receiving water objective:	Current best practice performance objective:
Post construction phase:		
Suspended solids (SS)	comply with SEPP (e.g. not exceed the 90th percentile of 80 mg/L) (1)	80% retention of the typical urban annual load
Total phosphorus (TP)	comply with SEPP (e.g. base flow concentration not to exceed 0.08 mg/L) (2)	45% retention of the typical urban annual load
Total nitrogen (TN)	comply with SEPP (e.g. base flow concentration not to exceed 0.9 mg/L) (2)	45% retention of the typical urban annual load
Litter	comply with SEPP (e.g. No litter in waterways) (1)	70% reduction of typical urban annual load (3)
Flows	Maintain flows at pre-urbanisation levels	Maintain discharges for the 1.5 year ARI at pre-development levels
Construction phase:		
Suspended solids	comply with SEPP	Effective treatment of 90% of daily run-off events (e.g. <4 months ARI). Effective treatment equates to a 50%ile SS concentration of 50 mg/L.
Litter	comply with SEPP (e.g. No litter in waterways) (1)	Prevent litter from entering the stormwater system.
Other pollutants	comply with SEPP	Limit the application, generation and migration of toxic substances to the maximum extent practicable

1 An example using SEPP (Waters of Victoria 1988), general surface waters segment.
2 SEPP Schedule F7—Yarra Catchment—urban waterways for the Yarra River main stream.
3 Litter is defined as anthropogenic material larger than five millimetres.

Figure 1. BPEM Targets (CSIRO, 1999)

Flow is a readily managed in innovation for MDCM network system as proposed by OneWater years ago and has since been considered by Melbourne Water.



Please see the attached concept document outlining MDCM.

The OneWater concept of MDCM operates in two modes. Essentially commencing the capture and treatment at source with first flush to substantially lower the contaminate load where the rainwater falls. The second mode is dividing the flows to reduce velocity and volume of the water

flows carrying the high contaminate load that require normalised contaminate reduction more costly treatment. The flows are divided into high flow low contaminate flows approximately 2/3 of total flow through a device that is often suitable for direct flows into WSUD like storage or wetland for HRT or with finer filtration device for soluble contaminates including nutrients plus hydrocarbons and persistent TSS before release if needed relative to a type of place-based consideration. The first flush system is patented leading into the treatment train capable of exceeding the guide quantitive contaminate load reductions. This is contrasted with eh expensive and limited performance of GPT's that fail in soluble contaminate reductions so critical to waterway release and protection of Natures' ecology. This is the application of Stormwater Science applied in product solutions for effective water quality improvement that can then be harvested and safely released into waterways providing the health of ecosystems and amenity for Human lifestyle and sustainability.

1 Purpose

Uncontrolled urban stormwater runoff poses a risk to the values of waterways and bays. This guide is intended to help improve the management of urban stormwater in Victoria by recognising current science and the risk of harm from urban stormwater flows. It supports minimising the risk of harm to human health and the environment through good environmental practice and provides information that will support the planning and design of new urban stormwater management systems.

1.1 How to use this guide

You can use this guide to help minimise risks from urban stormwater so far as reasonably practicable. Doing what is reasonably practicable means putting in proportionate controls to minimise the risk of harm to human health and the environment. Reasonably practicable also considers what controls are available and their cost, and considers what an industry generally knows about the risk and control options. The approach and steps you take to do this will also depend on the scale and complexity of your project, the receiving environments, and the nature of the risks you need to manage.

Table 1: Quantitative performance objectives for urban stormwater

Indicator	Performance objective
Suspended solids	80% reduction in mean annual load (Note:1, 2, 6)
Total phosphorus	45% reduction in mean annual load (Note:1, 2, 6)
Total nitrogen	45% reduction in mean annual load (Note:1, 2, 6)
Baseflow contribution	10% of mean annual rainfall volume to contribute to baseflow (Note: 2, 4, 5)
Flow reduction	50 – 90% reduction in mean annual total runoff volume in priority areas for enhanced stormwater management (Note: 2, 3, 7)
Flow reduction	25% reduction in mean annual total runoff volume in areas that have not been identified as priority areas for enhanced stormwater management (Note: 2, 3)
Litter	70% reduction of mean annual load

Another management approach is to use offsets. Melbourne Water has applied these primarily in relation to nitrogen, with the aim of applying stormwater management actions at the least cost.

Key elements of the draft guidance[1]

Who the guide is for

The draft guidance is intended for developers who generate new impervious surfaces, such as roads, in subdivisions and other developments. It is also relevant to other parties who inform infrastructure planning and design, including technical consultants.

Currently a review of Melbourne Urban Stormwater Institutional Arrangements is underway related to roles and responsibilities for the operation and maintenance of stormwater assets.
https://www.water.vic.gov.au/liveable/stormwater-review

Proposed objectives[2]

The draft guidance introduces quantitative flow reduction objectives:

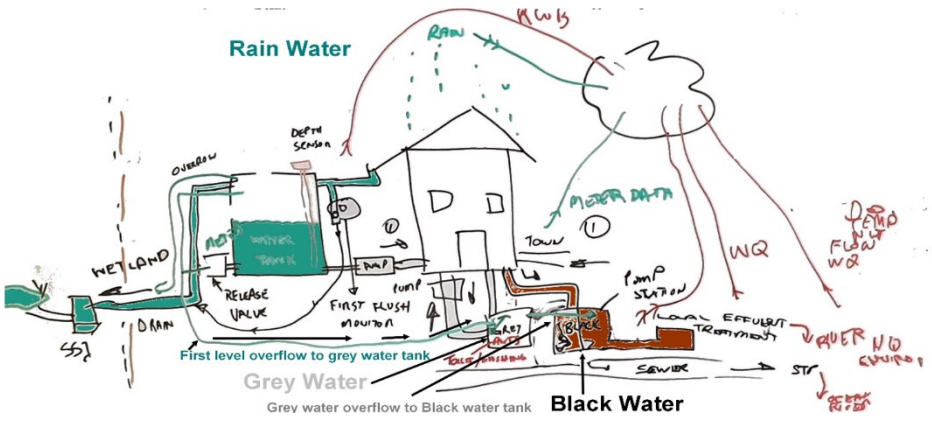
- 50 to 90 per cent flow reduction in mean annual total runoff volume in priority areas for enhanced stormwater management[6]
- 25 per cent flow reduction in mean annual total runoff volume in all other areas.
- Baseflow contribution – 10 per cent of mean annual rainfall volume to contribute to baseflow.

The draft guidance maintains the existing BPEM pollutant reduction objectives:

- Suspended solids – 80 per cent reduction in mean annual load.
- Total phosphorus – 45 per cent reduction in mean annual load.
- Total nitrogen – 45 per cent reduction in mean annual load.
- Litter – 70 per cent reduction of mean annual load.

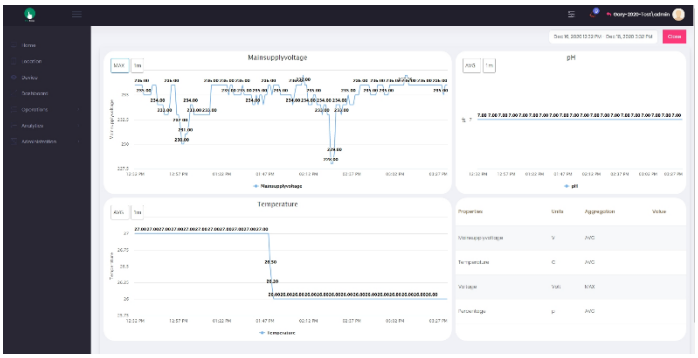
OneWater consider that for site arrangements the NSW Basix legislation has been very effective and successful policy for onsite water management and is non-prescriptive. Water as well as energy reduction of 50% reduction in water demand has been achieved over 12 years of operation. This is recommended for consideration.

For onsite water run-off the OSD designs are quite effective for site application especially with integrated IoT solutions where the whole of site water usage and discharge is taken into account. Wastewater discharge is also an important consideration to reduce the water balance of any sight that can be easily achieve integrated with IoT and edge networks for low pressure sewerage solutions readily available. This integrate OneWater refer to as Water In Water Out (WiWo) when the maximum use of available on-site water is utilised and managed for discharge from site that can be expanded upon. The most relevant part of the policy development is the Stormwater Science followed by the target contaminate reductions and flow minimisation effects in my view.



[1] 1829 page 13
[2] 1829 page 13

The current method to implement the complexity, the integration and catchment wide water balance view is through IoT 4.0 for device driven real-time and time sequenced data collections. OneWater has developed a public Cloud platform with the necessary hardware and algorithms that step ahead of the current approaches and individual analysis. This platform capability is at www.onesense.com.au as an outline of a set of capabilities for future cities and managing effective climate change response for water and Natures ecology.



The next step is to device solutions to the Stormwater Science. OneWater has a whitepaper detailing the MDCM aggregated contaminate reductions that could be applied to place-based solutions for information. The 1919 report is a very relevant outlook where product supplier can update and apply to their designed for improved water quality outcomes in the treatment train. However the concrete box product suppliers that generally monopolise the market in heavy engineering project based approach have not adequately solved the issues of stormwater water quality for an appropriate degree and it is questioned when considered with the high maintenance required and the safety of maintenance operations that a fresh look is needed before the stormwater responses are of the value needed for climate change responses and for future city developments.

It is my submission that stormwater management for water quality improvement and environmental protection needs to step up and that should not allow for the sentiments that developers should be absolved from a comprehensive solution from the demand of a small cost of sustainability and environmental protection given developers include domestic site development, roads, infrastructure, treatment plants that take account of stormwater science and water that is then channelled into WSUD development that nurtures and protects nature and its critical ecology on which we rely so often.

OneWater Naturally P/L. submission to : Draft urban stormwater management guidance

Review of stormwater science

Prepared for: EPA Victoria

Publication 1919 October 2020

Executive summary excerpt

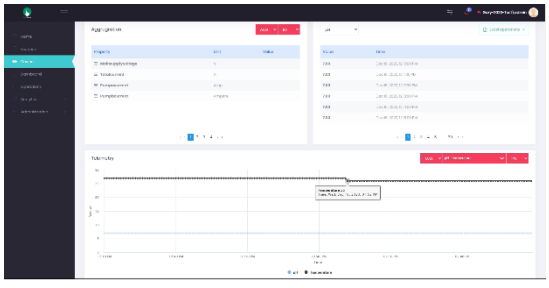
Principals	Stormwater Science Issues	OneWater response
Waterway values and place-based objectives	In 2013 the Healthy Waterways Strategy (Melbourne Water, 2013) defined objectives for waterway values including Birds, Fish, Frogs, Macroinvertebrates, Platypus, Vegetation and Amenity (that is Recreation and the low risk of harm when used)	Natures ecology upon whom human activity relies must be nurtured and protected. Nature has infinite processes and pathways that deliver reliable results from essentially micro processes that humans attempt to replicate in sub-optimal macro process that still ends up in waterways to effect natures ecology when we most need Nature to perform at the time of peak storms. The solutions for stormwater water quality and management must be significantly improved with new thinking with Nature as the foundation of effective and harmonising design.
Place based objectives	Social, ecological and economic values are location specific and require tailored responses to ensure their values are protected. The Draft Healthy Waterways Strategy (2018) sets place-based objectives for waterway values as well as location specific targets for stormwater harvesting and infiltration. In this sense there is a general appreciation that place based objectives represent an improved ideal approach, compared with uniform targets. Further, Action 5.5 of the Department of Environment, Land, Water and Planning's Water for Victoria document (2016) that includes Action 5.5. to "Improve stormwater management for greener environments" by "leading the development of local place-based targets for stormwater management". The review of the literature identifies local and international examples where scientific approaches have led to the successful protection of individual values. There is however greater complexity associated with the development of objectives and targets for the protection of multiple values. A lack of data is also identified as a potential barrier to objective setting in some cases.	Harmonising with Nature embraces social and ecological values. The economic value are often misplaced using Nature as a no cost option for waste and expedience, being out of sight and out of mind that must change Place based objectives maybe no more than utilising beneficial economic factors to mitigate costs. The water cycle is not place-based but the human and economic needs may well be. The terms harvesting and infiltration are no more than ideological in the present approach. Harvesting has traditionally been in competition with water authorities billing schemes with little commitment to harvesting for water as a resource at the local level. IoT is the next step for water quality improvements and sustainability with real-time data for autonomous operation of well designed 'Proof of Concept' to replace water models that are not reflective of real world demand requirements

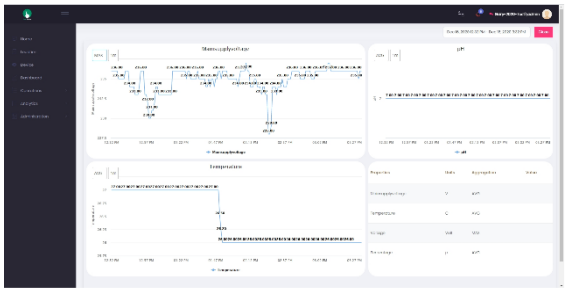
Flow	The flow related regulation within the BPEM is to maintain discharges for the 1.5- year ARI at pre-development levels. Flow is a critical threat to urban waterway values and evidence to support this continues to grow. There are numerous indicators that can reflect the impact of flow, with 'total annual runoff volume' identified as being a functional indicator, given its correlation with stream health. Protecting or restoring values in an urbanised catchment may require something in the order of 50-90% reduction in total annual runoff volume., with stormwater harvesting, reuse and infiltration a key contributor to reaching such a target. There is limited information on whether lesser percentage reductions are suitable where protecting pre-development values is not the objective	What is the point of considering Science based approach with these parameters? Science might say that stronger flows probably increase the carriage of contaminate loads of all types. Flow velocity does not allow for suspended material to be released including for vegetated devices interrupting flows ! The real water quality improvements occur in low velocity and smaller segmented catchments so that contaminate loads are not transferred and otherwise contaminate the whole of the catchments with the traditional 'OUTLET' model of stormwater treatment. **OneWater advocated the micro distributed catchment model (MDCM) for stormwater treatment train and flow separation mode of treatment giving a significant contaminate reduction throughout the catchment.**
Quality	The literature since the previous review of BPEM suggests that TSS, TP, TN and gross pollutants are important pollutants to remove from urban stormwater, both for protecting the health of receiving waters, and for protecting public health. As well as the annual load, the timing of loads, seasonality of loads and concentrations of pollutants are also important factors and the removal of TSS, TP and TN. The removal of TSS has also been associated with the remove other stormwater contaminants (e.g. heavy metals), however the results of this relationship are variable across sites and conditions. Gaps in understanding include a clear assessment of the impact of the current BPEM targets on waterway and public health while noting that monitoring capability continues to improve opening up opportunities to better understand the relationship between stormwater quality and waterway values.	No argument here ! The TSS reference is basic however the outcome for removal of other stormwater contaminates is limited if TSS is actually removed to an acceptable level in the water flows !!! TSS will never be adequately removed in devices used for the OUTLET model like GPT's. {Outlet and distributed approaches | Melbourne Water} The MDCM is far more effective and has not contaminated the whole of the catchment as the contaminates flow to the bottom of the catchment or through streams! It is simple to assess waterways and public health with IoT real-time data and an appropriate Proof of Concept as an autonomous algorithm like that produced by www.onesense.com.au
Stormwater management objectives and the performance of urban stormwater treatment measures	Performance data for WSUD assets like biofilters and wetlands has grown since 2013 but remains variable. Biofiltration performance in terms of concentration reduction is variable, with load reductions often driven through volumes loss. Constructed stormwater treatment wetlands also exhibit variable reductions in concentrations of TN and TP with	In my view water quality and catchment protection is achieved in the step ahead of WSUD. This inherent pre-occupation that WSUD is a treatment train is debunked by the Melbourne Water Wetlands Maintenance report of 2016-7. WSUD is advocated in Victoria as developers' wetlands as offsets and

	sedimentation highlighted as an important element of the treatment process. The performance of WSUD systems within smaller catchments is relatively well researched, however there is a gap in understanding regarding the performance of WSUD when applied at the catchment scale. The Little Stringybark Creek project continues to provide valuable data to this point. It is encouraging that the condition, performance and aesthetic of WSUD assets has improved since 2014. Integrated water management, through stormwater harvesting and infiltration and rainwater tanks, are increasingly recognised avenues to the reduction of pollutant loads going to Port Phillip Bay and the restoration of a more natural catchment hydrology. Climate change will influence catchment behaviour and therefore the design and performance of WSUD. There has been a significant shift in the rainfall-runoff relationship in catchments after extended periods of drought, with implications for catchment modelling approaches. In terms of stormwater quality climate change will result in an increase in pollutant export from urban areas due to increased flow from larger events. Other management mechanisms include offsets. Melbourne Water has applied these primarily in relation to nitrogen, with the aim of applying stormwater management actions at least cost. Whilst there has been successful application, some research has identified potential shortcomings where offsets target pollutant loads at the catchment scale while not accounting for local waterway impacts and values.	convenience which is simply the lowest cost of compliance before handover 12 months after construction for all the issues that destroy wetlands. Wetlands are important but principally for HRT as the only benefit I n the treatment train for biological support (if the water flows are significantly contaminate nutrient and TSS reduced) and water storage that has the benefit of nurturing natures ecology before release to streams and larger water bodies. Wetlands are also human amenity for recreation but not as primary or secondary treatment standing at the bottom of a catchment as a cheap OUTLET model compared to monster GPT's. GPT's are past their use by date as ineffective macro approach with bypasses when needed in peak storm events with high maintenance that further degrades their usefulness with the least and marginal water quality improvement largely for gross pollutants and sediments for appearance sake but do not perform for the real contaminate loads that effect natures ecology and are used as water authorities convenient (hidden) waste stream !

Digital solutions that are lower cost of compliance can also be used with a selection of low cost product solutions that are available to the industry regardless of the scale of the project.

OneWater digital solution is managed in a platform that is available for users and stakeholders like regulatory authorities in a robust and diverse application of devices and communications that are secure. The security is an advance on legacy PLC and can be applied to legacy assets with RS485 capability all available in a public cloud for anywhere access.





It would be considered a disappointing outcome to the development of any guidance if a more strident approach was undertaken that doesn't need to add additional costs and will result in economic and environmental benefits that is our responsibility to put in place, now.

This brief response is open for further collaboration and information on practical and digital solutions that make water quality and waterways health a real approach to climate change response needed in this natural resource application. Developers of sites in urban locations or greenfield developments have a low cost and practical contribution with the guidance outlined briefly here in comparison to the minimalist and ineffective guidance otherwise proposed that lefts down progressive ad future city development in a climate challenged way without well directed guidance.

regards

David S.

One Water Pty Ltd.
Mob: +61 427 192 837
Email: david@onewater.com.au

EPA VICTORIA | Environment Protection Authority Victoria

VICTORIA State Government

Draft urban stormwater management guidance

Publication 1739
October 2020

Authorised and published by
Environment Protection Authority Victoria
200 Victoria Street, Carlton VIC 3053
W epa.vic.gov.au | **T** 1300 372 842 (1300 EPA VIC)

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EPA acknowledges Aboriginal people as the first peoples and Traditional custodians of the land and water on which we live, work and depend. We pay respect to Aboriginal Elders past and present.

As Victoria's environmental regulator, we pay respect to how Country has been protected and cared for by Aboriginal people over many tens of thousands of years.

We acknowledge the unique spiritual and cultural significance of land, water and all that is in the environment to Aboriginal people and Traditional custodians. We recognise their continuing connection to, and aspirations for Country.

Disclaimer

The information in this publication is for general guidance only. It does not constitute legal or other professional advice and should not be relied on as a statement of the law. Because it is intended only as a general guide, it may contain generalisations.

You should obtain professional advice if you have any specific concern. EPA has made every reasonable effort to provide current and accurate information, but does not make any guarantees regarding the accuracy, currency or completeness of the information.

Publication 1739

Published October 2020

Contents

1 Purpose

Uncontrolled urban stormwater runoff poses a risk to the values of waterways and bays. This guide is intended to help improve the management of urban stormwater in Victoria by recognising current science and the risk of harm from urban stormwater flows. It supports minimising the risk of harm to human health and the environment through good environmental practice and provides information that will support the planning and design of new urban stormwater management systems. This guide:

- highlights the risk to waterways and bays the creation of sealed (impervious) surfaces causes
- provides general objectives and information to support risk assessment and minimisation
- explains stormwater management for communities in Victoria

This guide is provided for developers who create new impervious surfaces, such as roads, subdivisions and other developments. It is also relevant to those who inform infrastructure planning and design, including technical consultants. It supports these parties to minimise the risks to human health and the environment from their design, planning and development activities, as the General Environmental Duty (GED) [1] requires. It also supports those involved in the assessment of urban stormwater treatment proposals.

Relevant parties include

- the land development industry
- technical consultants advising developers
- 'responsible authorities' as defined in planning legislation, that consider applications for approval of proposed developments, including local government
- public sector entities, including the Victorian Planning Authority, EPA, Melbourne Water, catchment management authorities, the Major Transport Infrastructure Authority and road authorities.

1.1 How to use this guide

You can use this guide to help minimise risks from urban stormwater so far as reasonably practicable. Doing what is reasonably practicable means putting in proportionate controls to minimise the risk of harm to human health and the environment. Reasonably practicable also considers what controls are available and their cost, and considers what an industry generally knows about the risk and control options. The approach and steps you take to do this will also depend on the scale and complexity of your project, the receiving environments, and the nature of the risks you need to manage.

1.2 Scope

The guidance relates to stormwater runoff from urban areas in Victoria. It addresses key environmental risks associated with generating new impervious surfaces, covering pollutant loads and flow impacts on the environment. While it covers a range of environmental risks, it provides environmental objectives for only a subset of these risks.

It does not provide guidance for those parties responsible for the ongoing management and operation of stormwater management systems, or temporary environmental management systems used during the construction phase, or mobile business activities. Information on temporary systems is provided in other EPA guidance and guidance on maintenance by water corporations and some councils.

[1] The *Environment Protection Act 2017*, as amended by the *Environment Protection Amendment Act 2018,* is intended to apply from 1 July 2021. This includes the general environmental duty. 'Minimise' means (a) to eliminate risks of harm to human health and the environment so far as reasonably practicable; and (b) if it is not reasonably practicable to eliminate risks of harm to human health and the environment, to reduce those risks so far as reasonably practicable.

Runoff from rural land is dealt with separately in the *Victorian Rural Drainage Strategy*, which is available from https://www.water.vic.gov.au/water-for-agriculture/rural-drainage/final-strategy.

Urban stormwater can be used as a resource with many benefits for the environment. This guidance does not directly address the maximisation of these benefits, which should be pursued in line with government policy.

1.3 Status

This is not a compliance document. It contributes to the **state of knowledge**[2] — the general body of knowledge about the harm or risks of harm to human health and the environment, including the controls for eliminating or reducing those risks. It is expected that the state of knowledge will improve over time as new knowledge and opportunities to better manage risk are established.

A range of controls apply to stormwater, including under Victoria's planning system[3], and it is your responsibility to ensure your operations comply with all applicable laws. The content of this guidance complements and adds to the state of knowledge established through previous guidance and planning requirements.

[2] See industry guidance: *Supporting you to comply with the general environmental duty* (EPA publication 1741) for information about other kinds of resources that can contribute to your state of knowledge.
[3] This includes Victoria Planning Provisions Clause 53.18 Stormwater management in urban development, 55, 56 and others.

2 Managing urban stormwater risks

This guidance focuses on how to assess stormwater risks and implement associated controls. Its approach is consistent with the risk management framework EPA published (see **Error! Reference source not found.**), with a focus on stages 2 and 3 as is relevant to those planning the development of impervious surfaces.

For information on the hazards associated with uncontrolled urban stormwater land development, see Appendix 1.

Figure 1 – Steps in controlling hazards and risks associated with stormwater

This section provides tools you can consider using to support the assessment and minimisation of the risk of harm. Effective risk management is a continuous and iterative framework. This means considering how the implementation of appropriate controls will reduce the initial risk and what the remaining risk will be, to help determine the need for any further actions.

2.1 Assess risks: factors to consider

Assessing the risks associated with urban stormwater runoff from your site will help you determine the appropriate management controls to design and install.

