



alluvium

FINAL REPORT:

Moonee Ponds Litter assessment for the Chain of Ponds Collaborative Committee

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Glossary

Regional litter generation hotspot	Areas of street litter generation identified as the highest priority for action
Local litter generation hotspot	Areas of street litter generation identified as secondary priority for action
Street litter	Street litter includes plastic drinking bottles, bags, food container, wrapping from cigarette containers, cigarette butts and aluminium cans

1 Project aim

The Chain of Ponds Collaboration identified litter and rubbish dumping as a catchment-wide issue for Moonee Ponds Creek and litter education and urban renewal as opportunities to transform the Creek (Chain of Ponds Prospectus). A Litter Working Group was formed in June 2019 to identify actions the group could implement and/or advocate for - to address the litter issue. It was felt that an agreed and shared action plan would help the group to prioritise and coordinate energies for greatest impact, lead to a reduction in the incidence and impact of litter and the cost of litter removal. A clear framework and plan that identifies the high priorities for investment was considered vital to achieve this aim.

This project – to develop a framework and draft a litter action plan - attracted significant Melbourne Water (MW) funding as it aligns with the intent of the organisation to move away from investing in end of system litter removal in response to complaints, to instead directing investment into actions that are part of a collaborative and coordinated whole of system approach. The project is intended to develop a model for other systems, that is catchments or municipal areas to follow.

The purpose of this whole of catchment investigation was to gain an understanding of the problem and how to most effectively tackle it across partners. The approach involved investigating:

- the drivers for managing litter
- where litter is coming from
- how litter is transported
- where litter accumulates
- what are the typical and highest risk litter types
- where the litter causes threats to values and services
- identifying the most effective solutions to reduce and manage litter

2 Project framework

A significant part of this project was to develop a framework to use to determine the priority litter actions from a whole of catchment perspective. Figure 1 shows the framework developed for the project.