Consider the following factors to help you understand the risk of harm:

- the general risks from land development as outlined in Appendix 1
- site-specific risks of harm
- any other relevant state of knowledge, including relevant strategies, policies and guidance – for example the CMA/Melbourne Water Healthy Waterways Strategy (or equivalent policy), and place-specific advice from relevant authorities
- the pre-development flow regime
- monitoring and modelling data – including rainfall – to understand stormwater quality and quantity and its potential impact
- the size, scale and location of activities
- potential impacts to sensitive receivers, including aquatic ecosystems
- waterway values, such as those identified in the Environment Reference Standard and relevant regional waterway strategies – this includes ecological, cultural, social and economic values
- controls that are already in place and their effectiveness
- the volume of runoff your site is likely to generate
- the potential presence of pollutants in the runoff your site is likely to generate.

Metrics to assist you to evaluate risk of harm

The following table is an additional tool to assist in evaluating risk of harm. Performance against the objectives in Table 1 can be used as a signal of the level of risk of waterway values being lost or impacted. EPA regards development that does not meet those performance objectives as presenting a high risk of harm. A suitably qualified and experienced professional making an assessment against these objectives enables a better understanding of the risk of harm and the extent of stormwater management that is adequate to support values [in Table 1].

Note that the:

- reduction levels for solids, phosphorous and nitrogen are longstanding and are required to be achieved under other regulatory instruments, such as the Victoria Planning Provisions
- level of stormwater flow reduction to achieve will depend on what is reasonably practicable.

To assess these performance objectives, use an appropriate software tool. For example, the MUSIC (Model for Urban Stormwater Improvement Conceptualisation) can be used for all indicators. The InSite tool also covers all indicators, while the STORM (Stormwater Treatment Objective – Relative Measure) is under review and currently only covers nitrogen indicator. For further information see: www.melbournewater.com.au/planning-and-building/stormwater-management/storm-and-music-tools

Note: The flow performance objective uses the commonly selected indicator of mean total annual runoff. Other indicators and performance objectives may be used to understand risk of harm to values, including direct connected imperviousness (DCI), Melbourne Water's Healthy Waterways Strategy harvesting and infiltration targets etc. as long as they support an equivalent or better risk assessment.

Table 1: Quantitative performance objectives for urban stormwater

Indicator	Performance objective
Suspended solids	80% reduction in mean annual load (Note:1, 2, 6)
Total phosphorus	45% reduction in mean annual load (Note:1, 2, 6)
Total nitrogen	45% reduction in mean annual load (Note:1, 2, 6)
Baseflow contribution	10% of mean annual rainfall volume to contribute to baseflow (Note: 2, 4, 5)
Flow reduction	50 – 90% reduction in mean annual total runoff volume in priority areas for enhanced stormwater management (Note: 2, 3, 7)
Flow reduction	25% reduction in mean annual total runoff volume in areas that have not been identified as priority areas for enhanced stormwater management (Note: 2, 3)
Litter	70% reduction of mean annual load

Notes to table 1:

(1) 'Reduction in mean annual load' refers to the reduction in load discharged from the development with treatment. This is compared to the load that would be discharged without treatment. Load (or pollutant load) means the mass per unit time of an indicator/pollutant.

(2) These are general objectives and, in some cases, a higher or lower percentage of flow reduction objective may be justified based on scientific evidence.

(3) 'Reduction in mean annual total runoff volume' refers to the reduction in runoff volume discharged from the development, with treatment, compared to the runoff volume that would be discharged without treatment (annually).

(4) This performance objective depends on the combined volume of water that infiltrates from pervious areas and treatment systems, and runoff discharged from the development at a low rate (lower than subsurface flows under pre-development conditions), to be 10 per cent of the mean annual rainfall on the development.

(5) The baseflow contribution performance objective may be inapplicable if the site is subject to requirements in an EPA permission directing that stormwater infiltration be minimised, or is subject to an environmental audit statement that restricts stormwater infiltration. Victoria's planning framework includes requirements to identify potentially contaminated

land at the planning scheme preparation/amendment stage and to manage any potential risks, including via EPA's environmental audit system. More information is available on DELWP and EPA websites.

(6) Compliance requirements apply to some types of development regarding these indicators under the *Planning and Environment Act* 1987: see the Victoria Planning Provisions.

(7) These areas are priority areas for enhanced stormwater management, as identified in the Melbourne Water Healthy Waterways Strategy. They have high ecological value waterways. A transparent process is required to identify priority areas for enhanced stormwater management outside the greater Melbourne area.

2.2 Implementing controls

There are many controls that can be implemented to minimise risks from urban stormwater runoff. Before you select a control, consider how you will use it, and its effectiveness. The controls you select should be proportionate to the risk.

Before you put controls in place, consider your approach to planning and site management. For example:

- Does your site layout help or hinder your control of hazards and risks from stormwater runoff?
- Do your business processes, systems and activities help you prevent harm?

The hierarchy of controls can be used to support the identification and selection of controls by providing a prioritisation framework (Figure 2).

Figure 2: Hierarchy of controlling hazards and risks.

Preventing harm from urban stormwater by minimising pollutants and increased flows involves:

- eliminating specific impervious surfaces where ~~reasonably practicable~~. For example, use of porous pavement
- capturing stormwater runoff
- eliminating or reducing pollutants such as nutrients, sediment, heavy metals and other toxicants found in stormwater
- ~~infiltrating a portion of stormwater runoff.~~

Consider the ongoing management requirements to control stormwater risks and try to choose interventions that do not rely on administrative controls to be effective. Controls need to be fit for purpose and installed and maintained correctly, so also consider the information required to support future maintenance and management.

examples of WSUD

Some examples of stormwater treatments that may be used to minimise risk of harm from urban stormwater runoff include:

- wetlands
- rainwater tanks
- stormwater harvesting
- swales and raingardens
- other water-sensitive urban design features.

Other engineering solutions to adequately capture sediment loads from your site may involve the installation of primary, secondary or tertiary treatment controls listed below. The implementation of the controls should be based on site-specific hazards and the level of risk at the site. A sequence of controls, commonly referred to as a 'treatment train', may be needed if pollutants such as nutrients and fine sediment are encountered:

- **Primary treatment controls** include physical screening of sediment in grassed swales, sediment basins, sediment ponds and litter traps.
- **Secondary treatment controls** consist of fine particle sedimentation and filtration in swales, infiltration trenches, filter bags and porous paving.
- **Tertiary treatment controls** include removal of nutrients and dissolved heavy metals in wetlands and bio-retention systems.

See Section 3 for indicative stormwater treatment examples. As each site is different, an appropriate system to minimise risk of harm may differ for the relevant site, based on any relevant policy or authority's advice. Depending on the scale, this may require developers to engage early with relevant water corporations, planning authorities, catchment management authorities and local councils to identify waterway values. Based on this, a developer would develop appropriate risk management strategies as part of the planning process. Water corporations may have more information on appropriate treatment options relevant to your development site. We recommend that you engage with Melbourne Water in the Port Phillip and Western Port Region for further advice on Healthy Waterways Strategy priority areas.

The design of controls should also consider any risks of the control itself, and options to eliminate or reduce these at the design stage. For example, considering the need to treat sediments for trapped contaminants or limit plant growth to maintain efficient wetland functioning.

In addition to designing and installing an appropriate stormwater management system, it is also important that appropriate controls are implemented during the construction phase to prevent industrial and commercial chemical pollutants and other toxicants entering stormwater. It may also be necessary to manage erosion and sediment from the site. The following EPA publications and resources may be used to inform appropriate controls to implement at the development site and may be useful references for assessing or preparing a permit application:

- *Liquid storage and handling guidelines* (publication 1698, June 2018)
- *Solid storage and handling guidelines* (publication 1730, July 2019)
- *Construction - guide to preventing harm to people and the environment* (publication 1820, October 2020)
- Erosion and sediment advice for businesses
- *Doing it right on subdivisions: Temporary environmental protection measures for subdivision construction sites* (publication 960)
- *Environmental guidelines for major construction sites* (publication 480)

Note: EPA publications 480 and 960 are under review and new guidance is being developed.

3 Indicative stormwater treatment scenarios

Scenario 1: 25 per cent flow reduction.

Development type: residential development, greenfield subdivision

Stormwater Treatment Scenario: 25% Flow Reduction

Development type: residential development greenfield subdivision

Objectives

25% flow reduction achieved with treatment

Stormwater pollutant load reductions achieved with treatment

What needs to be done?

- 60% of every lot's roof area is connected to a 2.5 kL rainwater tank for non-drinking water uses.
- All of the precinct's runoff is treated by a constructed wetland sized at 3.8% of the development area.

Urban form

A residential development is constructed as part of a greenfield subdivision.

Water context

The new greenfield subdivision generates increased stormwater flows that can damage local waterways. Capturing and using stormwater will protect your local waterway and enhance the blue and green elements of your development.

Property owners

New property owners would like to live in an attractive low maintenance environment. Owners reduce water bills with the rainwater tank.

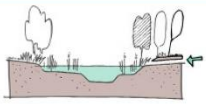
Did you know..

Constructed wetlands are usually used close to a catchment outlet or within a reserve where there is plenty of space. They are best built in land subject to flooding, but outside the main waterway channel. Many developers and councils prefer wetlands because they are reliable and provide amenity for the community.

Rainfall

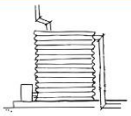
Results based on average Melbourne rainfall. Treatment sizing and costs vary with rainfall in other regions.

1 Wetland



All of the precinct's stormwater runoff is treated with a constructed wetland. The stormwater is filtered by physical and biological processes through a series of shallow, densely-planted areas. The treated water is released to the local waterway.

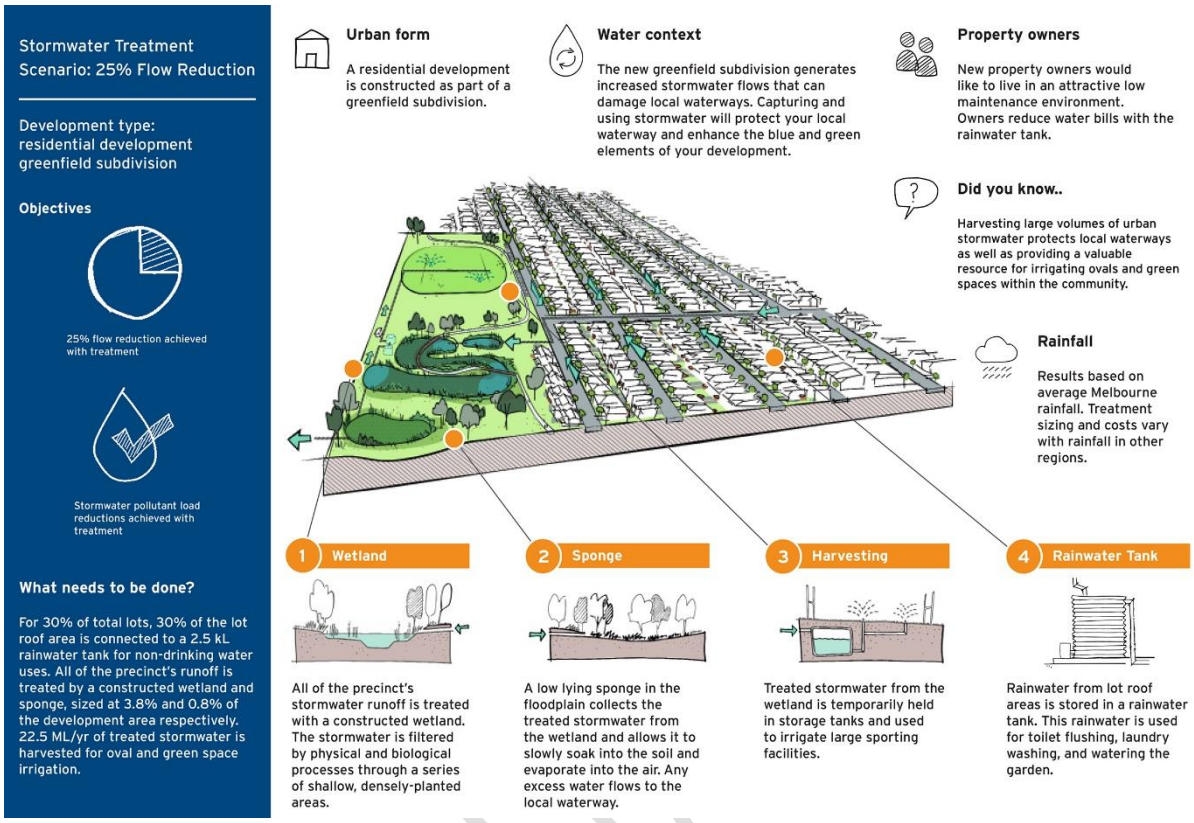
2 Rainwater Tank



Rainwater from each lot's roof area is stored in a rainwater tank. This rainwater is used for toilet flushing, laundry washing, and watering the garden.

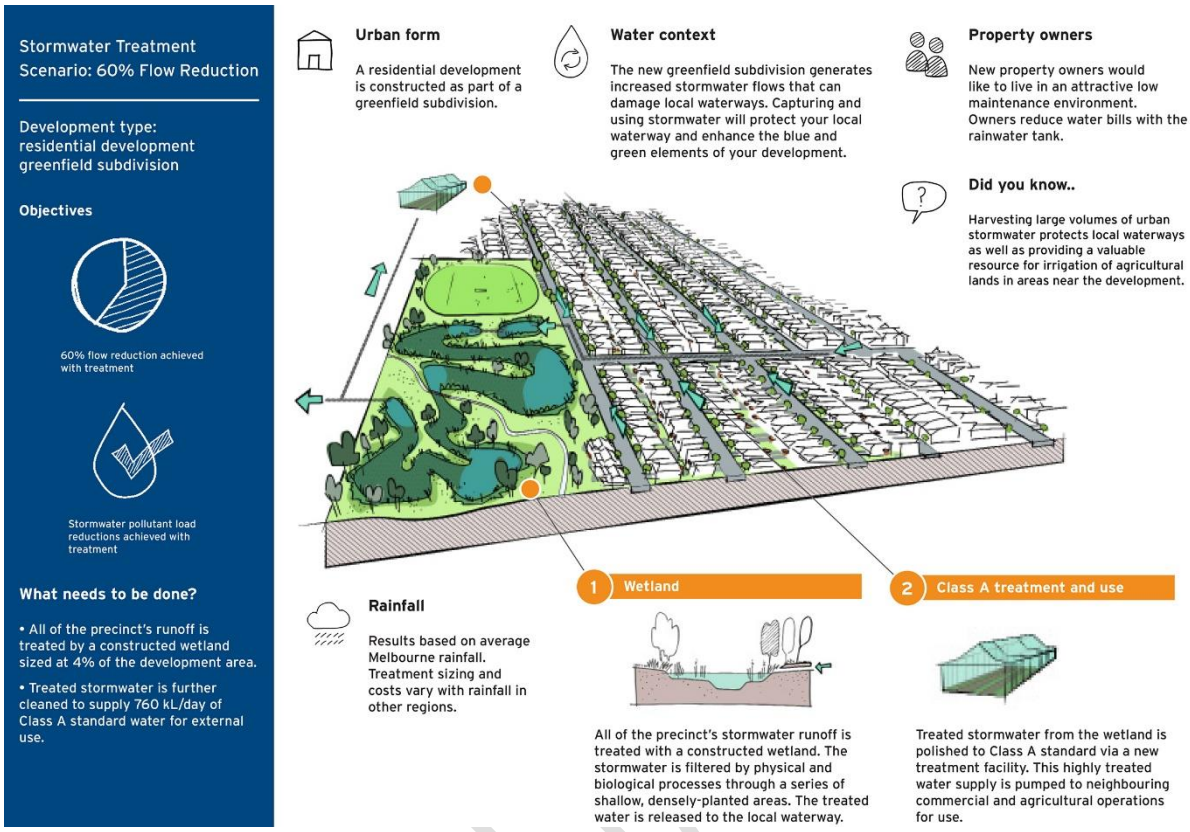
Scenario 2: 25 per cent flow reduction.

Development type: residential development, greenfield subdivision.



Scenario 3: 60 per cent flow reduction.

Development type: residential development, greenfield subdivision.



Scenario 4: 60 per cent flow reduction.

Development type: residential development, greenfield subdivision.

Stormwater Treatment
Scenario: 60% Flow Reduction

Development type:
residential development
greenfield subdivision

Objectives

60% flow reduction achieved with treatment

Stormwater pollutant load reductions achieved with treatment

What needs to be done?

- 100% of every lot's roof area is connected to a 4 kL 'leaky' rainwater tank for non-drinking water uses. The top 33% of the rainwater tank's volume leaks to the lot's garden area.
- All of the precinct's runoff is treated by a constructed wetland sized at 3.5% of the development area. 30 ML/yr of treated stormwater is harvested for oval and green space irrigation.

Urban form

A residential development is constructed as part of a greenfield subdivision.

Rainfall

Results based on average Melbourne rainfall. Treatment sizing and costs vary with rainfall in other regions.

Water context

The new greenfield subdivision generates increased stormwater flows that can damage local waterways. Capturing and using stormwater will protect your local waterway and enhance the blue and green elements of your development.

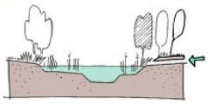
Property owners

New property owners would like to live in an attractive low maintenance environment. Owners reduce water bills with the rainwater tank.

Did you know..

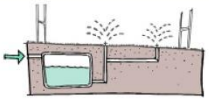
Harvesting large volumes of urban stormwater protects valuable local waterways, provides significant volumes of water for non-drinking uses and contributes to greener, cooler suburbs.

1 Wetland



All of the precinct's stormwater runoff is treated with a constructed wetland. The stormwater is filtered by physical and biological processes through a series of shallow, densely-planted areas. The treated water is released to the local waterway.

2 Stormwater Harvesting



Treated stormwater from the wetland is temporarily held in storage tanks and used to irrigate large sporting facilities.

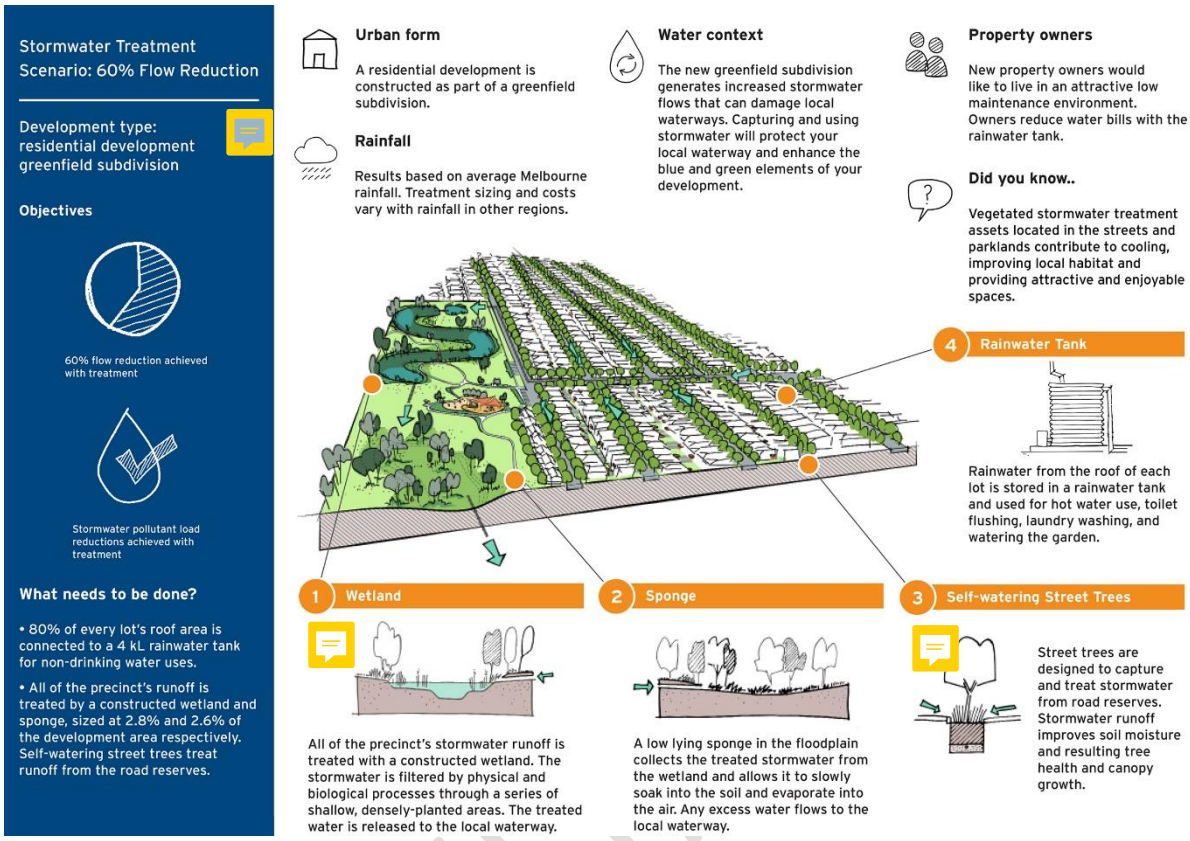
3 Leaky Rainwater Tank

Rainwater from each lot's roof area is stored in a rainwater tank for hot water use, toilet flushing, laundry washing, and watering the garden.

Each tank is designed to slowly release (or 'leak') a portion of the tank's volume to the garden area. This reduces flood impacts during storms by ensuring there is some capacity available for the next rain event.

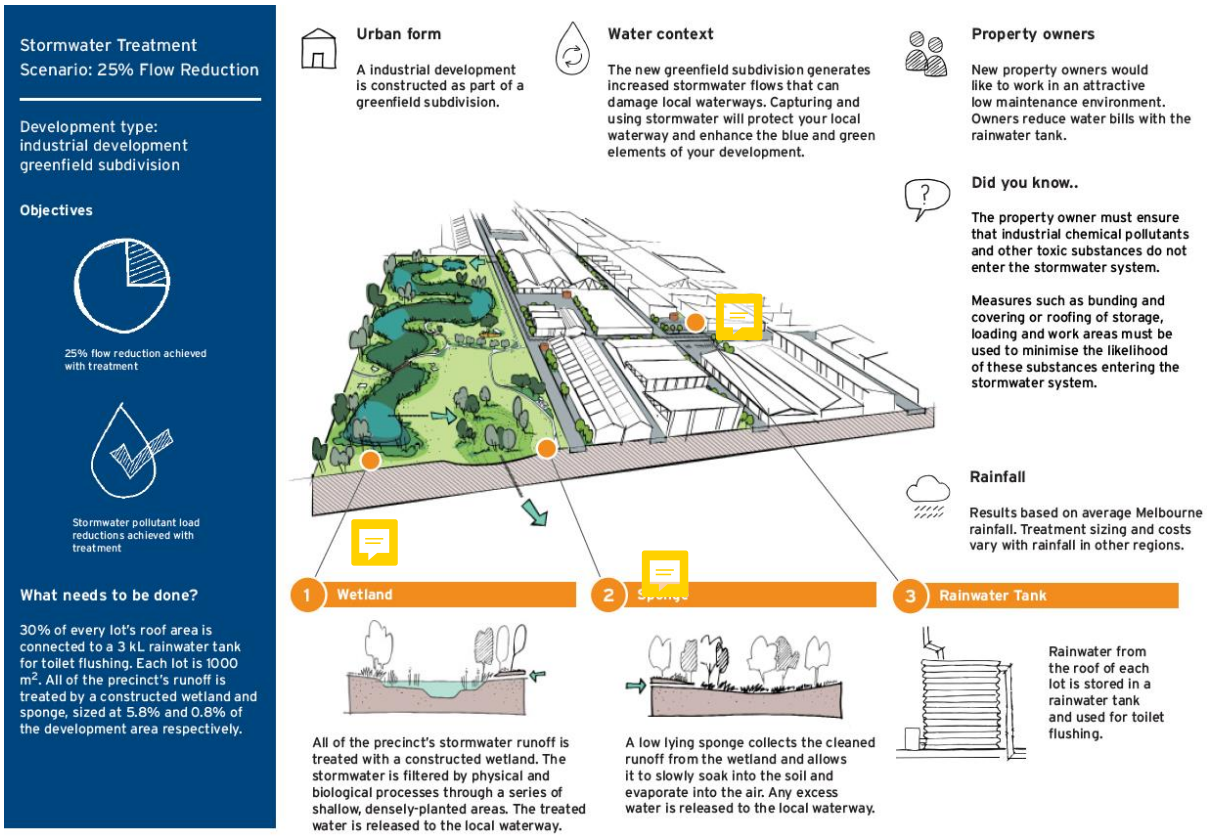
Scenario 5: 60 per cent flow reduction.

Development type: residential development, greenfield subdivision.



Scenario 6: 25 per cent flow reduction.

Development type: industrial development, greenfield subdivision.



Scenario 7: 25 per cent flow reduction.

Development type: townhouse infill multi-dwelling.

Stormwater Treatment
Scenario: 25% Flow Reduction

Development type: townhouse infill multi-dwelling

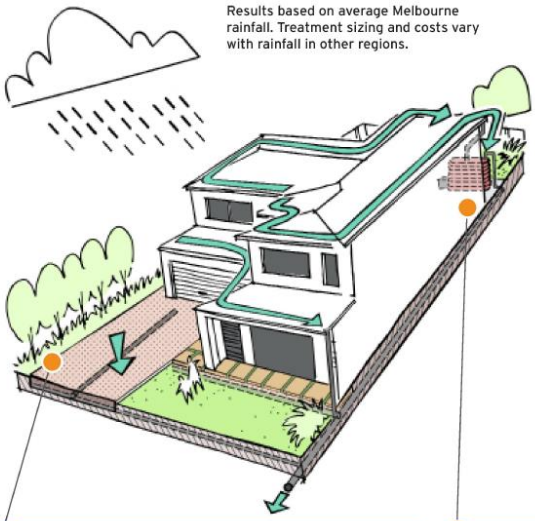
Objectives

25% flow reduction achieved with treatment

Stormwater pollutant load reductions achieved with treatment

What needs to be done?

- 80% of the roof area is connected to a 2 kL rain water tank for non-drinking water uses.
- 100% of paved areas are porous and allow rainwater to soak directly into underlying soils.



Rainfall

Results based on average Melbourne rainfall. Treatment sizing and costs vary with rainfall in other regions.

Urban form

A townhouse is constructed as part of a infill development in an inner urban suburb.

Water context

The new infill development generates increased stormwater flows that can damage local waterways. Capturing and using stormwater will protect your local waterway and enhance the blue and green elements of your development.

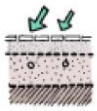
Property owners

New property owners would like to live in an attractive low maintenance environment. Owners reduce water bills with the rainwater tank.

Did you know..

At least 20 per cent of the site should have surfaces that can absorb water – such as garden beds, lawn and other unsealed surfaces (Clause 55.03-4).

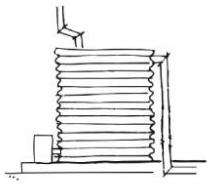
1 Porous Pavement



Rainwater falling on porous pavement used on the driveway, paths and patio soak directly into underlying soils.

This limits the generation of stormwater runoff by allowing some of it to soak into the ground. The rest is slowly collected by an underdrain and is released to the local waterway via drains in the street.

2 Rainwater Tank



Rainwater from the roof of each lot is stored in a rainwater tank and used for toilet flushing, laundry washing, and watering the garden.

Scenario 8: 25 per cent flow reduction.

Development type: townhouse infill multi-dwelling.

Stormwater Treatment
Scenario: 25% Flow Reduction

Development type: townhouse infill multi-dwelling

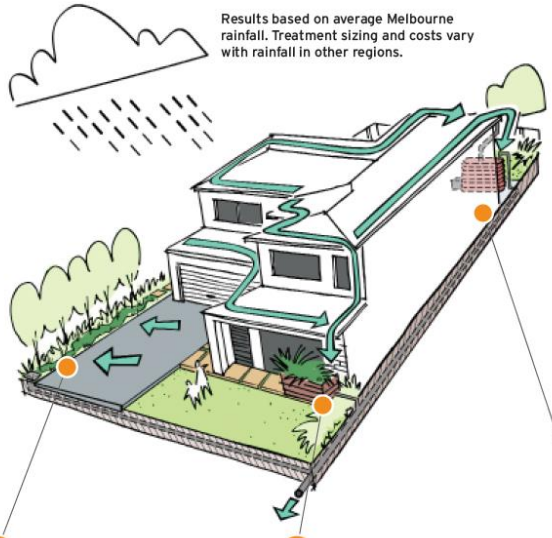
Objectives

25% flow reduction achieved with treatment

Stormwater pollutant load reductions achieved with treatment

What needs to be done?

- 60% of the roof area is connected to a 2 kL rainwater tank for non-drinking water uses.
- 40% of the roof is connected to a raised raingarden of 1 m². Driveway slopes to a swale of 1 m². All other paved surfaces slope to other permeable areas.



Rainfall

Results based on average Melbourne rainfall. Treatment sizing and costs vary with rainfall in other regions.

Urban form

A townhouse is constructed as part of a infill development in an inner urban suburb.

Water context

The new infill development generates increased stormwater flows that can damage local waterways. Capturing and using stormwater will protect your local waterway and enhance the blue and green elements of your development.

Property owners

New property owners would like to live in an attractive low maintenance environment. Owners reduce water bills with the rainwater tank.

Did you know..

At least 20% of the site should have surfaces that can absorb water – such as garden beds, lawn and other unsealed surfaces (Clause 55.03-4).

1 Swale

Rainwater falling on the driveway drains to a vegetated swale. This treats stormwater runoff and allows it to soak into the ground. Any excess water is collected by an overflow drain and is released to the local waterway via drains in the street.

2 Raingarden

Rainwater from the roof drains to a raised raingarden which is designed to temporarily hold and filter stormwater. Some water is used by the plants and the rest is collected by an underdrain and is released to the local waterway via the drains in the street.

3 Rainwater Tank

Rainwater from the roof of each lot is stored in a rainwater tank and used for toilet flushing, laundry washing, and watering the garden.

Scenario 9: 25 per cent flow reduction.

Development type: detached house, infill subdivision.

Stormwater Treatment
Scenario: 25% Flow Reduction

Development type: detached house, infill subdivision

Objectives

25% flow reduction achieved with treatment

Stormwater pollutant load reductions achieved with treatment

What needs to be done?

- 100% of the roof area is connected to a 3 kL rainwater tank for non-drinking water uses.
- 100% of paved areas are porous and allow rainwater to soak directly into underlying soils.

Rainfall

Results based on average Melbourne rainfall. Treatment sizing and costs vary with rainfall in other regions.

Urban form

A detached house is constructed as part of a infill development in an urban suburb.

Water context

The new infill development generates increased stormwater flows that can damage local waterways. Capturing and using stormwater will protect your local waterway and enhance the blue and green elements of your development.

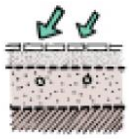
Property owners

New property owners would like to live in an attractive low maintenance environment. Owners reduce water bills with the rainwater tank.

Did you know..

There are many different types of porous paving to suit a range of land uses, existing soils types, aesthetic preferences, and price points.

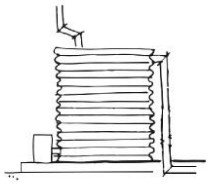
1 Porous Pavement



Rainwater falling on porous pavement used on the driveway, paths and patio soak directly into underlying soils.

This limits the generation of stormwater runoff by allowing some of it to soak into the ground. The rest is slowly collected by an underdrain and is released to the local waterway via drains in the street.

2 Rainwater Tank



Rainwater from the roof is stored in a rainwater tank and used for toilet flushing, laundry washing, and watering the garden.

Scenario 10: 25 per cent flow reduction.

Development type: detached house, infill subdivision.

Stormwater Treatment
Scenario: 25% Flow Reduction

Development type: detached house, infill subdivision

Objectives

25% flow reduction achieved with treatment

Stormwater pollutant load reductions achieved with treatment

What needs to be done?

- 60% of the roof area is connected to a 2 kL rainwater tank for non-drinking water uses.
- 40% of the roof area and all paved areas are connected to a 3 m² in-ground raingarden.

Rainfall

Results based on average Melbourne rainfall. Treatment sizing and costs vary with rainfall in other regions.

Urban form

A detached house is constructed as part of a infill development in an urban suburb.

Water context

The new infill development generates increased stormwater flows that can damage local waterways. Capturing and using stormwater will protect your local waterway and enhance the blue and green elements of your development.

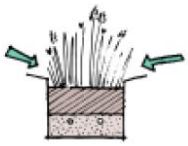
Property owners

New property owners would like to live in an attractive low maintenance environment. Owners reduce water bills with the rainwater tank.

Did you know..

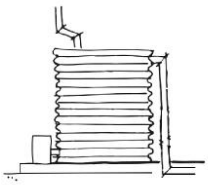
If you install 3 kL rainwater tank for toilet flushing, laundry washing, garden irrigation and internal hot water, you can reduce the area of the raingarden from 3 m² to 2 m².

1 Raingarden



Stormwater runoff from the driveway, paths and roof drains to an unlined, in-ground raingarden in the front garden. The raingarden is designed to temporarily hold and filter stormwater. Some water is used by the plants and some soaks into the underlying soils. The rest is slowly collected by an underdrain and is released to the local waterway via drains in the street.

2 Rainwater Tank



Rainwater from the roof is stored in a rainwater tank and used for toilet flushing, laundry washing, and watering the garden.

4 Glossary

Baseflow
The component of streamflow groundwater discharge supplies.

Development
Includes construction or carrying out of works, including building and road construction.

Flow regime
The range of flows a waterway experiences throughout the seasons and years, which may include baseflows, low flows, high flows, overbank flow and cease to flow (drying) events.

Impervious
Impermeable; sealed surfaces, such as roofs and roads.

Receptor
Something of value that hazards can harm, including humans and the environment. For example, animals, vegetation and waterways. We use 'receptor' and 'receiver' interchangeably in this guide.

Sensitive receivers
Sensitive areas or species from a human or environmental context, which include, but are not limited to:

- social surroundings (houses, hospitals, schools, playgrounds, public amenities)
- waterways, streams, sources of drinking water for people or livestock
- parks and recreational areas
- areas of public interest and cultural significance
- land or water with identified flora, fauna, vegetation, ecosystem or environmental value.

Stormwater
Surface runoff from rain and storm events.

Treatment train
A sequence of treatment controls designed to manage potential impacts to the environment.

Urban
Areas that are well developed for residential, industrial or commercial activities, including roads.

Waterway
Has the same meaning as in the *Water Act 1989* and includes a river, creek, lake or other body of water.

5 Appendix

5.1 Identify hazards: why is uncontrolled urban stormwater a hazard?

Urban runoff carries a range of pollutants that degrade waterways, including wetlands, beaches and bays. Changes to waterways' flow regimes that urban stormwater runoff causes also damages aquatic ecosystems and reduces amenity by, for example, erosion and litter transport.

What activities generate urban stormwater?

The creation of impervious surfaces – including roads, residential or commercial development – generates urban stormwater. In forested or vegetated catchments, rain or surface water is taken up by trees and plants, or infiltrates into the soil and travels to waterways as subsurface flows. However, in urban catchments impervious surfaces like roofs and roads replace this natural landscape. Rain runs off these surfaces and drains rapidly transport it into rivers, lakes, estuaries and bays. This runoff is called urban stormwater and has the potential to cause harm to human health and the environment.

The impacts of urban development on the water cycle are shown in Figure 3, which compares the urban water cycle in an undeveloped catchment (left) and an urban catchment (right). It shows the relative scale of evaporation, transpiration and surface runoff in each setting. The size of the arrows represents the volumes of water these processes transport.

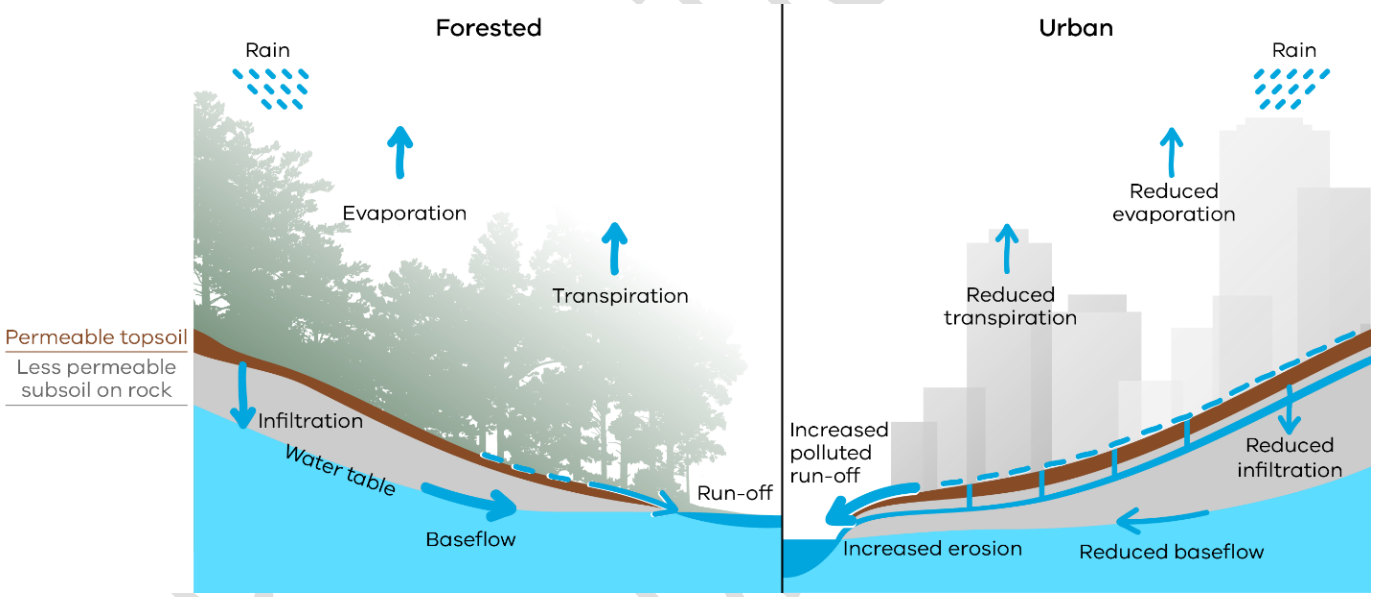


Figure 3: Melbourne Water 2013 (adapted from Walsh et al., 2004).

Potential impacts of urban stormwater discharges

The changes to stormwater volume and quality resulting from urbanisation can have a significant impact on surface waters, including:

- rivers
- streams
- lakes
- estuaries
- wetlands
- bays
- coastal waters.

The increased flows of polluted stormwater can have significant adverse consequences in urbanised areas.

Degradation of urban waterways

Urban stormwater impacts contribute significantly to the degradation of waterway ecologies.[4] Even at low levels of urbanisation, significant adverse impacts can occur when impervious surfaces are connected to urban streams through drainage pipes[5]. These impacts can cause significant harm to aquatic ecosystems, particularly sensitive species of invertebrates and fish, and also platypus.

Modelling suggests that to maintain the ecological values of many relatively healthy streams in Melbourne's growth areas, very high volumes of stormwater would have to be retained or reused. In particular, streams in the northern and western growth corridors are in drier parts of the city, and therefore would need higher stormwater flow reductions to avoid impacts.

Conventional drainage practices transport stormwater to urban waterways as quickly as possible. The continued use of these practices is expected to cause the degradation of an additional 900 kilometres or more of stream length when Melbourne is developed to its urban growth boundary.[6]

Many of Victoria's regional cities and towns are also growing substantially. There is similar potential for degradation of waterways associated with these centres unless stormwater management practices improve.

Degradation of downstream waterbodies

Uncontrolled stormwater runoff can also harm downstream bays, lakes and coastal waters, and pose a risk of harm to human health. For example, urban stormwater runoff is a threat to the values of Port Phillip and Western Port bays, as it carries sediments, nutrients, toxicants, pathogens and litter.

The *Port Phillip Bay Environmental Management Plan* emphasises the need to control the levels of pollutants that stormwater carries to the bay to avoid increases in pollutant loads as Victoria's population and urbanisation continue to expand.

Heavy storms can flush stormwater and other forms of pollution into bays, lakes and streams, making them less safe for swimming, as evidenced by beach advisories in Port Philip Bay following storms.

Catchment management authorities develop regional waterway strategies identifying priority waterways and management actions to reduce the threat of poor water quality.

Economic impacts

There are other adverse impacts associated with urban stormwater's degradation of urban waterways and downstream water bodies. These include economic impacts on tourism, commercial fishing and aquaculture. These impacts are likely to grow along with Victoria's population levels. If current management scenarios continue it is expected there will be:

- greater stormwater-related flooding
- reduced public safety
- damage to community infrastructure and private property.

[4] Fletcher, T.J., et al. 2011
[5] Walsh, C. J., et al. 2005
[6] Vietz, G. J., et al. 2014

Social impacts

The conventional drainage practices that transport stormwater to urban waterways as quickly as possible result in lost opportunities to use stormwater more productively, for example:

- mitigating the 'urban heat island' effect (discussed below)
- reducing potable water consumption. For example, through open space watering
- supporting greener, more pleasant urban landscapes
- maintaining vegetation in community spaces during extended periods of low rainfall.

The urban heat island effect refers to the general increase in temperatures in urban areas, compared with surrounding rural land.[7] There is evidence that this effect exacerbates the increased mortality and morbidity associated with extreme heat events.[8] Effective use of stormwater has been identified as a way to mitigate the urban heat island effect, including by increasing evapotranspiration and increasing the availability of water to support urban vegetation.[9]

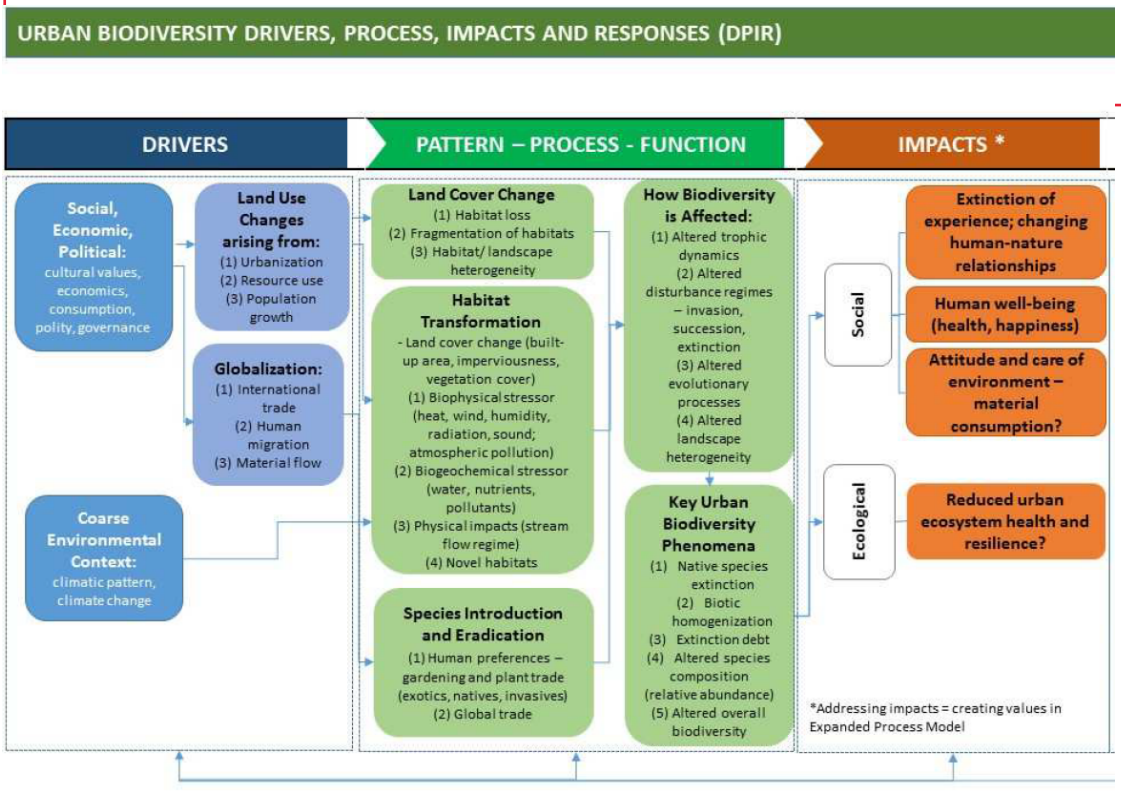
In summary, conventional stormwater management can cause:

- significant harm to receiving environments
- additional financial costs for the community and waterway managers
- waste of a useful resource, in particular for urban green spaces.

Without changes in management practices, these impacts on the environment and human health will continue.

We took the perspective of a city as an urban ecosystem, or a socio-ecological system, in which the social and ecological components are inextricably linked, WSUD ecologically-informed approach towards urban hydrological management. land use and land cover changes are key drivers affecting urban hydrological balance and impacting urban biodiveristy, which human well-being and urban functions fundamentally built-on. Its explains the relation in detail in a diagram below

it is also critical to create new social, cultural and economic value in urban spaces integrating blue green infrastructure/ WSUD.



[9] Mitchell, V.G., et al. 2008, and Coutts, A. M., et al. 2013.

6 References

Alexander, L.V. and Julie M.A. 2009, *Assessing trends in observed and modelled climate extremes over Australia in relation to future projections*. International Journal of Climatology 29 (3): 417–435.

Arnfield, A. J. 2003, *Two decades of urban climate research: a review of turbulence, exchanges of energy and water, and the urban heat island*. International Journal of Climatology 23(1): 1–26.

Coutts, A.M., Nigel J.T., Beringer, J., Loughnan, M. and Demuzere M. 2013, *Watering our cities: the capacity for water sensitive urban design to support urban cooling and improve human thermal comfort in the Australian context*. Progress in Physical Geography 37 (1): 2–28.

Department of Environment, Land, Water and Planning 2017, *Apartment Design Guidelines for Victoria.*

Department of Environment, Land, Water and Planning 2017, *Port Phillip Environmental Management Plan 2017–2027*.

Department of Environment, Land, Water and Planning 2018, *Amendment VC154 – Stormwater Management, Planning Advisory Note 75*.

Department of Sustainability and Environment 2006, *Using the integrated water management provisions of clause 56 – Residential subdivision*.

Environment Protection Authority Victoria 2004, *Doing it right on subdivisions: Temporary environmental protection measures for subdivision construction sites*, publication 960.

Environment Protection Authority Victoria 2018, *Liquid storage and handling guidelines*, publication 1698.

Environment Protection Authority Victoria 2020, *Erosion and sediment advice for businesses*, viewed 2 October 2020, https://www.epa.vic.gov.au/for-business/find-a-topic/erosion-and-sediment/advice-for-businesses.

Environment Protection Authority Victoria 2019, *Solid storage and handling guidelines*, publication 1730.

Fletcher, T.D., Walsh, C.J., Vietz, G., Hatt, B., Thompson, R., Stewardson, M., Burns, M.J. and Hamel, P. 2011, *Stormwater management in a Water Sensitive City. Appendix 4: Stream ecology: Managing and harvesting urban stormwater for stream health,* in *Blueprint 2011, Stormwater management in a Water Sensitive City*. Melbourne: Centre for Water Sensitive Cities

Melbourne Water 2013, *Stormwater Strategy November 2013*. Melbourne: Melbourne Water.

Melbourne Water 2018, *Healthy Waterways Strategy 2018*. Melbourne: Melbourne Water.

Mitchell, V.G., Cleugh, H.A., Grimmond, C.S.B. and Xu J. 2008, *Linking urban water balance and energy balance models to analyse urban design options.* Hydrological processes 22 (16): 2891–2900.

Vietz, G.J., Rutherfurd, I. D., Walsh, C.J., Chee, Y.U. and Hatt, B.E. 2014, *The unaccounted costs of conventional urban development: protecting stream systems in an age of urban sprawl,* in Vietz, G; Rutherfurd, I.D, and Hughes, R. (editors), Proceedings of the 7th Australian Stream Management Conference. Townsville, pages 418–424.

Walsh, C.J., Ladson A.W., Ladson A.R. and Fletcher T.D. 2004, *Urban stormwater and the ecology of streams*. Canberra: Cooperative Research Centre for Freshwater Ecology and Cooperative Research Centre for Catchment Hydrology.

Walsh, C.J., Fletcher T.D., and Ladson, A.R. 2005, *Stream restoration in urban catchments through redesigning stormwater systems: looking to the catchment to save the stream.* Journal of the North American Benthological Society 24 (3): 690–705.

16th December 2020

Ms Sigourney Irvine
EPA Victoria
200 Victoria Street,
Carlton VIC 3053

cc. contact@epa.vic.gov.au

To Sigourney,

Reference: Feedback on Draft urban stormwater management guidance - EPA publication 1739

Afflux consulting is pleased to provide our feedback on the consultation document “Draft urban stormwater management guidance - EPA publication 1739 (October 2020)).

Afflux is a consultancy firm that specialises in the development of stormwater management plans, design of stormwater assets and advising developers and authorities on flood and water quality related impacts of urban development. With close linkages to the broader stormwater industry, we are at the ‘coal face’ and have a wealth of practical experience in how policy outcomes are translated in practice. Our internal projects cover both private (developer, schools, businesses, and home owners) and public (local and state government, and authorities like Melbourne Water, Yarra Valley Water, etc) based projects, so we speak for a variety of clients, asset owners and motivations.

At the outset we understand the Environment Protection Act (EP Act) has been substantially modernised and uses the concept of a General Environmental Duty (GED) at its core. Compliance with the GED is supported by other constructs, including ‘state of knowledge’ and (hopefully) complementary procedures, policies and strategies (e.g. Healthy Waterways Strategy (HWS)). The GED is understood to be enforceable by both agencies and the general public which will place further scrutiny on decision makers and approvals processes[1].

As consultants advising industry, it is our role to understand and navigate requirements of the various approval processes. We are eager to see new guidance like this that incorporates updated flow and volume standard targets in addition to the previous focus on water quality. Flow/volume standard targets in projects are essential to protect and rehabilitate our waterways, however we do have concerns on the ability to achieve the new targets in all settings. Particularly considering the practicality of working in a real-world situation where there are conflicting standards and pressures, including:

- Legacy situations where land use and servicing decisions have previously been made and pose problematic obstacles.
- Complexities in gaining the support and co-operation of public land managers and water authorities to implement solutions away from private land.
- Land take considerations that require managing competing objectives for lot yield, private and public open space, service authority assets and meeting geotechnical objectives.
- Competing functional objectives of surrounding infrastructure and their perceived impacts on operational effectiveness, for instance incorporating permeability in the road pavement.

The draft guidance includes a set of examples where the proposed standards have been met, however in our experience these the targets are not always achievable when factoring in the issues above. The

[1] Action bought by community based Moorabool Environment Group groups recently caused the EPA to rescind a decision to approve a landfill operation associated with West Gate tunnel soil disposal

examples provided do not have sufficient detail to allow them to be properly critiqued. The scientific review, which adds to the State of Knowledge is deficient in that it also does not have a strong emphasis on the hydraulic aspects of stormwater design, instead focussing on water quality and stream flow indicators. This is a common approach in Victoria which is not emphasised in other jurisdictions. As consultants we provide advice on balancing competing outcomes and believe this is an important area that will require rectification into the future.

Recommendation: Further evidence on the development of the ranges and scenarios would be welcomed.

We feel much of the industry will look at a range for a flow standard and aim at the lower end. A clear minimum expected target that reflects the rainfall and needs of the catchment, would be easier for us to implement than a range. Ideally these targets should reflect and respond to existing strategies, such as the HWS. Any flow standards expected in those strategies should be referenced in the guideline to avoid confusion.

Recommendation: Flow standards should reflect existing relevant strategies within the catchment to ensure clarity in implementation.

Recommendation: Flow standards should be set as a clear minimum target (not a range), reflective of the catchment, and provided in the form of a map or table.

From our experience, the active and collaborative involvement of councils and water authorities will be critical if more ambitious levels of flow reduction are to be achieved through initiatives such as local stormwater harvesting. While there is considerable policy interest in Integrated Water Management across these regulating agencies, it does not easily translate into tangible action. Often the nature of Land Development is propelled by the market where time becomes the primary driver to delivery. We find that agencies are not always able to respond quickly enough with 'plans' and budgets to support this growth. An expedited update to the Developer Services Schemes, Drainage Schemes or Development Plans across the state should be undertaken. These should reflect the guidelines and incorporate considered project outcomes for catchments to avoid a siloed response by pocket projects. Ownership and maintenance of the projects will need to be included in the redevelopment of the schemes to ensure the longevity of the initiatives beyond the capital expenditure.

Recommendation: Collaborative projects that meet the objectives of the guidelines will need to be established in catchments to ensure the successful implementation of the guideline doesn't result in isolated and unmaintainable outcomes.

The term the 'reasonably practicable' may generate some uncertainty in the industry and does not provide us with a strong stance in enforcing the new guideline. There is risk, that the term could be used to avoid any good urban stormwater initiatives (flow or water quality).

Recommendation: Remove the term 'reasonably practicable' from the guideline.

In order to implement the guidelines, a variety of assessment tools will be required by local governments and relevant authorities. MUSIC, the Storm Tool, and more recently InSite, have been used to assess the water quality and quantity outcomes of a project with varying degrees of success and accuracy. While Afflux often advises on more complex development typologies, we are aware of the general detriment caused by sub-standard or poorly conceived design based on using the wrong tool[2]. At this stage the STORM tool provided by Melbourne Water is not able to support the same level of integration and will require significant investment or alternatives like InSite, sought.

Recommendation: A variety of integrated assessment tools will need to be developed or re-developed to provide an accurate reflection on the initiatives chosen for projects. Investment from leading Government agencies like the EPA will be required.

[2] Poor designs include incorrect sizing calculations, impractical siting of water treatment elements which can delay approvals or result in objectives not being achieved.

Finally, we'd like to thank you for the opportunity to be involved in the development and implementation of the guidelines with this feedback. We feel the changes and progression of the stormwater industry is contingent on thorough research, modelling and engagement to establish new guidelines, regulations, tools and governance. This will ensure the protection of the waterways and future health of the environment we live in.

Sincerely

Chris Beardshaw

Director Afflux Consulting

Afflux Consulting Pty Ltd
PO Box 457 Emerald VIC 3782

03 9036 2530 / 0417 169 182

info@afflux.com.au

afflux.com.au

To: Urban StormwaterBPEM <urbanstormwaterbpem@epa.vic.gov.au>
Subject: draft urban stormwater management guidance

Hello there,

Apologies that these comments on the draft urban stormwater management guidance are both brief and late in the day.

Firstly, I'd like to convey Merri Creek Management Committee's (MCMC) appreciation for the work that has gone into the science behind the guidance document and for the efforts of the many at the EPA and elsewhere who are committed to improving the treatment of stormwater and lessening the rate at which our waterways are degrading.

Almost the entire catchment of Merri Creek is now within the UGB and we are all too aware of the threat of urban stormwater to the catchment's waterways.

We are disappointed that the new proposed objectives for urban stormwater flow reduction are not compliance requirements. In the meantime we very much hope that your guidance document leads to improved performance in flow reductions and proves to be effective and useful for its target audiences.

Regards, Luisa

Luisa Macmillan Manager | Merri Creek Management Committee www.mcmc.org.au

16 December 2020 Doc No: COR/

Policy & Regulation Unit
Environmental Protection Authority Victoria (EPA)
200 Victoria St
Carlton, VIC, 3053

Sent via email: urbanstormwaterbpem@epa.vic.gov.au

Policy & Regulation Unit,

Re: Draft urban stormwater management guidance – Publication 1739, October 2020

Thank you for the opportunity to comment on the draft urban stormwater management guidance (publication 1739, Date: 21st October 2020) by the EPA.

In addition to the draft guidance, the VPA have been provided the following documents by the EPA.

- Background information: Draft urban stormwater management guidance consultation guide document (publication 1829, October 2020)
- Review of stormwater science (publication 1919, October 2020)

The following comments are offered in the context of land development and the land use planning work undertaken by the VPA.

Table 1 below shows the current proposed performance objective guidelines from the draft guidance (also refer to page 7 of the draft guidance). The target objectives are a little ambiguous and open to interpretation.

Table 1: Quantitative performance objectives for urban stormwater

Indicator	Performance objective
Suspended solids	80% reduction in mean annual load (Note:1, 2, 6)
Total phosphorus	45% reduction in mean annual load (Note:1, 2, 6)
Total nitrogen	45% reduction in mean annual load (Note:1, 2, 6)
Baseflow contribution	10% of mean annual rainfall volume to contribute to baseflow (Note: 2, 4, 5)
Flow reduction	50 – 90% reduction in mean annual total runoff volume in priority areas for enhanced stormwater management (Note: 2, 3, 7)
Flow reduction	25% reduction in mean annual total runoff volume in areas that have not been identified as priority areas for enhanced stormwater management (Note: 2, 3)
Litter	70% reduction of mean annual load

Developers are keen to take the easiest and most cost-efficient option for their developments. In providing a range for percentage of flow reduction for priority areas, developers will most likely target the lowest requirement to save on infrastructure costs, which is likely reduce overall treatment effectiveness.

At present, it is not easy to identify if a development is within a priority area. This could be improved with use of a special planning overlay for the priority areas, that will be triggered by planning permit applications. That way, developers and consultants can confirm their sites are within priority areas.

Note 2, referred to in table 1, advises “these are general objectives, and, in some cases, a higher or lower percentage of flow reduction objective may be justified” (refer to page 7 of the draft guidance) which creates a grey area. It can be difficulty to practically meet the performance objectives on some developments, and although note 2 attempts to address this, it would be ideal if a standardised approach could be adopted instead.

For example, the use of Melbourne Water’s stormwater quality offset contribution, so that developers can make a financial contribution for the difference when practically unable to meet the performance objectives. Although with this approach, absolute minimum performance objective targets and higher contribution fees may be required to encourage implementation of water sensitive urban design (WSUD) treatments as the first option.

Brownfield townhouse subdivisions are becoming more popular and increasing in size. The draft guide only provides scenarios for 25% flow reduction however not the 50-90% flow reduction required for priority areas. It can be challenging to meet the performance objectives and additional guidance for sites within priority areas would be beneficial.

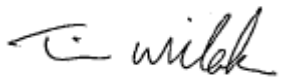
For example, underground stormwater harvesting tanks within roadways can be more practical then large rainwater tanks for brownfield subdivisions due to space constraints within lots.

We would also like to take the opportunity to add to our previous comments regarding BEPM. We look forward to seeing the Regulatory Impact Assessment (RIS), for BEPM, and are very interested to see how it will be possible to develop a cost base without a clear picture of the potential integrated water management implications in different settings?

We hope the above feedback will assist in the finalisation of the urban stormwater management guide.

VPA Contact
Should you have any queries regarding these comments please contact Chris Braddock, Water and Engineering Manager, e: Chris.Braddock@vpa.vic.gov.au

Yours sincerely



TIM MILEHAM
DIRECTOR INFRASTRUCTURE

18 December 2020

Sigourney Irvine
Senior Policy Officer
Environment Protection Authority Victoria

By email: urbanstormwaterbpem@epa.vic.gov.au

Dear Sigourney Irvine,

UDIA Victoria Submission: Draft Urban Stormwater Management Guidance

The Urban Development Industry of Australia, Victoria Division (UDIA Victoria) is a non-profit advocacy, research and educational organisation supported by a membership of land use and property development organisations, across the private sector and Victoria's public service. We are committed to working with both industry and Government to deliver housing, infrastructure, and liveable communities for all Victorians.

UDIA Victoria congratulates the Environmental Protection Authority (EPA) on the preparation of the draft Urban Stormwater Management Guidance (Publication 1739). The guidance package represents a considerable body of work that advances the collective understanding of the potential risks of urban stormwater runoff. In acknowledging their General Environmental Duty, the UDIA Victoria membership is appreciative of the addition of this work to the state of knowledge on this important component of our urban system, and the intent of the guidance to help improve the management of urban stormwater in Victoria. UDIA Victoria share the EPA's commitment to supporting minimisation of the risk of harm to human health and the environment through good environmental practice.

Further, we commend the EPA for the format and legibility of the guidance package. The background information consultation guide is a very useful summary of the intent and key elements of the initiative, and the Draft Guidance itself we found to be informative and visually engaging.

Key Issues

This submission is structured around two key themes:

- **Guidance Intent and Implementation.** UDIA Victoria is concerned at the potential for the guidance to take on a level of weight in local and agency level decision-making that it is not intended to have at this point. We seek clarity on how it is to be implemented in practice.
- **Impact on Cost and Development Feasibility**. UDIA Victoria urges the EPA to ensure that any process to advance the status of the guidance through its implementation into the Victorian Planning Provisions, or other form of adopted policy or practice note, is informed by a thorough economic appraisal which reflects the potential impact on development (and ultimately housing) affordability.

Each of these key issues is now addressed in more detail.

Guidance Intent and Implementation

The guidance package makes it clear that it is not intended as any form of compliance, control, requirement or other form of objective that has statutory weight in the decision-making arena. More

specifically, the guidance is couched as primarily an educational resource for developers, technical consultants and other stakeholders in the development industry, to help build knowledge around stormwater flows, understand risk, and assist with the design and evaluation of stormwater assessments.

UDIA Victoria is highly supportive of the EPA's intent with this work – as part of the broader engagement undertaken with industry reference groups over the past 1-2 years in advance of the new environmental laws coming into effect on 1 July 2021 – to become a proactive organisation as opposed to. Our members are supportive of this educational focus.

However, the guidance could be interpreted as setting baseline objectives for stormwater management performance. For example, on Page 7 of the Guidance it states:

> *Metrics to assist you to evaluate risk of harm*
>
> *The following table is an additional tool to assist in evaluating risk of harm. Performance against the objectives in Table 1 can be used as a signal of the level of risk of waterway values being lost or impacted. EPA regards development that does not meet those performance objectives as presenting a high risk of harm.*

Table 1 then includes the following Indicator and Performance Objectives:

Indicator:	*Flow reduction*
Performance Objectives:	*50 – 90% reduction in mean annual total runoff volume in priority areas for enhanced stormwater management (Note: 2, 3, 7)*
	25% reduction in mean annual total runoff volume in areas that have not been identified as priority areas for enhanced stormwater management (Note: 2, 3)

Taking the 25% reduction Performance Objective, it is unclear how this objective would relate to existing, established and well documented and enforced stormwater management practices already in operation, for example the development services schemes applicable within Melbourne's various catchment areas, and which are tightly applied through precinct structure planning in the growth areas. Our members are experienced with this system, which is tried and tested, has evolved in accordance with existing, largely scrutinised policy and legislation, and is effectively governed such that drainage solutions are not approved unless they demonstrate best practice.

The guidance may be targeted more at smaller scaled operators or those with less experience dealing with the catchment management and water authorities and existing regulatory and legislative requirements surround stormwater management. If this is the case, this could be made clear in the guidance, together with a statement acknowledging these existing practices and that a large proportion of the industry is already adequately meeting its stormwater management obligations.

Acknowledging that it may take some time to observe what is 'reasonably practical' in terms of a baseline level of stormwater flow, it is probable that this body of work will ultimately influence any Department of Environment, Land, Water and Planning review of the Victorian Planning Provisions. Our members' experience is also that once guidance such as this is in the public domain, it can begin to take on a level of weight in decision-making processes that it does not statutorily have, or intend to have. Given the myriad of policy, guidance, regulatory and legislative requirements already applicable to new development, UDIA Victoria is concerned that the messaging around the Draft Urban Stormwater Management Guidance is unclear on its role and direct relevance to development proposals.

When it comes to considering how any new guidance is translated into policy, regulation or legislation, UDIA Victoria would recommend the following matters for consideration:

- That a sliding scale of flow reduction targets be introduced, rather than moving straight to a minimum 25% reduction, for example commencing at 10% and increasing on the basis of close monitoring and industry engagement;
- That pilot projects be considered, including on government land, where the new initiatives are delivered and tested for their efficacy in meeting overall stormwater flow and quality objectives;
- That the guidance (and future policy, regulation and guidance), make it clear what parts of the metropolitan footprint it is applicable to. For example, it is currently unclear whether the guidance is suggesting that precinct structure plans in Melbourne's growth areas be 25% more efficient again, or that stormwater be conveyed through these areas under existing procedures and approval processes, where it is treated at a single large site that has been specifically identified for this purpose;
- That the guidance make a distinction between greenfield and infill development in established areas. We assert that greenfield areas are largely taking care of themselves from a stormwater management perspective, and will continue to do so and meet best practice, even as density increases. It could therefore be construed that the 25% flow reduction objective is a doubling up of expectations on future development when this standard may be being achieved already; and
- That any changes to current practices and expectations of the industry be subject to a thorough economic appraisal before being implemented. Please refer below.

Impact on Cost and Development Feasibility

The cost implications of regular additional policy requirements being introduced to the development sector on an ongoing basis is a fundamentally critical issues facing our members, and more broadly the affordability of housing within the state of Victoria.

UDIA Victoria research released in July 2020 – *The Hidden Cost of Housing* – assesses the relationship between housing affordability and government policy, taxes, charges and levies. The research finds that government charges cost up to 34% of a local homebuyer's purchase price of a new residential lot or dwelling, depending on the circumstances of the homebuyer and the property they are buying. The research report concludes that the current system is not conducive to housing affordability, which is heavily reliant on development to be commercially viable. The report recommends a whole-of-government approach be adopted in the process of introducing new policy requirements, to ensure the total range of cost drivers impacting on housing is assessed in this context before new policy is enforced that could exacerbate Victoria's housing affordability issues. A copy of the research report, *The Hidden Cost of Housing*, is attached to this submission for your information.

UDIA Victoria has observed a steady reduction in the amount of net developable area associated with Precinct Structure Plans over the past decade, which in part is due to increasing land takes associated with different forms of open space including encumbered land for drainage purposes. This has had a direct implication on the affordability of developing land.

UDIA Victoria is concerned that the implications of achieving the Performance Objectives specified in the draft Urban Stormwater Management Guidance on the viability of developing land, in terms of cost and/or land take, could be the difference between development occurring in accordance with local and metropolitan strategic guidance or not.

We acknowledge that it is a self-compliance requirement for government that a Regulatory Impact Statement be prepared before the adoption of any new legislation, one of the roles of which is to understand the expected impacts (benefits and costs) of policy options and to determine a preferred option.

However, even before this occurs, and given our comments above regarding the tendency for guidance to indirectly start influencing decision-making processes (even where there is no intent for it to do so), UDIA Victoria urges the EPA to carry out some economic analysis on the per lot or dwelling cost of complying with the 25% or 50-90% flow reduction objectives in the guidance. This would be a helpful informant in development of the guidance and its eventual progression into policy or controls that will be applied to development in the future. UDIA Victoria would be pleased to provide an industry perspective on this and offer a selection of our members for the EPA to engage with more closely across a range of development and technical settings if this would be of benefit.

Conclusion

UDIA Victoria congratulates the EPA for completing this significant, data-led exercise, which is a valuable and welcomed addition to the state of knowledge around stormwater management and potential risk. Our members are at the coal face and work through ever increasing regulation which strives to increase the quality of development and infrastructure outcomes. Rising standards and calls for more policy and regulation with financial implications need to be carefully weighed and balanced. Our issues with the Draft Urban Stormwater Management guidance are focused towards how the guidance is interpreted and implemented, bearing in mind the potential additional implications of land development and housing affordability.

UDIA Victoria looks forward to further engaging with you and your team and welcomes a chance to meet and discuss our submission in greater detail. Please contact Hyatt Nidam, Engagement and Communications Manager at hyatt@udiavic.com.au to arrange a suitable time to do so.

Yours sincerely,

Angela Gaedke

Acting Chief Executive Officer

Urban Development Institute Australia (Victoria)
Level 4, 437 St Kilda Road, Melbourne, 3004
M. 0400 088 158
E. angela@udiavic.com.au

Attachments:

1. UDIA Submission to City of Melbourne Affordable Housing Strategy
2. UDIA Victoria Submission regarding Strategic Redevelopment Areas ICP
3. The Hidden Cost of Housing

4 May 2020

Emma Appleton
Director, City Strategy
City of Melbourne

By email: affordablehousing@melbourne.vic.gov.au

Dear Emma,

City of Melbourne Affordable Housing Strategy – UDIA Victoria Submission

The Urban Development Industry of Australia, Victoria Division (UDIA Victoria) is a non-profit advocacy, research and educational organisation supported by a membership of land use and property development organisations, across the private sector and Victoria's public service. We are committed to working with both industry and Government to deliver housing, infrastructure and liveable communities for all Victorians.

The building, construction and development industry contributes almost half of the state Government's tax base, employs almost 300,000 Victorians and is a major contributor to the Victorian economy.

UDIA Victoria commends the City of Melbourne on the deep work and consultation done to date which supports the draft Affordable Housing Strategy 2030 (**the Draft Strategy**). We welcome the opportunity to work with the City of Melbourne to explore how affordable housing can be delivered and increased and note that we have participated in two important workshops with the City of Melbourne and members of our Board of Directors and policy committees.

Demonstrating our longstanding commitment to finding real solutions to the affordable housing challenge faced by Victoria, UDIA Victoria has been an active member of the Affordable Housing Industry Advisory Group (AHIAG) since its establishment in 2016. In 2019 we delivered the *Introduction to Property Development Economics for Affordable Housing* course, on behalf of the Department of Environment, Land, Water and Planning's (DELWP).

Our mutual objectives to boost housing supply and to make it more affordable, are aligned. Where we differ, is where the responsibility for funding affordable housing should lie and what is the most appropriate strategy is to increase affordable housing stock.

From the early 1980's when social housing comprised around 10% to 15% of new dwellings, Government investment has dwindled to now represent around 2% to 3% of new dwellings. Historically, social housing was seen in public policy as being a welfare issue rather than an economic issue. The real reason for our inadequate supply of affordable housing, has been the lack of priority given by successive state Governments to investing in social and affordable housing.

We appreciate that Councils, being at the community frontline, experience the societal consequences of there not being sufficient affordable housing supply, and have to find real solutions for the implications of inadequate Government investment.

The current housing affordability crisis cannot be solved through Victoria's planning system alone, or by having various arrangements in place at the Council level. The solution requires a whole of Government approach underpinned by significant capital investment from the state Government.

Affordable housing is social infrastructure that is a broader community issue; the solution to which should not be isolated to the private sector. Significant underinvestment by governments over time cannot be successfully remedied by leveraging the new housing markets in a way which will directly result in further price lift and reduced affordability.

The urban development industry is ready, willing and able to deliver affordable housing in partnership, but not at the expense of investment certainty and project feasibility. Further, the failure to adequately transition any new controls in recognition of market cycles, will result in a reduction in housing supply and, perversely, an increase in median house prices.

Our most experienced members strongly believe that the measures proposed by the Draft Strategy will make investment and development in the City of Melbourne unattractive, leading to less housing supply. Asset owners will respond in ways that will constrain residential development opportunities. They will shift and pivot their strategies toward other asset creation opportunities, rather than reduce land values as has been assumed by the City of Melbourne. Where developments do proceed, they will do so only when retail prices lift to allow cost to be passed on future home buyers, making housing less affordable.

An alternative approach

Noting the clear direction of the City of Melbourne, as well as the Victorian Government to address affordable housing through the planning system, UDIA Victoria has proposed a balanced approach that we believe has the best chance of delivering affordable housing outcomes at scale without compromising supply or the median house price.

The approach comprises:

- a low, flat rate, broad-based Affordable Housing Contribution, similar to the Fire Services Levy, transitioned over a period not less than 5 years, to replace all other affordable housing provisions;
- affordable housing delivery targets, supported by an Affordable Housing Delivery Toolkit of funding and incentive measures that can be applied to fund the gap between the cost of delivering and the Affordable Housing Contribution; and
- a comprehensive capacity building program targeting all stakeholders – all levels of government, development and community housing industries, financiers, and the community — to create common shared understanding of interests of the various parties, and outline the various ways in which affordable housing outcomes can be delivered to meet the varied needs of very low, low and moderate income households including key workers.

Going forward

We strongly urge the City of Melbourne to consider:

1. The industry experience and depth of knowledge represented in the solutions put forward by UDIA Victoria;
2. Calling on the Victorian Government to establish a whole-of-government Affordable Housing Strategy rather than seeking to introduce affordable housing requirements at the Council level;

3. Avoiding unworkable and unnecessary duplication at various levels of government and to include the City of Melbourne's approach in the state-government led strategy;

UDIA Victoria has written to the Minister for Planning requesting a moratorium on any new policy settings or increased fees and charges that would have a material impact on the cost of producing housing, until the COVID-19 pandemic period has passed. As such, we strongly urge the City of Melbourne to:

4. Give proper consideration to the difficulties facing the building, construction and development industry as well as the housing market, as a result of the COVID-19 pandemic and to delay progressing the Draft Strategy until at least 1 July 2021.

Finally, we again commend the City of Melbourne on the work done to develop and consult on the Draft Strategy. Just like the City of Melbourne, we are committed to finding real, tangible and meaningful solutions to Victoria's affordable housing crisis.

Our objectives are aligned; let us work more closely on positive solutions.

We look forward to continuing to work closely with the City of Melbourne. Please contact me directly at danni@udiavic.com.au to discuss this submission further.

Yours sincerely

Danni Hunter
Chief Executive Officer
Urban Development Institute Australia (Victoria)

P. 03 9832 9600
E. danni@udiavic.com.au

Submission to City of Melbourne Draft Affordable Housing Strategy

Introduction

UDIA Victoria's positions on the provision of affordable housing through the planning system have been developed through a broad and deliberate program of member consultation led by our CEO and Board of Directors and involving our member Committees including our Planning Committee, Greenfield Developers Committee and Apartment and Urban Renewal Committee.

In 2019, UDIA Victoria prepared two key submissions to the Ministerial Advisory Committee on Planning Mechanisms for Affordable Housing.

These submissions are at Attachment A and Attachment B.

> ***UDIA Victoria has a deeply established position that the planning system is not the appropriate mechanism through which Government should seek to access additional affordable housing, and that a more sophisticated framework of funding and a 'Toolkit' approach is in fact required.***
>
> ***A real solution for Victoria's shortage of affordable housing at volume will require a whole of government response predominantly driven by fiscal initiatives.***

The urban development industry is not responsible for funding a crisis that has built over several generations and successive Governments. A whole of Government approach is required. A broad-based levy, for example the Fire Services Levy, could be used to help fund affordable housing, and we note that property related taxes already deliver close to half of all Government revenue.

Having reviewed and visited international examples, the 'Toolkit' approach is evidenced to be the most effective in delivering the highest number of new dwellings. Adding to this approach, is the need for a necessary funding stream so that affordable housing dwellings can in fact be acquired by appropriate community housing providers, with certainty.

Impact of COVID-19

The COVID-19 crisis needs to be resolved before any further policy change or cost imposts can be considered. UDIA Victoria is working with the Victorian Government and the Building Victoria's Recovery Taskforce to support the building, construction and development industry through the COVID-19 pandemic period, and to save jobs and grow jobs on the other side.

UDIA Victoria has written to the Minister for Planning asking that the Government consider establishing a moratorium on policy changes and additional costs which would impact the cost of producing new housing, until mid-2021. A copy of this letter is provided at Attachment C.

These including but are not limited to:

State Government

- Any proposal on foot to implement a state-wide Social and Affordable Housing Levy.
- Any proposal for a new infrastructure contribution for strategic redevelopment areas.
- Annual indexation and increase of the Growth Areas Infrastructure Contribution (GAIC).

- Adjustment and Indexation of the Melbourne Strategic Environmental Mitigation Levy (EML).
- Better Apartment Design Guideline amendments which are currently the subject of consultation.

Local Government

- Proposals for new design standards and requirements. Councils continue to work on ad hoc planning scheme amendments that apply new local policies to development in their municipalities.
- Proposals for social and affordable housing. More than 40 Councils have various proposals on foot to prepare planning scheme amendments that will support new local policies for social and affordable housing which may include imposing Section 173 Agreements in exchange for development approvals.
- Proposals to increase public open space levies. A number of councils have planning scheme amendments generate proposals to increase open space contributions in established suburbs under the Subdivision Act. As an example, Amendment C186 to Darebin Planning Scheme proposes to double the public open space contribution on development to 10%.

Cost of producing new housing

Taxes and charges that contribute to the cost of producing housing, either increase the price of the end housing product, or reduce the land price a developer can pay from the original owner.

We challenge the idea espoused in the Draft Strategy, that new taxes or costs will only affect asset owners through offsetting land values. History has shown that the introduction of such new costs, such as the Growth Areas Infrastructure Charge, discourages and or delays development and leads to significant unintended consequences. Melbourne already has some of the most expensive prices in the world for new housing and the proposals in the Draft Strategy will reduce supply further thereby exacerbating the very issue that we are trying to solve.

The business model supporting residential development reflects significant project risk and high costs of finance that developers must assume to deliver a project, as well as often low margins that are achieved on residential development projects.

The high cost of producing housing does not drive a reduction of underlying land values. In contrast, where the cost of producing housing is high, residential development may no longer be the highest and best use, and the land may continue to be used for another purpose despite a residential zoning. This drives an overall reduction in the supply of new housing.

High taxes, charges and delays through the planning and development approval process reduce housing supply by increasing risk, reducing returns and making certain types of development unfeasible.

The high cost of housing in Victoria pushes lower income segments out of the private buyer and rental market and into the affordable housing market.

If taxes and charges are increased further due to bracket creep or new taxes and charges being introduced, residential development may not be the highest and best use of the land and urban renewal areas and priority precincts may lay dormant.

If the cost of producing housing is so high that the system reduces overall supply, Government will need to play a greater and more deliberate role in funding and supporting affordable and social housing.

Portfolios such as justice, health and education can also be impacted as can the cost of delivering these services to the community if housing needs are not met due to a lack of affordable housing supply.

There is limited opportunity for new levies to be introduced for value capture, priority precincts and affordable housing, without a material impact on the affordability of housing in Victoria. However, these measures cannot afford to be applied retrospectively or in a broad-brushed manner without significant consequences to the overall sector.

The cost of producing new housing in established areas of Melbourne comprise the following costs imposts as a result of state and local government policy, taxes and direct charges:

State Government

- Land tax
- Stamp duty
- Foreign purchaser surcharges on stamp duty and land tax
- Vacant residential land tax
- GST
- Metropolitan Planning Levy
- Statutory utility charges
- Cladding Rectification Levy
- State government infrastructure contributions
- Better Apartment Design Standards

Local Government

- Permit fees and charges including for extensions of permits
- Plan checking and supervision fees
- Local infrastructure contributions including local water authority fees, electrical authority fees, NBN deployment fees
- Council rates
- Open Space Levy
- Passive open space requirements

The role of Government investment

We commend the City of Melbourne's advocacy intent expressed in the Draft Strategy and note the pivotal importance of federal and state Government investment in affordable housing to increase the

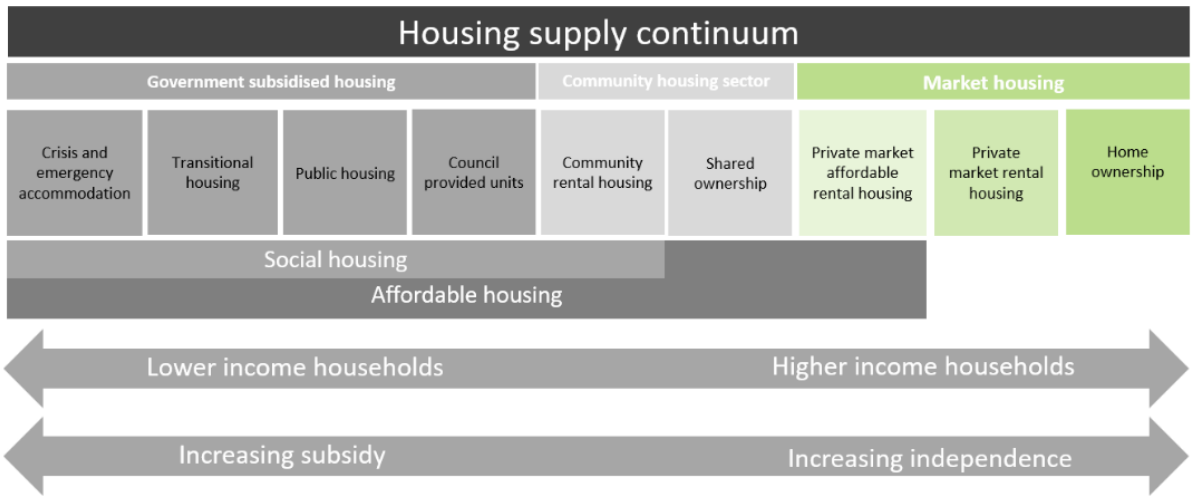
supply and accessibility of affordable housing.

In early 1980s social housing was perceived to be an essential economic infrastructure; commencements were around 15,000 per year (~10% to 15% of new dwellings starts). Later that decade social housing policy morphed to a welfare discussion.

New social housing investment has declined since, except only for the National Rental Assistance Scheme (NRAS) investment in 2009 and 2010 as the Commonwealth sought to mitigate the GFC crisis. Today Commonwealth funding delivers about 2,500 net new homes per annum and this figure continues to fall.

State governments have followed the trend of reducing investment. The Andrews Government is investing to create 1,000 new social housing dwellings in this term, some of which are in the City of Melbourne. However, some estimates are that about 1,700 net new homes are required in Victoria every year to maintain the current 3.5% share of new dwellings. There is not yet any clear long-term vision as to the volume of affordable housing government policy seeks to deliver.

The following diagram produced by the City of Sydney depicts the various forms of housing supply providers and the role of government across the spectrum of housing products:



Source: City of Sydney, 2015, Housing Issues Paper.

Streamlining and improving the planning and development approval system

Federal and state Governments should use their existing tax base to fund and invest in social and affordable housing. At a local level, Councils should work to find significant efficiencies in the planning and development approval process, to modernise the planning scheme framework and to build in market-based incentives to provide affordable housing stock. Where Councils own land, they could choose to include an affordable housing requirement.

Councils need to ensure that any local level policy is compatible with broader state government policy to eliminate any policy conflict and make certain that the planning delivery mechanisms do not restrict or delay the further provision of housing.

Inclusionary zoning is a relatively blunt tool which does not address the needs of all participants in the process of delivering a significant volume of new affordable housing across different market segments.

UDIA Victoria's submission to the Commissioner for Better Regulation as part of the *Planning and Building Approvals Process Review* highlights several key proposals for streamlining the planning and approval system at the local level. We encourage the City of Melbourne to review UDIA Victoria's suggestions here: https://www.udiavic.com.au/getattachment/Policy-Committees/Policy-Submissions/UDIA-RED-TAPE-REVIEW-submission-August-2019-(1).pdf

Market impacts of new taxes, charges and cost imposts resulting from policy changes

UDIA Victoria notes the background work done by SGS Economics and that we have had the opportunity to meet with the City of Melbourne and advisor Marcus Spiller to better understand the thinking and assumptions that underpin the Draft Strategy.

Our analysis and review of the SGS Economic reports, and the underlying assumptions used have led us to form the following view:

- The SGS model is too simplistic and fails to appreciate the full market dynamic and the competitive nature of land acquisition for development purposes;
- SGS Economics have used extremely simplistic assumptions and modelling to justify the role they believe the development sector should play in providing affordable housing dwellings;
- SGS Economic have long been an advocate for inclusionary zoning, and as such, they have not provided a balanced view of the arguments for or against inclusionary zoning, and have relied too heavily upon this strategy as a solution for providing more affordable housing;
- The peer review of SGS Economics work is not available on the City of Melbourne website, and as such, is not able to be validated.

We make the following specific comments relating to the market fundamentals of the property and development industry in response to the SGS Economics report:

- The supply of development sites is not elastic; it is highly constrained. The market does not respond in the way the economic models suggest. New costs and imposts are built into development costs, are passed on to the end consumer and are reimbursed to the developer in the form of retail price increases.
- If the retail housing market does not accept higher end prices, supply will stall, as was seen initially after the GAIC was introduced, as development projects will be shelved until such time as consumers can afford the higher cost of housing.
- Development margin does not and cannot get squeezed. If the market cannot find a suitable margin, the project will not attract necessary investors and bank funding and therefore development will not proceed.
- Most developers are looking at a pipeline of development sites that need replenishment and this process is highly competitive. Sites need to be in suitable locations, and also supported by suitable planning and infrastructure frameworks to make the project attractive to the end user.
- The planning scheme and the planning processes itself puts a lot significant of risk into projects and strong restrictions on much large portions of land that is are otherwise considered developable.
- The market, in reality, does not support the theory that landowners will simply accept a

reduced price for their land, and that a supply of development sites will continue to flow into the pipeline. Instead, landowners are more likely to pursue other asset development strategies – for example, commercial or retail development – or pursue asset refurbishment and leasing strategies, or they simply will not sell their land.

- The notion of a requirement to "gifting" completed dwellings will significantly impact the viability of most development sites and cripple the delivery of new housing supply.

9 July 2020

Joel Twinning
Planning Systems
Department of Environment, Land, Water and Planning

By email: joel.twining@delwp.vic.gov.au

Dear Joel,

UDIA Victoria Submission: Strategic Development Areas Infrastructure Contributions System

The Urban Development Industry of Australia, Victoria Division (UDIA Victoria) is a non-profit advocacy, research and educational organisation supported by a membership of land use and property development organisations, across the private sector and Victoria's public service. We are committed to working with both industry and Government to deliver housing, infrastructure and liveable communities for all Victorians.

UDIA Victoria welcomes the opportunity to provide a submission to the Department of Environment, Land, Water and Planning (DELWP)'s discussion paper on an Infrastructure Contribution Plan System (ICP System) for Strategic Redevelopment Areas (SDAs).

Our key positions are as follows:

1. The Victorian Government should pause the consultation and development of the ICP system for SDAs until the COVID-19 pandemic period has passed;
2. Infrastructure Contributions are a contribution toward local infrastructure and a system for ICPs for SDAs needs to be designed with this principle at the forefront;
3. UDIA Victoria strongly opposes collection of state infrastructure levies through the ICP system that was, is and should remain designed for the collection a contribution toward local infrastructure requirements;
4. Insufficient analysis, impact assessment, research and interrogation has been done to support the proposed ICP system for SDAs and this must be done before a system can proceed;
5. A standardized ICP system for SDAs will be difficult to achieve due to the unique nature of these urbanized, redevelopment precincts or sites;
6. In the meantime, the well-established system of using Section 173 Agreements and Development Contribution Plans should continue to be utilized;
7. The proposed two-tiered system that is proposed presents significant difficulties and does not adhere to the standardization principle;
8. A cap on Supplementary Levy amounts should be introduced for all development settings, including SDAs, to combat exponential rises in charges and housing cost impost from Supplementary Levy items; and
9. A more rigorous, industry supported process for developing this important system is required if

it is to be done properly and effectively to support the local infrastructure needs of Melbourne's Strategic Development Areas into the future.

Impact of COVID-19

The COVID-19 crisis needs to be resolved before any further policy change or cost imposts can be considered. UDIA Victoria is working with the Victorian Government and the Building Victoria's Recovery Taskforce to support the building, construction and development industry through the COVID-19 pandemic period, and to save jobs and grow jobs on the other side.

UDIA Victoria has written to the Minister for Planning asking that the Government consider establishing a moratorium on policy changes and additional costs which would impact the cost of producing new housing, until mid-2021. A copy of this letter is provided at Attachment A.

These including but are not limited to:

State Government

- Any proposal on foot to implement a state-wide Social and Affordable Housing Levy.
- Any proposal for a new infrastructure contribution for strategic redevelopment areas.
- Annual indexation and increase of the Growth Areas Infrastructure Contribution (GAIC).
- Adjustment and Indexation of the Kingston Strategic Environmental Mitigation Levy (EML).
- Better Apartment Design Guideline amendments which are currently the subject of consultation.

Local Government

- Proposals for new design standards and requirements. Councils continue to work on ad hoc planning scheme amendments that apply new local policies to development in their municipalities.
- Proposals for social and affordable housing. More than 40 Councils have various proposals on foot to prepare planning scheme amendments that will support new local policies for social and affordable housing which may include imposing Section 173 Agreements in exchange for development approvals.
- Proposals to increase public open space levies. A number of councils have planning scheme amendments generate proposals to increase open space contributions in established suburbs under the Subdivision Act.

Cost of producing new housing

UDIA Victoria is concerned about the mounting costs of new and increased taxes, charges and regulation that comprise the cost of a new house in Victoria.

Taxes and charges that contribute to the cost of producing housing, either increase the price of the end housing product, or reduce the land price a developer can pay from the original owner.

We challenge the idea that new taxes or costs will only affect asset owners through offsetting land values. History has shown that the introduction of such new costs, such as the Growth Areas Infrastructure Charge, discourages and or delays development and leads to significant unintended

consequences. Melbourne already has some of the most expensive prices in the world for new housing. The high cost of housing in Victoria pushes lower income segments out of the private buyer and rental market and into the affordable housing market.

The business model supporting residential development reflects significant project risk and high costs of finance that developers must assume to deliver a project, as well as often low margins that are achieved on residential development projects.

The high cost of producing housing does not drive a reduction of underlying land values. In contrast, where the cost of producing housing is high, residential development may no longer be the highest and best use, and the land may continue to be used for another purpose despite a residential zoning. This drives an overall reduction in the supply of new housing.

High taxes, charges and delays through the planning and development approval process reduce housing supply by increasing risk, reducing returns and making certain types of development unfeasible.

If taxes and charges are increased further due to bracket creep or new taxes and charges being introduced, residential development may not be the highest and best use of the land and urban renewal areas and priority precincts may lay dormant.

If the cost of producing housing is so high that the system reduces overall supply, Government will need to play a greater and more deliberate role in funding and supporting infrastructure as new areas of Melbourne are developed.

There is limited opportunity for new levies to be introduced for value capture, priority precincts and affordable housing, without a material impact on the affordability of housing in Victoria. These measures cannot afford to be applied retrospectively or in a broad-brushed manner without significant consequences to the overall sector.

The cost of producing new housing in established areas of Melbourne comprise the following costs imposts as a result of state and local government policy, taxes and direct charges:

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- Council rates
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Principles of an ICP System

The concept of an ICP System for SDAs was first proposed by the Standard Development Contributions Advisory Committee in 2012 and 2013. Since then, numerous iterations of the System have been workshopped, and a commitment has been made by the Andrews Government to deliver an ICP System for SDAs including Fishermans Bend.

The Standard Development Contributions Advisory Committee's two key reports – 'Setting the Framework' (Dec 2012) and 'Setting the Levies' (May 2013) – outlined the following key principles:

- Need: The planning unit across which a charge is levied must have a demonstrated need for the proposed infrastructure. The degree and level of detail to which this principle must be demonstrated will inevitably vary according to the development setting and the nature of the infrastructure needs which exist in that setting.
- Nexus: There must be a reasonable nexus between the infrastructure that is levied for, and the planning unit across which it is intended to impose the levy. It may not be necessary to demonstrate that an individual development causes the need for the infrastructure, but that it forms part of a wider planning unit that will need the social and physical infrastructure. How need and nexus are demonstrated in a development setting with a standard charge is addressed further in this report.
- Apportionment: Levies should be fair and represent a reasonable apportionment of the cost of delivering infrastructure, having regard to the quantum of development and its likely use as a percentage of the overall use of the facility. The concept of 'user pays' underpins this principle but in the context of overall metropolitan development over time and complex usage patterns, this is a difficult concept to operationalise fairly or precisely.
- Simple, flexible, provide certainty and be fair: Fairness has the following dimensions:
    - A significant contribution by new residents to the basic and essential infrastructure that they generate a need for;
    - Existing residents in growth areas make a contribution through their rates to infrastructure delivered to address the needs of new residents, but which they are also likely to benefit from;
    - Some contribution through grants and other contribution from the revenue base of the State and Commonwealth governments for infrastructure that is provided State and

Australia wide;

- New residents pay a contribution over time through their rates for some of the infrastructure they require; and
- Fairness is a matter of judgment and not a matter of objective assessment.

Need for Solid Policy Development

UDIA Victoria has broadly supported the reform of local development contributions as they apply to Melbourne's Greenfield Precinct Structure Plan (PSP) areas. The ICP System designed for Greenfield areas was done so as to solve well-defined and agreed problems. All stakeholders agreed that the Development Contribution Plan system needed to be overhauled. Despite this, the reformed ICP System has proven complex in the Greenfield areas and further improvements and refinements are necessary to ensure the principles of need, nexus, apportionment and fairness are indeed achieved.

Our most recent submission regarding the Greenfield ICP System identified further important changes that are required, some requiring legislative refinements. This submission is included at Attachment B.

We are concerned that, unlike the Greenfield ICP System, the work to support the system's development for the Strategic Development Areas has not been done. The supporting research by Urban Enterprise is dated and new analysis about the potential impact of costs needs to be done to properly support the proposed policy approach.

Considerable work was undertaken by the Government, Councils and the industry to devise the original ICP concept, and to establish the details of the Greenfield System. There were many years' worth of Development Contributions Plans (DCPs) to test, analyze and interrogate to demonstrate the likely charging outcomes for the new system. Years of data was available and carefully scrutinized. Transport, Community, Recreation and other items, were assessed across many Greenfield ICPs. The information was shared with industry and we participated in numerous forums and considered discussions. This comprehensive process based on research and analysis built the case for the reform and formed a broad consensus between the stakeholder groups.

We have very carefully considered the material provided by DELWP and considered the application of an ICP system for SDAs and have attended a meeting of the Industry Reference Group. We have consulted our most experienced members and their advisors around the proposals. But we are yet to sight a working model that would show how an ICP, as now proposed, would work for an SDA. We are yet to see detailed analysis of existing or proposed precincts.

The proposals provided by DELWP around allowable items and supplementary levies are very broad and loose. There is very little structure to how the proposal would work and what infrastructure, in a more detailed sense, would be included. This will create great uncertainty for investors and developers.

More detailed work has to be done by in order to fully understand the impact of the proposed System and must be a pre-requisite for further industry consultation.

Our view is that at the very least the DELWP should demonstrate, with perhaps half a dozen fully worked examples, how the ICP would be applied, in a complete sense. This would we think demonstrate the issues we are describing, in detail. This should have been done and presented to stakeholders.

Unlike greenfield areas which are more consistent, the strategic redevelopment areas are diverse, their immediate settings are diverse, and the planned developments vary considerably, as does their likely

timing. Each site has its own bespoke needs. One site might need a road traffic network upgrade, where another site may have good traffic access and may need a new major tram stop or bus prioritisation lanes. Each site will have very different requirements.

Development can be quite variable and the market for different development forms is not as predictable as greenfield areas. A large mixed-use development could include a range of development types. The demand for such buildings can vary over time, making forecasting complex. This work would need to be carried out for each strategic redevelopment area, in concert with structure planning work.

Unlike in the greenfield settings, in almost all cases considerable infrastructure existing in the strategic redevelopment areas. This is one of the key tenants of urban consolidation policy – for many decades. Government policy over generations has encouraged redevelopment to occur – as the infrastructure costs to Government are less.

The Standard Development Contributions Ministerial Advisory Committee focused more on the greenfield areas and is nearly a decade old. UDIA Victoria recommends that a new process is established to properly research, interrogate and assess an ICP System for SDAs, in partnership with the urban development industry.

Please contact me directly at danni@udiavic.com.au to arrange a suitable time to do so.

Yours sincerely

Danni Hunter
Chief Executive Officer

Urban Development Institute Australia (Victoria)
Level 4, 437 St Kilda Road, Melbourne, 3004
M. 0400 230 787
E. danni@udiavic.com.au

28 April 2020

The Hon. Richard Wynne
Minister for Planning

By email: Richard.wynne@parliament.vic.gov.au

Dear Minister

COVID-19 – Temporary Moratorium on Residential Development Levies and Policy Changes

The Urban Development Industry of Australia, Victoria Division (UDIA Victoria) is a non-profit advocacy, research and educational organisation supported by a membership of land use and property development organisations, across the private sector and Victoria's public service. We are committed to working with both industry and Government to deliver housing, infrastructure and liveable communities for all Victorians.

UDIA Victoria welcomes the opportunity to work with the Andrews Government to support the residential development industry during this time. Further to our previous correspondence regarding our COVID-19 Action Plan and shovel ready projects, we are seeking your support to enable industry to continue to deliver residential projects during these unprecedented circumstances.

Significant risks are emerging as the Stage 3 lockdown continues and will remain even if Victoria reverts back to Stage 1 and 2 lockdown measures. These include:

- A good portion of the current residential construction activity was generated from property sales which occurred over the past two years. Following a period of historically lower activity due to several factors, sales had only recently started to build again.
- Now COVID-19 has crushed buyer confidence and access to finance, and new home sales have dropped up to 90%.
- These low sales volumes will flow through to reduced civil and home building construction activity, which is likely to result in thousands of jobs being lost over the coming months.
- Residential property and land sales - which drive construction - may be soft for some time.
- Immigration has been the single biggest driver of residential market sales in recent years. For obvious reasons, immigration has ceased and may not normalise for some time. Overseas student intake change will be a second factor that will impact some markets.
- There is a risk that when buyer confidence starts to recover, the impact of the stalled immigration will be felt, which will mean residential markets make take an extra 12 to 18 months to recover.

In response to these risks, we seek your urgent support to impose a moratorium on proposed new or amended fees, levies and taxes (Local and State Government level) or planning scheme amendments that will increase the cost of residential development, until 30 June 2021.

Local Government Imposts

There are currently various proposals for fees, strategies, policies or planning scheme amendments at different stages of consultation and implementation. These all serve to increase development costs and the cost of delivering new residential land and dwellings.

Examples of these proposed or impending charges and policies include:

- **Proposals to increase public open space levies.** A number of councils have planning scheme amendments proposal to increase open space contributions in established suburbs under the Subdivision Act. As an example, Amendment C186 to Darebin Planning Scheme proposes to double the public open space contribution on development to 10%.
- **Proposals for social and affordable housing**. We understand that more than 40 Councils have various proposals on foot to prepare planning scheme amendments that will support new local policies for social and affordable housing which may include imposing Section 173 Agreements in exchange for development approvals.

  The most significant known proposal is the **Draft Affordable Housing Strategy for the City of Melbourne,** which is seeking to phase in a requirement that developers must gift 10% of new housing stock at no cost for affordable housing. This would decimate the residential market in the City of Melbourne.

  Given you are considering recommendations from the Ministerial Advisory Committee for Affordable Housing for a state policy approach, we urge you to put a moratorium on approving any local planning scheme amendments of this nature.

  When the economy recovers and the residential market normalises, a State mandated standard should be enacted to provide certainty across Victoria. We will write to you separately about this issue in the near future.
- Proposals for **new design standards and requirements**. Councils continue to work on ad hoc planning scheme amendments that apply new controls, requirements and local policies to development in their municipalities.

  We request you to enact a moratorium on approving any planning scheme amendments during this time that will increase the cost of delivering new residential land and dwellings to market.

State Government Imposts

State agencies from time to time progressively review requirements, standards and charges. We urge you to set aside all of these processes until the Victorian economy and residential market normalises. Examples of proposals include:

- Any proposal on foot to implement a state-wide Social and Affordable Housing Levy.
- Any proposal for a new infrastructure contribution for strategic redevelopment areas.
- Annual indexation and increase of the Growth Areas Infrastructure Contribution (GAIC).
- Adjustment and Indexation of the Melbourne Strategic Environmental Mitigation Levy (EML).
- Better Apartment Design Guideline amendments which are currently the subject of

consultation.

There may well be more proposals being considered within government that we are not aware of yet.

We welcome the Government's decision to delay implementation of the Environmental Protection Authority Regulations 2020 until 1 July 2021 and note our specific concerns with respect to the changes to the classification of fill material as industrial waste which will immediately increase costs of development.

Your support to enact a moratorium on any of the issues noted will reassure industry and provide us with some certainty, at least for a few years, on costs.

The state of Victoria is facing uncharted territory and we recognise the situation is changing daily. We believe it is critical for industry to work closely with State and Local Governments to ensure the residential development sector is well placed to contribute to the Victorian economy when the situation normalises and work ramps up again.

Please contact me directly at danni@udiavic.com.au to arrange a suitable time to do so.

Yours sincerely

Danni Hunter
Chief Executive Officer

Urban Development Institute Australia (Victoria)
Level 4, 437 St Kilda Road, Melbourne, 3004

P. 03 9832 9600

E. danni@udiavic.com.au

February 2020

UDIA Victoria response:

Metropolitan Melbourne Greenfield Growth Areas Infrastructure Contribution Plan Review Recommendations for the VPA (Mesh, 4 February 2020)

Introduction

The Mesh report is a sound document with well-reasoned discussion and recommendations. UDIA Victoria supports most of the recommendations, however we do seek some important modifications. We have also included some additional submissions not couched by Mesh which will improve Infrastructure Contribution Plans (ICPs).

Response to Mesh Recommendations

Land Valuation Methodology (R1 to R3)

1. **R1 is supported**. We agree that R1 introduces necessary refinements to the site-specific land valuation methodology to guard against inflated land values. These refinements ensure that inner public purpose land is valued on a reasonable basis and will reduce typical land equalisation charges by 10% to 15%.
2. **R2 is supported**. We agree that it is not appropriate to make the land valuation changes retrospective. Despite the attraction of a single system, the existing approved ICPs have been through a lengthy process and have allowed planning permits, sales and construction to proceed. If the changes were retrospective affected development projects would stall, impacting housing supply.
3. **R3 is supported**. This makes a consequential recommendation to adjust the Ministerial Direction to clearly reflect R2.

   While not addressed in the Mesh recommendations around land valuations, we urge the Government to:

   - Make land valuation reports public when the ICP is exhibited. There is no reason for the valuations to be considered confidential. We feel this is a principal that should be legislated.
   - Provide any party, including 'under providers', with the opportunity to make submissions around land valuations – recognising that these will be determined by the Valuer General rather than through a planning panel process.

   These changes would ensure natural justice and transparency and allow under providers to challenge any inflated land values to ensure they are not overcharged. This is important as once the ICP is approved the values are locked in except for indexation and because Public Land Equalisation Methodology (PLEM) charges can be significant. This also ensures ICPs are not opaque and will boost confidence in the process.

Supplementary Levy Criteria and Use (R4 to R7)

4. **R4 is supported, with modification**. We agree that the planning authority should be required to document how they have addressed the supplementary levy criteria. However, we submit that this documentation should occur in the Explanatory Report which is available when the Amendment is exhibited. The Part A submission timing proposed is too late to be helpful for persons preparing submissions to the amendment. The Part A submission can then elaborate as required.

5. **R5 is supported with modification.** We support the proposed assessment process and criteria which emphasise the need for the planning authority to identify potential savings in project scope to avoid the imposition of a supplementary levy. This would be a significant improvement to the process.

   The UDIA proposes one modification – the reference to PSP and ICP preparation costs (refer R6) should be a separate standard levy being 1% of the standard monetary contribution.

6. **R6 is supported with modification**. Our members already routinely fund PSP preparation costs through a standard VPA funding agreement. Presently these costs cannot be recouped by the developer. This means that non fundees get a free ride – which is plainly unfair. R6 ensures that the PSP preparation costs can be offset against the ICP by the funder when they develop their land. It also ensures that all developers pay their share of the PSP preparation costs.

   However, the UDIA requests several modifications:

   - A new separate standard levy should be created for 'PSP preparation'. The levy should be struck at 1% of the standard monetary component. This way the plan preparation (PSP and ICP) cost will be separate, removing argument and concern from Councils that PSP costs might trigger a supplementary levy. A separate standard levy is also desirable as it separates what will usually be a Council managed standard levy for roads and community / recreation items from the plan preparation costs which would normally be instigated by the VPA.

   - Council's should be encouraged or even required to credit the PSP preparation costs up front by moving funds between the different levy buckets (plan preparation, transport etc). This can ensure that the fundee receives a credit for the PSP costs in the first stages of their development or at least within their project timeframe. The risk otherwise is that fundees are not paid out until the completion of development within the PSP area which could be 25 years after the PSP costs are funded. Early credit is reasonable as the PSP preparation costs which could be $1-$2mn are funded up front by the developer and should be reimbursed early as the project is complete.

7. **R7 is supported.** Each component, including the PSP preparation costs would be considered in the 5-year review.

Standard Transport Levy Rate (R8 to R9)

8. **R8 is supported.** We strongly support this recommendation. This is especially important as the new criteria to be implemented through R5 should see the number and value of supplementary levies reduce. It would be premature for the existing transport charge rates to be reviewed now. This also would allow additional time and experience in implementation costs associated with the various

standard costs and templates which will provide for a more considered review process. We also point out that there should be less risk of cost overrun in future as each project is scoped in detail, is indexed and incudes 15% contingency.

9. R9 is supported. We strongly support this recommendation. The new criteria for imposition of a supplementary levy will assist to reinforce the principles that ICPs are not expected to be full cost recovery mechanisms.

General Direction Review (R10 to R11)

10. R10 is supported with modification. We support the changes to the Ministerial Direction provided changes are made as per our submissions regarding R5 and R6 relating to the PSP preparation levy.

    The other modifications we request are:

    - We submit that the separate walking and cycling infrastructure that may now be included separate to arterial roads and intersections should only include 'essential links'. This recognises that Council or the Growth Area Infrastructure Contribution (GAIC) should still fund major links between communities or to other areas outside the PSP. Without this clarification there is a risk that Council's may seek to include large cycle projects that provide benefits to the wider network in ICPs. Council may also seek elaborate pedestrian bridges at close intervals which are unreasonable, and which will drive up costs.
    - We agree that a 1.75m2 culvert for a pedestrian crossing may lead to unsafe narrow, dark pedestrian tunnels. However, the criteria should be tempered to allow for culverts to be fit for purpose. A specific measurement is not required. If one is included it should measure between 5m2 and 10m2, rather than introduce new 10m2 minimum dimension with no supporting evidence and without an understanding of the cost implications.
    - We do not support funding for rail grade separations, including cycle / pedestrian culverts of any size to be included in ICPs. These should be funded from other sources, like the GAIC. It should not be possible to create a supplementary levy to fund these items. If they don't fit in the Standard Levy, then they should not be permissible.
    - We agree that exclusion of land for an indoor recreation facility is an oversight and has formed a standard part of the former Development Contribution Plan (DCP) process prior to the introduction of the ICP system.
    - We strongly support inclusion of the costs of each allowable item in the ICP. This will provide a sound basis for the implementation phase. This will provide improved signalling to developers around expectations of the broad scope of each project.

    We also submit that the Government should legislate to require Council's, separate to the ICP, to:

    - Make a scoping sheet for every ICP project available to the public, including the estimated cost of each item.

- Prepare an annual report to Council providing an implementation strategy, including priorities, for the ICP.
- Provide for Council to advertise the draft implementation and make the final report public.

These modifications will provide for a transparent implementation process and provide clear signals to developers around likely timing of ICP credits which can be built into project cashflows. Requiring a strong implementation framework from Councils is not unreasonable given the ICPs will collectively deliver tens of billions of dollars of land and infrastructure – they need a corresponding level of implementation rigor. This approach will also ensure probity and reduce likelihood for opaque decisions.

11. **R11 is supported.** Industry and Council communication is paramount.

Impact of Changing Government Policy (R12 to R14)

12. **R12 is supported.** There needs to be stability in the ICP charging system within the 5-year review periods. It is true that Government policy around infrastructure scope changes from time to time. However, these changes tend to happen slowly, the consequences take time to fully emerge and implementation is usually progressive. Government policy changes should be picked up in the 5-year review process.

    The three-year-old kindergarten changes are an example of a Government policy change. In that case the State Government allocated funds to upgrade kinder facilities in the established and regional areas with a view to accommodating the three-year-old kinder policy changes. Government, not future homeowners, should cover increased costs arising from new policy.

    Programming and design and delivery efficiencies (including multi-storey community and school facilities) should be explored to minimise any additional capital cost requirements to fulfil the policy commitment. DET policy intent for early learning provision on primary school sites and shared facilities, and the opportunities for the VSBA to address any deemed infrastructure shortfall in their delivery program.

    Increasing ICPs should be a last resort and not the first point of call.

13. **R13 is supported.** Per discussion around R12.
14. **R14 is supported.** Per discussion around R12.

Planning and Environment Act Related Matters (R15 and R16)

15. **R15 is supported.** This is a very important change. It was industry's expectation that this was a cornerstone of the new system. We were surprised when the ICP legislation did not allow for pooling between land and infrastructure. This change will deliver vast improvements in ICP project implementation.

16. **R16 is supported.** The VPA should create a standard expectation around funds transfer between the collecting agency and development agency. This could be written into the ICP template and varied where necessary, for example if the Council and another development agency agreed on an alternative arrangement. As per our submission on R6, the Council should credit the PSP preparation costs upfront for the relevant developers so that it is refunded before their project is complete.

Early Acquisition of Land (R17 to R20)

17. **R17 is supported.** This should occur as a matter of course when every PSP and ICP is prepared. This would greatly assist in the smooth implementation of greenfield land development and infrastructure delivery. The industry has understood that there would be no need for a PAO under the new system, however, that expectation did not flow through to the legislation.
18. **R18 is supported**. As per comment on R17.
19. **R19 is supported.** As per comment on R18.
20. **R20 is supported.** In addition to application of a PAO, it is already possible under s36 of the Subdivision Act for developers to compulsorily acquire an easement that is essential for the orderly and economic development of land. This can be a lengthy process. It may be possible for an amendment to be made to the relevant legislation so that developers can acquire inner public purposes land in a straight-forward process through the Subdivision Act and in accordance with the relevant ICP land at the relevant PLEM land value. Equally, it should be straight forward for Councils to do the same under a new head of power for Councils to take the land without delay and to the value set in the ICP.

Implementation Related Matters (R21 and R22)

21. **R21 is supported.** We would reinforce that one of the fundamental principles of the DCP and ICP systems for decades has been that it is not a full cost recovery system. Council have other funding sources at their disposal and the State also assists from time to time. Any review of the recreation and community charge should not result in major increases to the charge and there should be no ability to have a supplementary levy for these projects.
22. **R21 is supported.**

The attachment provides some further comment on the Ministerial Direction.

Attachment – Comment on Ministerial Direction regarding ICPs

Table 4: Transport construction supplementary levy allowable items

Supplementary levy allowable item Criteria for applying a supplementary levy	***Supplementary levy allowable item Criteria for applying a supplementary levy***	UDIA Victoria comment
Arterial roads *This includes:* *• upgrades to existing local roads to arterial road standards; and* *• new arterial roads.*	*At least one of the following apply:* *• The Precinct Structure Plan or equivalent strategic plan requires:* *• arterial road spacing above the standard set out in Table 3; or* *• the interim construction of two through lanes in each direction.* *• Construction costs of the council arterial road cannot be wholly or partially funded from the standard levy because:* *• of the topographical, geographical, environmental or other physical conditions of the land; or*	<u>Design standards</u> Longstanding apportionment principles must continue to apply. If there is a need for an arterial road larger or more frequent than the standard in Table 3 (Standard allowable items), then in order for the supplementary levy to be triggered, it must be demonstrated that the additional demand is being generated entirely by the new PSP. For example, in Minta Farm, demand for the upgraded arterial road standard was created by the surrounding area, rather than by development within the PSP area. In such examples, alternative funding sources should be identified, or costs apportioned.

Supplementary levy allowable item Criteria for applying a supplementary levy	***Supplementary levy allowable item Criteria for applying a supplementary levy***	UDIA Victoria comment
	• *the road is designed to primarily service industrial development; or* • *the area of the precinct in net developable hectares is limited.*	
Intersections with council and declared State arterial roads *This includes:* • *arterial and arterial road intersections; and* • *arterial and connector road intersections.*	*At least one of the following apply:* • *The Precinct Structure Plan or equivalent strategic plan requires:* • additional number of intersections above the standard set out in Table 3; or • intersection design requirements above the standard set out in Table 3. *Construction costs of the intersections cannot be wholly or partially funded from the standard levy because:* • of the topographical, geographical, environmental or other physical conditions of the land; or	We note that the realities of land availability must be considered when determining intersection design, and what constitutes creditable works. Flexibility around staging of works should occur, especially when the stages provide for medium term traffic capacity. This is another reason to facilitate developers or Councils top take land as per the ICP to facilitate development.

Supplementary levy allowable item Criteria for applying a supplementary levy	***Supplementary levy allowable item Criteria for applying a supplementary levy***	UDIA Victoria comment
	• the road is designed to primarily service industrial development; or • the area of the precinct in net developable hectares is limited.	
Road bridges (including rail overpasses)	*The constructions costs of the bridge cannot be wholly or partially funded from the standard levy.* *The bridge forms part of the council arterial road network.*	Rail and Freeway overpasses – road and ped/cycle - are higher order items that should be eligible for GAIC funding and for GAIC – WIK agreements.
Pedestrian bridges and accessways	*The constructions costs of the pedestrian bridge or accessway cannot be wholly or partially funded from the standard levy.* *The pedestrian bridge or accessway is required to provide access across a railway, arterial road, waterway corridor, major easement or other major obstacle.*	There are currently items that should be considered higher order infrastructure therefore appropriately funded by GAIC rather than ICPs – such as overpasses and pedestrian bridges to rail and freeways. Recent examples of this include but are not limited to the following: - Donnybrook-Woodstock ICP: Cameron Street Bridge – railway overpass in ($22million project adding $11,000/NDHa)

Supplementary levy allowable item Criteria for applying a supplementary levy	***Supplementary levy allowable item Criteria for applying a supplementary levy***	UDIA Victoria comment
		- Mt Atkinson & Tarneit Plains ICP: Hopkins Road Level Crossing upgrade at Melbourne-Ballarat rail corridor $938,000 - Plumpton & Kororoit ICP: $7.7m Ped/Cycle bridge over Western Freeway Alternative funding sources for these items must be identified (and committed to) during the PSP stage. -
Major culverts	*The constructions costs of the major culvert cannot be wholly or partially funded from the standard levy. The internal cross-sectional area of the culvert is at least 1.75 square metres.*	Support the increase of the cross section area to '5 to 10 square metres".

Table 5: Other supplementary levy allowable items

Supplementary levy allowable item Criteria for applying a supplementary levy	***Supplementary levy allowable item Criteria for applying a supplementary levy***	UDIA Victoria comment
Other local works, services or facilities	• *The item is essential to the development of the area;* • *The item is not listed as a standard levy allowable item; and* • *The Minister agrees to the item being funded from a supplementary levy.*	This provision is vague and should be deleted.

Early delivery of works, services or facilities	*The early delivery of the item is essential to the orderly development of the area; and*
	• *The financing costs are:*
	  • *incurred by the development agency responsible for providing the item; and*
	  • *associated with the early delivery of the item which is listed as a standard levy allowable item or a supplementary levy allowable item; or*
		Financing costs for State agencies should not be eligible for supplementary levies.
		
		The role of the development industry in delivering local infrastructure under works in kind agreements must be acknowledged.
		
		Financing costs should only be considered where a Council has a seriously entertained and well defined proposal and has passed a

Supplementary levy allowable item Criteria for applying a supplementary levy	***Supplementary levy allowable item Criteria for applying a supplementary levy***	UDIA Victoria comment
	• *associated with the early acquisition of public purpose land referred to in section 46GV(8) of the Act which is required for the early delivery of the item.*	resolution to borrow funds to finance a project.
Intersections with council local roads	*The intersection is on or adjoins land in fragmented ownership.*	

Supplementary levy allowable item Criteria for applying a supplementary levy	***Supplementary levy allowable item Criteria for applying a supplementary levy***	UDIA Victoria comment
Local or collector roads; *• Local road or pedestrian bridges; or* *• Local pedestrian accessways.*	*• The item, normally provided by a developer to develop the land for urban purposes, is on or adjoins land in fragmented ownership;* *• The fragmented land ownership makes the delivery of the item by the developer difficult;* *• The item is essential to the orderly development of the area;* *• The relevant municipal council has agreed to be the development agency for the item; and* *• The cost of the item can be fairly levied amongst the developers who will benefit from the delivery of the item.*	Only benefiting owners within the fragmented area should contribute to such local roads or other facilities.

Table 6: State infrastructure supplementary levy allowable items

Note: In accordance with 46GH of the P&E Act, this only applies in GAIC areas where the Council is the development agency

Supplementary levy allowable item Criteria for applying a supplementary levy		*Supplementary levy allowable item Criteria for applying a supplementary levy*	UDIA Comment
Transport infrastructure	*Construction of declared State roads, including intersections and bridges, and public transport infrastructure*	*The infrastructure is identified in a growth corridor plan or equivalent State or local strategic plan adopted by a Minister, government department or a planning authority;* • *The development generates a need for the State infrastructure;* • *The provision of State infrastructure through the infrastructure contributions plan complies with section 46GH of the Act; and* • *The State or State government agency has agreed to be the development agency for the infrastructure item.*	Even where Councils are the Development Agency, UDIA Victoria considers that State infrastructure must not be funded by ICPs in GAIC areas.
Community facilities	*Construction of state education, health or emergency facilities*		
Other State works, services or facilities	*Construction of infrastructure that is essential to the development of the area*		

16 December 2020

Environment Protection Authority Victoria
urbanstormwaterbpem@epa.vic.gov.au

Dear Urban Stormwater Team

RE: Draft Urban Stormwater Guidance (Publication 1739)

Thank you for the opportunity to comment on the Draft Urban Stormwater Guidance (publication 1739). Congratulations on releasing this important contribution to policy and to the knowledge base for urban stormwater management. This document recognises the science with respect to the impact of stormwater on waterways and goes a long way to progress our collective journey in protecting the values present in our waterways. We have identified some areas of the document where we feel the guidelines can be enhanced to better achieve their intended long-term outcomes.

Due to the fast pace of urban growth and the high value of waterways in the Western Water region, this guidance is expected to have a significant positive impact protecting environmental health and overall liveability. The Western Water service area includes the headwaters of the Maribyrnong River, and much of the Werribee River catchment. Waterway health is a key priority for Western Water as we rely on these waterways to provide drinking water for our customers, and for discharging recycled water from our sewage treatment plants that is not able to be used for irrigation or other beneficial uses. Strong regulations are in place to manage treated sewerage and protect waterways. This draft Urban Stormwater Guidance begins the process of addressing the significant impact urban stormwater volume has on waterway degradation, currently not covered by existing regulations.

Western Water works closely with Melbourne Water, local councils and developers to plan for and implement effective water management systems across new urban developments, and we have issued a guidance document to support positive integrated water management outcomes for developments (https://www.westernwater.com.au/files/assets/public/documents/land-development/iwm-developer-guidance/iwm-developers-guidance.pdf). Western Water requires developers to prepare a development scale IWM plan that outlines how the new development will best manage all forms of water, including stormwater. The Draft Urban Stormwater Guidance sets new quantitative targets for developments that will inform developers' water management infrastructure designs from inclusion in these Developer IWM Plans, resulting in more sustainable and liveable urban areas. This aligns with and supports Western Water's strategic direction.

The Draft Urban Stormwater Guidance is a positive first step, however it does not yet reflect the work, in some cases quite advanced, that water corporations have been leading in this space, supported by the Integrated Water Management (IWM) Framework for Victoria. It is understood the Guidance audience is developers, and there is reference to early engagement with water corporations, however the collaborative nature, scope and extent of this engagement could be strengthened and more explicit. Western Water seeks to partner with developers in exploring water cycle management options and supports collaborative solutions. Furthermore, stormwater management solutions are funded by the developer, with costs passed on to the customers. The collaborative planning by water corporations, local councils and developers using IWM principles may realise greater overall benefits, with other authorities potentially willing to contribute financially to achieve these outcomes. Solution development and implementation is better realised through a collaborative approach, with a

Western Water ABN 67 433 835 375
36 Macedon Street Sunbury Victoria 3429
PO Box 2371 Sunbury DC Victoria 3429
T 03 9218 5400 • **F** 03 9218 5444 • **E** mail@WesternWater.com.au
WesternWater.com.au

holistic view of the catchment or regional area as compared to the limited prospects within a single development. This would result in a greater range of solutions, improved economies of scale and broader multiple benefits.

A significant unknown to implementation of the Guidance is the "reasonably practicable" threshold. If developers are expected to design and deliver all the outcomes on their own, this threshold may be interpreted as quite low. However, if other authorities are involved, different solutions may be considered, which could strengthen what is deemed as "reasonably practicable". For example, options to manage stormwater in the high priority waterway area of Sunbury have been explored over several years by Western Water, Melbourne Water and Hume City Council, with extensive community engagement. In this case, a centralised stormwater harvesting solution is being pursued, which is much more cost effective and beneficial than what is currently outlined in the draft guidance, which focus solely on lot and development scale solutions. Similarly, Western Water is also exploring regional scale water management solutions through the Bacchus Marsh and Melton growth corridor, and how these may interface with other recycled water management options such as environmental offsets. These solutions will likely be significantly more cost effective, and suited to the local conditions, than those proposed in the draft guidance.

Specifically, regarding the examples provided from page 10 onwards, some details are outlined in the description, however others are omitted. These other details could provide useful further context to understand the relevance of the examples. Additional metrics that could be included are:

- total area
- the number of lots
- % garden area
- soil permeability.

Inclusion of some or all of these metrics would support the examples, demonstrating how they are able to achieve the outcomes intended. Furthermore, inclusion of a regional scale, multi-development solution, would also be useful, to showcase the value and significant thinking and work being undertaken by water corporations.

Finally, the IWM Forums are in the process of developing catchment scale performance targets. This is a great opportunity to align the guidance to enable the delivery of such targets, once agreed.

Western Water will be integrating with City West Water to form a new entity called Greater Western Water on 1 July, 2021 servicing a substantial footprint encompassing Melbourne's CBD and north-west regional towns. We welcome the ongoing dialogue and exploring how we can continue to work together to achieve a positive environmental legacy for future generations. Please contact Nigel Corby on nigel.corby@westernwater.com.au or 0423 606 814 for further discussion.

Kind Regards

Livia Bonazzi
General Manager Strategy & Innovation

Western Water ABN 67 433 835 375
36 Macedon Street Sunbury Victoria 3429
PO Box 2371 Sunbury DC Victoria 3429
T 03 9218 5400 • **F** 03 9218 5444 • **E** mail@WesternWater.com.au
WesternWater.com.au

MUNICIPAL ASSOCIATION OF VICTORIA

Draft EPA Urban Stormwater Management Guidance

Submission

December 2020

"MAV Submission – Draft EPA Urban Stormwater Management Guidance" has been prepared by the MAV for discussion with member councils, and the State Government on urban stormwater management.

While this paper aims to broadly reflect the views of local government in Victoria, individual councils will also respond to issues specific to, and on behalf of, their communities. The MAV thanks and acknowledges the contribution of those who have provided their comments and advice in the development of this submission.

MUNICIPAL ASSOCIATION OF VICTORIA

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MUNICIPAL ASSOCIATION OF VICTORIA

1 Executive summary

We welcome the release of the EPA's Draft Urban Stormwater Management Guidance and its collation of scientific and technical insights that will enable stormwater management practices to better meet pollution reduction objectives and insights shared across the development, land-use and infrastructure sectors. It is a timely reminder of the urgent need for continued improvements to be made to the way urban stormwater is managed to minimise the risk of harm to human health and the environment, through informed advice.

Predictions that the total area of impervious surfaces will almost double over the next 30 years, and that urban growth is likely to generate 80GL of stormwater every year across Melbourne (equivalent to 32,000 Olympic size swimming pools), are salutary warnings that action and planning on stormwater management now is vital to maintain the liveability of Melbourne and Victoria's regional towns and cities. Increased flood risks to life and property will need to continue to be appropriately mitigated.

A key feature of Victoria's economic recovery from the COVID-19 pandemic will be the significant construction and housing developments being planned over the next few years as a result of Federal and State Government stimulus policies. It remains as important as ever that this new infrastructure has regard for the opportunities water-sensitive urban design creates in reducing heat island effects, maintaining environmental values and utilising all water sources to their maximum potential.

The liveability of local places achieved through increased water sensitive urban design is also critical if towns and cities are to continue to provide places where communities want to live and work, and attract new residents, visitors and other business investors.

Incorporating this document as a statutory requirement in all planning schemes as soon as possible is important to locking in the long-term outcomes from development. Built form lasts for many years, so commencing the consultative steps to replace the current guidance cited in planning schemes now is vital. The current Urban Stormwater Best Practice Environmental Management (BEPM) guidelines have not been updated since 1999.

We also welcome the EPA's clarification that councils' obligations under the SEPP Waters 2018 will continue to operate until 2023, to enable an orderly transition and development of relevant instruments that will assist them manage their General Environmental Duty in their capacity as land and infrastructure managers.

Funding support from DELWP will be required to enable councils, their communities and the development industry meet the imperatives generated by this new 'state of knowledge'.

In respect of the guidance content, we are concerned that one particular proprietary modelling tool is being recommended by EPA. We suggest this reference be removed from this document given there are a range of tools available and there are opportunities for new ones to emerge more quickly than this document is likely to be updated. The guidance document would be more useful if it outlined the ingredients that would be useful to be factored into modelling tools so that users can more easily understand the information being generated.

Significant improvements for stormwater management can be achieved by the actions of many delivering a cumulative large effect. State government support to update and support the ongoing provision of the STORM tool will particularly assist many small-scale landowners consider and demonstrate they are meeting optimal stormwater management requirements when they apply for planning permits.

We provide the following suggestions for changes to the guidance document:

- Clearer articulation of the target audiences and how they can use this document. This will enable greater clarity for the various audiences using the document, including small and large-scale developers and a variety of regulatory authorities and government agencies, including councils, water authorities, the Victorian Planning Authority, Victorian Building Authority, Department of Transport, VicTrack, etc.

- Delete references to specific commercial software modelling offerings in the guidance document, and instead develop protocols outlining what constitutes an appropriate tool for demonstrating compliance with the new Urban Stormwater Management Guidance

Transforming the science collated in this guidance document into action will require supporting actions that will need investment from the Victorian Government if they are to be expedited quickly. These include:

- Immediately commencing the process to incorporate the EPAs urban stormwater guidance into all Victorian planning schemes.

- Providing $10 million for a two-year funding program from 1 July 2021 to support councils review and develop template municipal stormwater management plans, including incorporating sub-catchment and regional scale approaches to enable efficient allocation of management effort and development of the appropriate regulatory instruments that may be required when the SEPP Waters

- Committing to ongoing provision of planning tools by DELWP to assist and expedite small to medium-sized landowners understand how they can meet optimum stormwater management standards from their developments. Upgrading and providing ongoing support for the STORM tool is particularly important in reducing compliance costs for small-scale developments.

We note that a number of our proposed recommendations will be relevant for DELWP as the policy lead rather than EPA. These are identified where relevant.

MUNICIPAL ASSOCIATION OF VICTORIA

2 Introduction

The MAV welcomes the opportunity to provide comments on the EPA Draft Urban Stormwater Management Guidance.

Councils are integrally involved in the management of urban stormwater, with multiple roles and interests in stormwater, including as a:

- *Responsible authority and planning authority*
  Councils issue permits for use and development of land which have to comply with the relevant planning scheme. Planning schemes reference standards in the SEPP Waters and the Best Practice Environmental Management for Urban Stormwater (BPEM). Councils develop and implement local planning policies, such as Environmentally Sustainable Development Local Planning Policies which include water efficiency objectives and requirements.

- *Infrastructure manager of public stormwater assets*
  Sections 198-201 of the Local Government Act 1989 provide authorizing powers for councils to manage public drainage within their municipal area. The 38 councils in the Melbourne Water service area take responsibility for drainage, outfall and stormwater infrastructure under 60 hectares in scale and volume, with Melbourne Water being responsible for assets over 60 hectares.

  Collectively, Victorian councils manage approximately 35,000 kilometres of drainage pipes and 1.4 million stormwater pits with estimated replacement costs being many billions of dollars. Some also manage outfalls directly to Westernport and Port Phillip Bay and oceans. Councils are a road authority under the Road Management Act 2004. They maintain the drainage required to protect the operation of the roads for which they are responsible.

  Under the SEPP Waters councils are required to have stormwater management plans, developed in consultation with water authorities and local communities.

- *Community advocate and public place manager*
  Councils have a significant role in shaping their local communities and creating places that are safe and livable.

The commencement of the new environment protection regime on 1 July 2021 will introduce new Environmental Reference Standards and a new General Environmental Duty (GED) on all land and infrastructure managers not to pollute. The MAV has signaled the importance of the EPA working with councils to consider the transition from the cessation of the urban stormwater SEPP Waters Clauses in 2023, and the replacement statutory instruments that will be required to enable them to manage their GED responsibly and practicably.

This submission builds on comments about urban stormwater which we have provided in the past, including the MAV's responses to the Environment Protection Regulations and other regulatory instruments (2019), Improving Stormwater Management Ministerial Advisory Committee (2018) and Draft SEPP Waters (2018).

3 MAV comments

Victoria's 79 councils are committed to achieving the outcomes that improved management of stormwater can bring for their communities, both from a social, environment and economic perspective. Retaining liveability for Victoria's cities and towns is vital to attracting people to live in metropolitan and regional centres, protecting the environment. Managing stormwater efficiently where actions are most effective will also drive greater levels of efficiency, which in turn reduce costs for residential and business landholders.

The EPA's stormwater management guidance is therefore timely in informing the technical standards that will assist regulators and land-use developers better manage stormwater. Considerable advances in knowledge have occurred since the last Urban Stormwater Best Practice for Environmental Practice was released in 1999, particularly the insights and awareness of the problems flows of water cause. The document's focus on technical standards is also useful, with implementation better dealt with through our powers and instruments.

Melbourne Water's Healthy Waterways Strategy for greater Melbourne suggests that urban growth could generate 80GL of stormwater (equivalent to 32,000 Olympic swimming pools) every year, with these increased flows adding to the scouring, polluting and degradation of the waterways communities rely on for local liveability, tourism and maintenance of the environment and biodiversity.

Despite the short-term reductions in Victoria's population growth in 2020 and 2021 due to the restrictions imposed by the COVID-19 pandemic, Federal and State Budget expectations continue to be that Victoria will experience population growth over the next 50-year period. Projections before COVID-19 were that the population of Melbourne is expected to exceed eight million by 2051[1]. Modelling by DELWP suggests that if this urban growth is accommodated in the same way it has been until now, by 2051 the total area of impervious surfaces and stormwater runoff will almost double[2]. Every time new buildings, roads and carparks are built, the total impervious area increases.

Population and increasing impervious surfaces in urban centres are also increasing in regional Victoria, with its population expected to increase to over 2 million people by 2051.

The cumulative impact of these projections is that committed and urgent attention remains vital to enable Victoria's urban centres accommodate development growth well, while preserving environmental and public health standards.

Stormwater management is complex and diffuse, with the actions of many parties impacting how rainfall flows from impervious surfaces are dealt with, and the scale of the problem generated from pollutants entering drainage systems which spill out water and scour waterways, bays and oceans with the pollutants and debris collected from many sources along the way.

This submission focusses on the role of councils managing urban stormwater as a planning authority, and as a manager of public land supporting activities and towns across the state achieve community connection (parks and gardens, public precincts , footpaths, streets and roads) from infrastructure provided in the public realm. It does not comment on the technical aspects of the guidance, given the reliance of councils on EPA to undertake the detailed investigate and scientific research that will

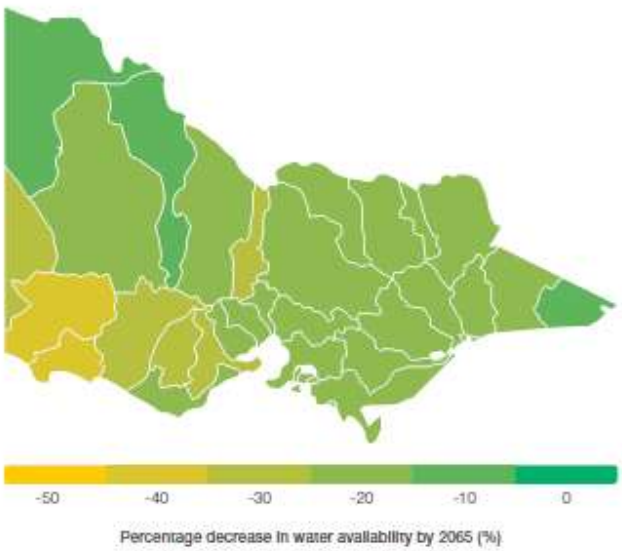
[1] "Victoria in Future 2016 Population and household projections to 2051", DELWP
[2] "Improving Stormwater Management Advisory Committee Final Report", p13

assist regulators and developers take the necessary steps to prevent harm to the environment which are practicable as well as sustainable.

Councils also many manage tens of thousands of kilometres of drainage infrastructure under cities and towns which is the conduit for stormwater flowing away from source, often ending up in waterways, bays and oceans.

The recently released Infrastructure Victoria Draft 30-Year Strategy illustrates the urgency for all parts of the water-cycle system to be managed and utilised effectively now. Figure 2 illustrates the scale of the task across the state, with some regions expected to have declines in water availability of more than 50%. Current projections indicate a 20% decrease in water availability by 2065. Combined with a growing population, water shortages are expected in a range of Victorian settings, with mid-range scenarios seeing shortages in the next 10-20 years.

Figure 2: Water availability scenarios



Source: Hope, P. et al, A Synthesis of Findings from the Victorian Climate Initiative (VicCI), Australian, Bureau of Meteorology, 2017, pp. 37-45.

Source: Infrastructure Victoria Draft 30-Year Strategy, p52

Living Melbourne and the Victorian Planning Authority's draft precinct structure plan guidelines also require efficient use of water resources to green and cool Melbourne and Victoria's other cities and towns. Best practice tools, resources and training will be required for planners, policy makers and practitioners to ensure that widespread and effective WSUD practice is achieved.

A one-size-fits-all approach will not be relevant in all settings. The comments in the following sections focus on recommendations for amendments to be made to the guidance document, the intersection with planning schemes and municipal-scale urban stormwater planning.

3.1 Proposed amendments to the guidance document

Document refinements:
The 'how to use this guide' section would benefit from being clearer about the intended audience and providing clearer markers for how it can be used to inform design and engineering plans. Small to medium-scale developers may find this guidance daunting as currently presented. Provision of tools that enable them to understand what they need to do to meet the standards is vital.

The scenarios would benefit from wording being included which direct developers to relevant water authority and council requirements, as these differ between jurisdictions. Stronger guidance on the need for developers to communicate with local authorities early in the process would be very beneficial to minimise issues that may arise later in the application approval process.

Scenarios should also be developed for other types of developments which will be commonly built over the immediate period, including townhouses, apartments, non-residential and commercial developments.

References to commercial modelling tools:
We question the appropriateness for EPA's guidance to recommend a proprietary tool (eg, Paragraph 3, p7 refers) which has not been through a rigorous industry review or been developed through an industry process. While it may be useful for EPA to provide links to providers who can assist developers consider how they might meet these guidelines by other means, we do not consider that this should be included in EPA's official guidance document.

Instead, we strongly recommend that EPA removes these references in the guidance document itself, and replaces these with an outline of the ingredients developers should be looking for when considering the tools they can use to demonstrate compliance with the new Urban Stormwater Management Guidance. In raising this issue, please note that the MAV is not commenting on the quality of the particular provider; our point is about the endorsement process and apparent promotion of a particular provider in official guidance.

3.2 Status/interaction with planning schemes

We recommend that this document be considered for incorporation into all planning schemes to significantly improve the implementation of measures which can reduce and re-use stormwater. In particular it could be used as the updated reference to Standard A6 and B9 of Clauses 54 and 55 respectively. This change would enable councils to put measures in place in their planning schedules under permeability to require developments to reduce and re-use stormwater.

We note again for the record, in the event that planning schemes are amended, that the definition of stormwater should be revised so that it is the same as that used in the SEPP Waters and the new Environment Reference Standards that will come into effect on 1 July 2021. We acknowledge that while this is outside the scope of this guidance development, it would make sense for definitions to be aligned across regulatory instruments.

Currently planning schemes have a different definition to that used in the SEPP Waters and proposed Environmental Reference standards. We recommend that the definition of stormwater in the proposed Environmental Reference Standards is used as the key reference point. The greater levels of detail

contained in the current planning scheme definition would be better outlined in a Practice Note detailing the specific issues development applications need to have regard for in relation to their management of stormwater.

Developers having regard for this new guidance will be important in having all new developments implement measures as soon as possible. Built structures can last for many years, so the sooner standards are introduced, the better this will be for bringing forward the benefits better management of urban stormwater provides.

State Government supports for small-scale development assessments
Harnessing effective stormwater management treatments by the many small-scale developments will result in meaningful cumulative impact for the water-cycle system as a whole. To facilitate and speed up the opportunities these present, we support DELWP's commitment to support the upgrade and review of the ongoing maintenance of the STORM tool to assist small-scale landowners understand how they can meet stormwater requirements of the planning system. Smaller regional and rural councils would also appreciate the support such a tool this would provide to assist them better consider local permit applications.

Ongoing funding being provided by DELWP would assist expedite this task, and remove the lack of clarity that currently exists about the appropriate provision of this tool. MAV will continue to liaise with DELWP about possible options.

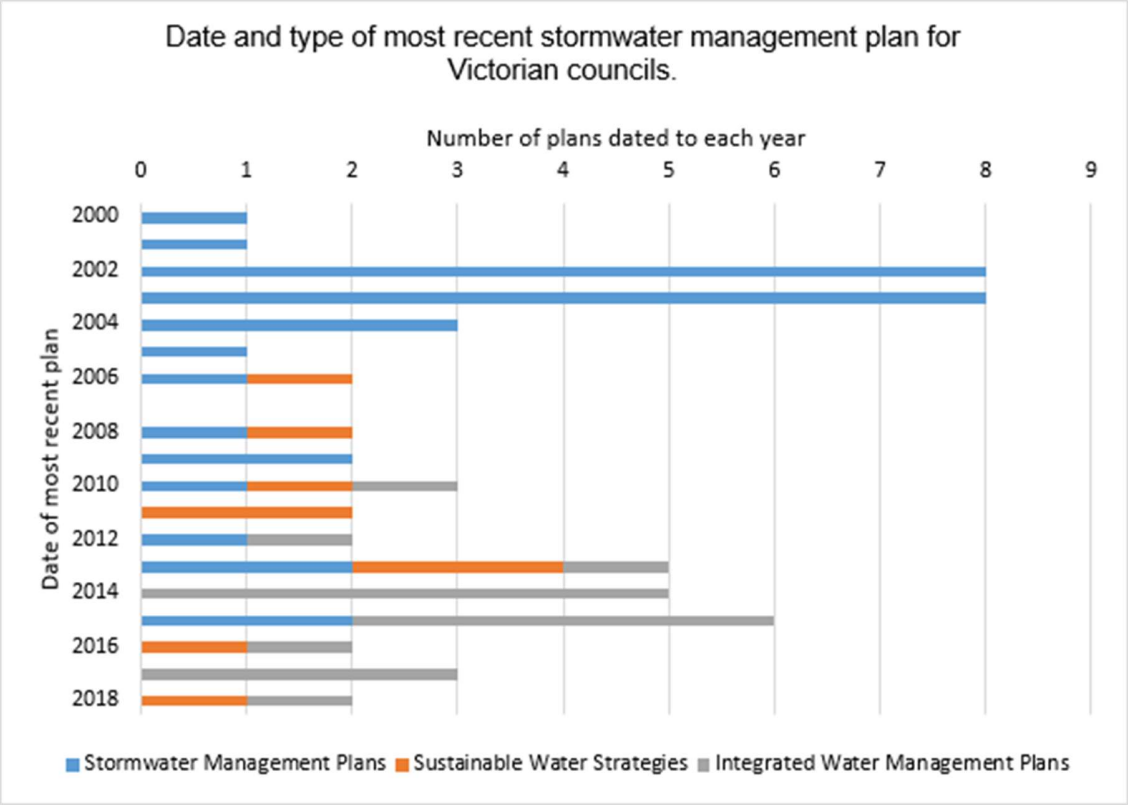
3.3 Municipal-scale urban stormwater management planning

We support the direction the EPA is taking in developing guidance which focusses on technical requirements which land-use developments need to achieve, rather than mixing these with other implementation issues and roles and responsibilities of different agencies. On the assumption that the current BPEM guidelines will eventually be replaced by a hybrid model of EPA guidance and relevant statutory instruments under the new Environment Protection Amendment Act 2018, we take this opportunity to alert the EPA and DELWP that further consideration will be required in 2021 for a municipal stormwater management planning audit and review program.

Currently municipal-scale stormwater planning varies across the state. According to a desk-top review of council websites undertaken by the MAV in 2019, 28 of the 79 Victorian councils have stormwater plans that have not been updated in over ten years. Many more would benefit from being reviewed with an integrated water management lens.

Figure 1 illustrates the diversity of practice across the sector, with a number of councils (mainly in metropolitan Melbourne) having updated and comprehensive integrated water management plans. Many still have stormwater management plans which will have been based on the template plans introduced following the development of the 1999 Urban stormwater best practice environmental management guidelines (BEPM).

Figure 1 - Council stormwater management plan status



Source: MAV desktop review of stormwater and IWM plans available on council websites, June 2019

A funded program would support councils review and develop template municipal stormwater management plans, and provide the opportunity to bring catchment and regional scale approaches to municipal planning. It would also enable consideration for more efficient allocation of management effort and development of the appropriate regulatory instruments. We recommended that $10 million be provided for a two-year funding program from 1 July 2021.

Reviewing stormwater management planning guidance for councils would also enable better alignment to other key targets relating to water quality protection and public health which are contained in other state policy documents, such as Living Melbourne, the Westernport and Port Phillip Bay Environmental Management Plan and the Victorian Marine and Coastal Policy.

MUNICIPAL ASSOCIATION OF VICTORIA

4. Conclusion

MAV welcomes the publication of this draft guidance and having the opportunity to provide comment. Due to capacity limitations imposed by responding to the ongoing COVID-19 emergency, we have not had the opportunity to consult in detail with councils. As a result, we will be seeking to continuing to work with the EPA to improve the management of urban stormwater ongoing, to enable local insights inform the continued development of state-level policies.

We will also welcome collaboration with the EPA about urban stormwater planning at the municipal scale and the necessary subordinate legislation or other instruments that may be required to support councils as they adjust to the new environment protection regime that will commence from 1 July 2021. This will be particularly relevant as the SEPP Waters is phased out and new regulatory instruments explored to enable councils manage their land and infrastructure responsibilities in the period to 2023.

Recommendations from the Melbourne Urban Stormwater Institutional Arrangements Review (60 hectare) (MUSIA) Review considering the delineation of the responsibilities between Melbourne Water and the 38 councils in its service region will also be important to incorporate into this future work program.

Capacity building projects to disseminate technical knowledge and good practices for regional and rural councils continue to be important. We recommend continuation of funding being provided by DELWP for initiatives such as the Clearwater program being available state-wide contribute to greater consistency in approach by councils across the state. They also build peer learning and insights of the benefits water-sensitive urban design and innovations to better manage urban stormwater.

Glenelg Hopkins CMA
PO Box 502
Hamilton Vic 3300

ABN 55 218 240 014

T +61 3 5571 2526
F +61 3 5571 2935
E ghcma@ghcma.vic.gov.au

Environmental Protection Authority Victoria,
200 Victoria St
Carlton 3053
DX210082

To whom it may concern,

Thank you for the opportunity to provide comment on the Draft urban stormwater management guidance.

The Glenelg Hopkins CMA is a statutory authority that facilitates works to protect and enhance the quality and condition of waterways. The Glenelg Hopkins CMA delivers integrated catchment management works in partnership with the community and stakeholders to improve land and waterway health. We welcome any document which strengthens the protection of our urban waterways.

Our comments for the Draft urban stormwater management guidance are as follows:

- **Section 1 – Purpose (pg 4):** The Draft urban stormwater management guidance document states that the guide improves stormwater management by recognizing current science and risks of harm. However, the EPA's Literature review provided with the Draft urban stormwater management guidance states: "*The current BPEM removal targets from urban stormwater (of 80%, 45%, 45% and 70% for TSS, TP, TN and litter loads) were based on previous assessments around the reductions in nitrogen loads required to achieve outcomes in Port Phillip Bay (Port Phillip Bay Environmental Study (CSIRO, 1996)), but there is little evidence in the literature that these are sufficient for protecting stream and public health in urban waterways" (Doc 1919- pg24).* Are these targets being reviewed, or are they still considered best practice?
- **Section 1.2 – Scope (pg 5):** The Draft urban stormwater management guidance mentions that runoff from rural land is not covered in the document but is covered in the Victorian Rural Drainage Strategy. While this is reasonable, it might be beneficial to acknowledge that some risks would be compounding in rivers which flow through both agricultural and urban landscapes.
- **Section 2.1 – Assess risk: factors to consider (pg 7):** The Draft urban stormwater management guidance document when referring to the WQ targets in the BPEM states "*A suitably qualified and experienced professional making an assessment against these objectives enables a better understanding of the risk of harm and the extent of stormwater management that is adequate to support values [in Table 1]*."What additional oversight is there in regards to the assessment

of ‘suitably qualified and experienced professional’? Will this ensure that inaccurate or understated risk assessment is not utilised for the justification of lower water quality targets in specific areas of waterways?

- **Section 2.1 – Assess risk: factors to consider- Table 1: Quantitative Performance Objectives for urban stormwater (pg 7):** The Flow Reduction target has been split into priority areas and non-priority areas. Are Priority areas the same as Priority Waterways? as highlighted in an earlier section of the document. And what is the justification for the split? The Glenelg Hopkins Waterway strategy identifies priority waterways based partly on their current health. If developers can release flashier flows into already degraded systems, this will reduce their ability to achieve a higher priority status. Also, what consideration has been made for potential impacts on downstream priority waterways?
- **Section 2.2- Implementing controls (pg 9):** When providing examples of stormwater treatments, the document refers to "wetlands". Could this be changed to artificial wetlands? To distinguish between natural wetlands and specifically designed artificial wetlands.

Thank you again for the opportunity to comment on this document. If you need further clarification on any of the comments, please contact myself on 0422 806 366 or 5551 3303.

Kind Regards,

Alex Lewis
Water Resources Planner
Glenelg Hopkins CMA

70 Jolimont Street
Jolimont VIC 3002
GPO Box 1614
Melbourne VIC 3001
t (03) 9280 8200
f (03) 9654 8168
hia.com.au

18 December 2020

Draft Urban Stormwater Management Guidance
Attn: Emma Tyers
Senior Industry Engagement Strategist
Environment Protection Authority
via email: emma.tyers@epa.vic.gov.au

Draft Urban Stormwater Management Guidance Consultation Guide

Thank you for the opportunity to comment on the Background information: Draft Urban Stormwater Management Guidance Consultation Guide (Publication 1829) October 2020 (Draft consultation guide).

Please note: HIA consider there are parallels between matters raised in our submission to the Improving Stormwater Management Advisory Committee (ISMAC) and matters we raise in this response to the Draft Urban Stormwater Management Guidance Consultation Guide. For this reason please find attached for your reference a copy of our submission to ISMAC dated 29 June 2018.

Overview

HIA is Australia's peak residential building industry association. HIA members comprise a diversity of residential builders, including all Top 100 builders, all major building industry manufacturers and suppliers as well as developers, small to medium builder members, contractors and consultants to the industry. In total HIA members construct over 85% of the nation's new housing stock.

HIA exists to service the businesses it represents, lobby for the best possible business environment for the building industry and to encourage a responsible and quality driven, affordable residential building and development industry.

As there are a range of HIA members that are involved in the matter of stormwater either as their primary business or carrying out related work as required this correspondence does not attempt to address the breadth of views individual members may have with regard to the Background information: Draft Urban Stormwater Management Guidance Consultation Guide (Publication 1829) October 2020.

HIA submission

The *State of Knowledge* concept, mentioned throughout the Draft consultation guide, is considered particularly relevant to a guidance document such as this. For this reason it would be useful to know if it is intended the final form of the Draft consultation guide will have built in a periodic review, and if so what level of industry consultation will be undertaken as part of any review.

It is HIAs experience that the residential construction industry appreciates and responds positively to guidance material provided by government that is well researched and articulately written. Many

in the industry are demonstrating a willingness to be innovative and applying contemporary approaches to complex matters particularly those that have a societal benefit, such as the management of urban stormwater. For this reason it is considered important that for guidance material to be useful, relevant and have voluntary uptake by industry such guidance material remains just that – guidance material, and does not become absorbed and indoctrinated into legislation and regulation.

HIA considers that the current Victorian planning system provides adequate regulation in relation to the management of urban stormwater. This is achieved by referencing, throughout the Victorian Planning Provisions (VPPs), as a policy document the *Urban stormwater best practice environmental management guidelines 1999* (BPEM) and by the Application and Requirements of Clause 53.18 Stormwater Management in Urban Development.

It is acknowledged the Draft consultation guide discusses the BPEM its status and the review of stormwater science (Pg 7-11) and later in the document discusses Implementation (Pg.15). However, it is not clear to HIA whether the EPA propose that in its final form the Draft consultation guide is intended to replace the BPEM as a policy document in the VPPs or whether in its final form the Draft consultation guide will sit outside the VPPs and it is intended to complement the BPEM and Clause 53.18

HIA consider it important that industry is provided with clarification as to the intended status of the final form of the Draft consultation guide. We believe that the final form of the Draft consultation guide is to complement the BPEM and Clause 53.18 It needs to be clarified that the consultation guide is not a pseudo reference or incorporated document that local government planners and other decision makers attempt to rely on when assessing and determining an application. It is complimentary guide only.

HIA will watch with interest the progress of the Background information: Draft Urban Stormwater Management Guidance Consultation Guide (Publication 1829) October 2020 (Draft consultation guide) and would welcome the opportunity for further consultation as the body of work undertaken by the EPA develops.

Once again we thank you for the opportunity to contribute at this stage. Please do not hesitate to contact Mike Hermon, Executive Director – Planning & Development, on 9280 8236 or alternatively m.hermon@hia.com.au should you require anything further.

Yours sincerely
HOUSING INDUSTRY ASSOCIATION LIMITED

Fiona Nield
Executive Director, Victoria

70 Jolimont Street
Jolimont VIC 3002
GPO Box 1614
Melbourne VIC 3001
t (03) 9280 8200
f (03) 9654 8168
hia.com.au

29th June 2018

Improving Stormwater Management Advisory Committee
Attn: Chair - Chris Chesterfield
Department of Environment, Land, Water & Planning
via email: stormwater@delwp.vic.gov.au
and
Engage Victoria website

IMPROVING STORMWATER MANAGEMENT

Thank you for the opportunity to comment on the Issues Paper DELWP for the Improving Stormwater Management Advisory Committee, June 2018 and to attend the workshop held the morning of Tuesday 26th June 2018.

Overview

HIA is Australia's peak residential building industry association. HIA members comprise a diversity of residential builders, including all Top 100 builders, all major building industry manufacturers and suppliers as well as developers, small to medium builder members, contractors and consultants to the industry. In total HIA members construct over 85% of the nation's new housing stock.

HIA exists to service the businesses it represents, lobby for the best possible business environment for the building industry and to encourage a responsible and quality driven, affordable residential building and development industry.

As there are a range of HIA members that are involved in the matter of stormwater either as their primary business or carrying out related work as required this correspondence does not attempt to address the breadth of views individual members may have with regard to the Issues Paper.

Using the HIA Victoria ENews publication HIA has made members aware of the Issues Paper and recommended members who are involved with stormwater matters to familiarise themselves with the Issues Paper and lodge their own individual response to the review if desired.

HIA submission

HIA is familiar with the purpose of the Advisory Committee based on a reading of the Terms of Reference and as stated at Section 1.2 of the Issues Paper. It is understood there are two parts A and B to the Purpose of the Advisory Committee and that in summary the purpose of the Issues Paper is *to address the issues and opportunities presented* and *focus primarily on the types of stormwater management issues that the Victorian planning and development system currently has, or could have a role in addressing Key Issues.*

In principle HIA does not oppose most of the matters raised and discussed in the Issues Paper though the following comments are provided to assist the Advisory Committee better understand the views of the residential construction industry.

To assist the taskforce in understanding HIA's policy position in relation to this matter the following four HIA policies are attached and referenced throughout this submission.

A. Infrastructure Charges and Levies on Residential Development
B. Government Infrastructure Investment
C. Environmental Constraints and Planning Regulatory Creep, and
D. Truth in Zoning

Pages 5, 11, 21 and 22 with regard to funding: cost recovery mechanisms, offset schemes and Voluntary stormwater offsets

1. Victoria's planning and development approvals system has a number of mechanisms requiring developers to contribute toward the cost of a range of physical and social infrastructure. In relation to stormwater, particularly in metropolitan Melbourne, the two most common methods for developers to contribute toward the cost of drainage and stormwater infrastructure is in the form of an Infrastructure Contribution Plan prepared in association with a Precinct Structure Plan by the Victorian Planning Authority and typically administered and managed by the relevant local government agency. The other method is Drainage Schemes prepared and administered by Melbourne Water.

   HIA has an established policy position opposing Infrastructure Contribution Plans (ICP) as it is considered ICP's significantly affect new housing affordability and are in effect a tax on new homebuyers..

   Throughout the Issues Paper there are several references questioning and discussing the appropriate method to recover the construction and maintenance costs of public stormwater infrastructure. The paper acknowledges some councils have expressed interest in developing their own local stormwater offset schemes. HIA strongly opposes councils being able to develop their own local stormwater offset schemes if the funding source for the scheme was to be derived from developers. Drainage and stormwater assets have a far reaching community benefit, it is therefore submitted the funds to construct the assets should be levied as a broad tax across the whole community. As such HIA is opposed to another developer funded item of infrastructure for items that the entire community benefits from.

   HIA consider that funding arrangements for the construction, upgrade and maintenance of drainage and stormwater infrastructure is one of the most important issues to be considered as part of the Issues Paper and would welcome the opportunity to discuss this in more detail with the Advisory Committee. Details regarding the appropriate contact person and forum for engaging with relevant HIA staff and members is provided at the end of this letter.

   Refer Attachment A - Infrastructure Charges and Levies on Residential Development, and
   Attachment B - Government Infrastructure Investment

Page 16 with reference to Building requirements and Local policies

1. The Advisory Committee may be aware of HIA's opposition to the introduction of an Environmentally Sustainable Development (ESD) local policy by seven councils in 2013 and 2015. We consider a brief explanation of our opposition is relevant in the context of establishing consistency in the comment and feedback HIA is providing in relation to the Building requirements and Local policies discussed in the Issues Paper.

   The principles of ESD are well understood by HIA. HIA has several policies that support the incorporation of ESD principles into a range of residential developments at the appropriate stage of development. HIA's fundamental opposition was that the seven councils were 'going it alone' to introduce as a local policy matters that, if considered reasonable to be in the planning system, should be addressed on a state-wide basis with the objective of encouraging and incentivising the implementation of ESD principles rather than mandatory requirements. HIA submit that to avoid industry confusion among all practitioners it is

important that policy duplication and regulatory overlap is not inadvertently designed into the development approvals process.

Many of the principles contained in the local ESD policies of the seven council's were a duplication of regulation contained elsewhere in the development approvals process, such as in the Building Act. The ESD policies were being used to unnecessarily bring forward requirements that already exist and function adequately in other jurisdictions.

HIA recommends that if an approach of state based objectives to encourage and incentivise the principles of stormwater management were to be applied councils with existing and proposed local policy relating to stormwater and stormwater management should be discouraged to abandon these policies and the State government take a lead role.

Refer Attachment C - Environmental Constraints and Planning Regulatory Creep

Page 17 with reference to the Conceptual Planning Control options

1. HIA recommends the Advisory Committee proceed with caution when determining the types of development that should be required to comply with Best Practice Environmental Management (BPEM) guidelines. In particularly renovations that do not currently require planning approval should not be required to comply with the BPEM guidelines as regulatory requirements for this type of development will be captured elsewhere in the development approvals process. Similarly, if one dwelling is to be constructed on a residential allotment this should also be excluded from having to comply with the BPEM guidelines on the basis that the land is being developed in accordance with the intent of the planning scheme.

2. If the proposal to impose WSUD on the listed development types was to proceed further robust consideration would need to be given to the following points:
   a) Integration into broader stormwater management strategies that may be downstream of the development
   b) Identification of a Legal Point of Discharge all land zoned residential to allow for a ready connection to reduce the impact of providing on-site detention systems that can have a negative impact on the economic development potential of a site
   c) The costs on the developer to implement the WSUD infrastructure
   d) The costs on the authorities to administer the WSUD implementation
   e) The ongoing maintenance and monitoring of the WSUD installation to ensure long term compliance
   f) Training for the building industry may be required to provide that the WSUD measures are installed correctly and provide the designed level of functionality and Installations are not detrimental to the existing stormwater infrastructure

Refer Attachment D – Truth in Zoning

Page 18 with reference to spatial variations

1. To the greatest extent possible performance criteria should be uniform across all jurisdictions to reduce confusion in design, approvals and monitoring of WSUD installations, however there must also be adequate provision within the performance criteria to allow for variation based on either locality or similarities in-terms of the built environment.

   HIA submit a region based (or place based) component of the performance criteria may at times be appropriate, particularly in regional Victoria. In the metropolitan Melbourne context the Department of Environment, Land, Water and Planning – Planning Scheme Groupings, Metro: Inner and Middle Urban, Outer Urban and Growth Area may be a useful means in which to consider performance criteria variations as these groupings reflect similarities in the built environment.

Page 19 with reference to the public realm management

1. Greater effort must be assigned to a high standard of design, construction and maintenance of local retarding basins within public areas that do not impede the use of the land as both an engineering asset and a public resort and recreation asset that can contribute to the provision of a developers private open space requirement either pursuant to Section 18 of the Subdivision Act or requirements pursuant to a Development / Infrastructure Contribution Plan.

HIA connects with its members in a number of ways from Building & Business workshops and Branch meetings to more formal methods such as the Environment, Planning & Development Committee (Planning Committee). Should the Advisory Committee consider it worthwhile to talk directly to the development industry that has both metropolitan Melbourne and regional representatives please contact Mike Hermon, details below, and Mike will facilitate this.

HIA will watch with interest the progress of the Improving Stormwater Management Advisory Committee and would welcome the opportunity for further consultation as the body of work undertaken by the Advisory Committee develops.

Once again we thank you for the opportunity to contribute at this stage. Please do not hesitate to contact Mike Hermon, Director – Planning & Environment, on 9280 8236 or alternatively m.hermon@hia.com.au should you require anything further.

Yours sincerely
HOUSING INDUSTRY ASSOCIATION LIMITED

Fiona Nield
Executive Director, Victoria

Draft Urban Stormwater Management Guidance

City of Port Phillip (Officer Submission)

December 2020

Executive Summary

This submission for Port Phillip City Council (Council) relates to the Draft Stormwater Management Guidance (the Guidance) which is currently out for consultation by EPA Victoria. This is an officer level submission It has been develped in good faith and represents the views of the City of Port Phillip officers on behalf of Council. Due to Council Elections and other constraints there was insufficient time to have this submission endorsed and it remains an officer level submission.

We welcome the opportunity to make a submission to the the EPA on the Draft Stormwater Management Guidance.

Despite being Victoria's most densely developed municipality, the City of Port Phillip's population is projected to almost double in size over the next 30 years. We are therefore a growth council with a significant interest, and responsibility, in ensuring the sustainable management of stormwater in the private realm. Our role is especially important through the development planning process. We are therefore deeply involved in the application of BPEM requirements through both the VPP's and our existing IWM local planning policy, Clause 22.12 – Stormwater Management (Water Sensitive Urban Design). We are committed to ensuring high standards of integrated water management in the private realm.

The key identified change beyond business as usual approaches in the Draft Stormwater Management Guidance is the introduction of flow based objectives to compliment the existing Urban Stormwater Best Practice Environmental Management Guidelines (BPEM 1999) pollutant load reduction requirements. Flow based objectives are important on two levels, they can help protect or restore a hydrologic regime and in doing so mitigate damage to downstream waterways. Flow requirements can also have flood reduction benefits (generally for minor storm events). The introduction of flow based recommendations is welcomed and represents a long overdue addition to existing requirements. The Guidance largely aligns with the intent of Port Phillip's existing stormwater policy and directions we working toward in relation to flow requirements.

While overall we support flow based objectives complimenting existing pollutant load reduction requirements it is notable that the Guideline is not intended to be a compliance document and as such, is not intended to be enforcable. This being the case, a raft of questions must be asked as to how all of this fits into the bigger picture? The Guidance does not sit in isolation and considering BPEM's future is currently tied to SEPP Waters with it's transitional arrangements this is concerning. A clear pathway should already be clearly identified, and comunicated, describing how BPEM will be replaced, or updated and integrated into the new framework. It is not clear how the current reform process intends to ensure that the integrity and inherent qualities of BPEM will be maintained. This must occur in a manner that carries sufficient statutory weight which is enforceable as a referenced document subordinate to appropriate legislation.

It is important to emphasise that the strength of the current BPEM is not through it's regulatory enforcement as part of SEPP Waters. This gives it it's weight but it's true strangth is as an enabler for the planning system, providing a nexus between environmental legislation and the planning. The Urban Stormwater Management Guidance must also have this lense. As such, it needs to be less ambiguous, for example, flow requirements are not well defined and leave a lot of room for interpretation. The Guidance should take a more assertive stance overall. Discretion can, and is provided for within the planning controls but the goal posts should be clearly spelled out. Minimum standards should be clear in the Guidance so that developers know what their starting point is and what is expected of them. Anything less and uptake is likely to be compromised.

Key Reccomendations:

1. Clarify the big picture - BPEM, the VPP's, links to the EP Act, how does it all fit together? The pathway should preceed the detail, including the detail in the Guideline.
2. Ensure Urban Stormwater Management Guidance becomes a reference document with weight, subordinate to appropriate legislation (assuming BPEM is to be retired)
3. Ensure the Urban Stormwater Management Guidance is not done in isolation but in conjunction with updates to VPP's
4. Regardless of the logic behind "reasonably practicable' provide firm objectives for flow reduction requirements as is currently the case for water quality i.e. make possible an enforcable level playing field with a minimum standard (a minimum standard would be in keeping with a preventive focus)
5. Remove reference in the guidance to the proprietary Insite stormwater assessment tool
6. Support the upgrade of an industry auspiced assessment tool such as an upgraded STORM (as a supporting tool for the Urban Stormwater Management Guidance)
7. Introduce guidance on maintenance responsibilities

Discussion

Statutory Status of Urban Stormwater Management Guidance

The statutory strength of the Guidance has significant bearing on how it can be leveraged to achieve desired outcomes through statutory planning. What it should contain and to what extent it is incorporated into environmental legislation and planning controls is dependant on the bigger picture.

1. Is it simply a supporting document to BPEM (assuming a future BPEM ammended to fit within the framework of the new legislation)? or,
2. Is the Guidance intended to replace BPEM or more specifically a part thereof?

While this is not enitrely clear, it is assumed that the long term intent is to replace BPEM with this Guidance, and other guidance on construction and maintence activities. With this in mind it would be helpful if this was clearly mapped for industry. We are being asked to comment on an important piece of a much bigger package without having full clarity on the ultimate intended outcome.

Whilst BPEM is well overdue for an update it is currently the best we have and it is an incredibly important tool supporting our ability to influence sustainable stormwater management in both the private and public realm. If BPEM is discontinued in the future then it's replacement must be designed to achieve, and improve on, outcomes currently achieved through implementation of BPEM. In this context the Guidance, as a replacement instrument would need to :

- be a subordinate instrument to appropriate legislation. There appears to be a level of risk associated with relying on hooks such as 'state of knowledge' and 'reasonably practicable'. The Guidance should be linked directly to policy or legislation so as to carry the statutory weight needed.
- through a co-ordinated approach it should also be linked to all relevant planning policy (State and local) as a complete reform package
- contain, as a minimum the requirements currently included in BPEM

Setting Quantitative Performance Objectives

The use of 'Reasonably Practicable' does not provide sufficient clarity about how objectives should be applied. It is also not applied equally in the Guideline and is only referred to in relation to flow.

This gives an impression that flow is treated with lessor importance than water quality. In reality the industry has been trying to achieve a true accounting for flow since BPEM first came out in 1999 and this requires clarity around targets and expectations.

Water quality has minimum standards for pollutant load reductions of 80% TSS, 45%TP and 45%TN and there is no reason not to apply a similar principle of mandatory minimum standards to flow.

Planners and developers require greater certainty and it is highly likely that in most instances 'reasonably practicable' will not be a threshold that can be assessed adequately. The scale of development (small to medium in particular), the capacity of developers and the ability of statutory planners to make an informed assessment, without firm guidance, will result in an unworkable situation. As a result it is likely that flow objectives will not see widespread uptake. This can be remedied by setting minimum standards for flow for all catchments. These should be firm performance objectives based on Healthy Waterways Strategy objectives. This may require a spatial overlay to define where specific objectives apply.

Reasonably practicable should apply as an overarching princple to everything including water quality, but does not need to be expressed in terms that enable or imply that the performance objectives can be brought into question. Generally, when this occurs, it is a license for the development industry to aim low.

There is sufficient flexibility within the planning system for reasonably practicable to be applied.

Assessment

The Guideline provides information to support assessment of key water quality and flow objectives referencing the tools MUSIC, STORM and InSite. MUSIC is clearly the benchmark however, there are signficant concerns with the other two tools.

The appropriateness of referenceing InSite is strongly questioned. This is a commercial tool, it does not have any governance structure to ensure it is operated and maintained appropriately and furthermore, the tool has not been rigourously tested or evaluated by the stormwater industry or relevant institutional stakeholders in Victoria. It remains somewhat of a 'black box' and must currently be taken on good faith. There is also no process to manage relationships between tool developers and proprietary device suppliers. This is not an opinion that something is wrong with the tool simply, that it's technical merit is untested, it's governance is non-existant and as regulators we have a choice as to whether or not this is a space that is appropriate to be commercialised.

By referencing the tool as 'appropriate' in the Guideline, it could be seen, indeed has already been seen, as an endorsement by the EPA. This is questionable on many levels. Is it the place of the regulator to pick winners in what is, by default, becoming a commercial space? Has due dilligence been undertaken in assessing this tool's technical merit? What process is in place to ensure other tools can receive similar endorsement (remembering this Guidance will have a long shelf life)? Does EPA endorsement come with a comensurate commitment to regulate (in accordance with a protocol) good tool goverance and compliance in a commercial space?

Currently we do not have a protocol for commercially developed assessment tools, we have no system to review them and the imact of their cost, both on developers and councils, has not been considered.

There is a **significant risk that the genie escapes the bottle** here and simply because a commercial player enters the space does not make their product technically appropriate let alone the right approach.

It cannot be overstated how improtant it is to have an appropriate assessment tool for small scale development (70% of Melbourne's growth, through to 2050, will be infill). There has been a concerted but unsuccessful effort on a number of occasions to renew or replace the STORM tool (including two significant attempts supported by the City of Port Phillip). The tool's capabilities are lacking. This is a pressing issue for the industry which is not well recognised or understood and will be made more complicated by furthering flow objectives. However, it is a relatively simple process to develop an industry endorsed tool and the main factor that has been lacking has been a commitment from key stakeholders to get the job done.

Victoria needs a well governed approach which is transparent and easy to follow. Preferably we require a single tool to keep everyone on a level playing field. Policy makers and implementers should be able to manage and adapt this tool over time within an appropriate structure. While STORM is inadequate, it still works and can bridge the gap untill an alternative is developed. The solution is to commit to a new tool which is scoped and developed through a transparent process. The EPA can take a role in supporting such a process along with DELWP, Melbourne Water and councils. An endorsement of InSite not only has technical question marks but could have a range of long term ramifications.

Resolving this issue is critical to the success of the Guideline.

Operation and Maintenance

The utility of this Guideline is likely to be its value as a tool referenced within various planning instruments. One of the greatest impediments to successful rollout of water sensitive urban design in the private realm is the ongoing maintenance and operation of systems. Setting up an appropriate framework to ensure compliance is complex and the Guideline can play a role. Given this is likely to be one of the few 'hooks' available to the planning system the inclusion of advice on operation anad maintenance is advisable. When a document is referenced and forms a part of a planning condition it becomes enforcable (to planning compliance officers) and that is the first step to establishing an implementable compliance framework for the operation and maintenance of WSUD assets in the private realm.

The Guidance, as a minimum, should include statements around mandatory operation and maintenance requirements and would ultimately benefit from case studies or templates to guide maintenance activities. The City of Port Phillip has developed standard maintenance manuals which can be found under WSUD at https://www.portphillip.vic.gov.au/planning-and-building/where-do-i-start/sustainable-design.

Interpreter Services

For languages other than English,
please call 03 9209 0147

epa.vic.gov.au

Environment Protection Authority Victoria
GPO Box 4395, Melbourne VIC 3001
1300 372 842

Authorised and published by the Victorian Government, 1 Treasury Place, Melbourne

EPA0093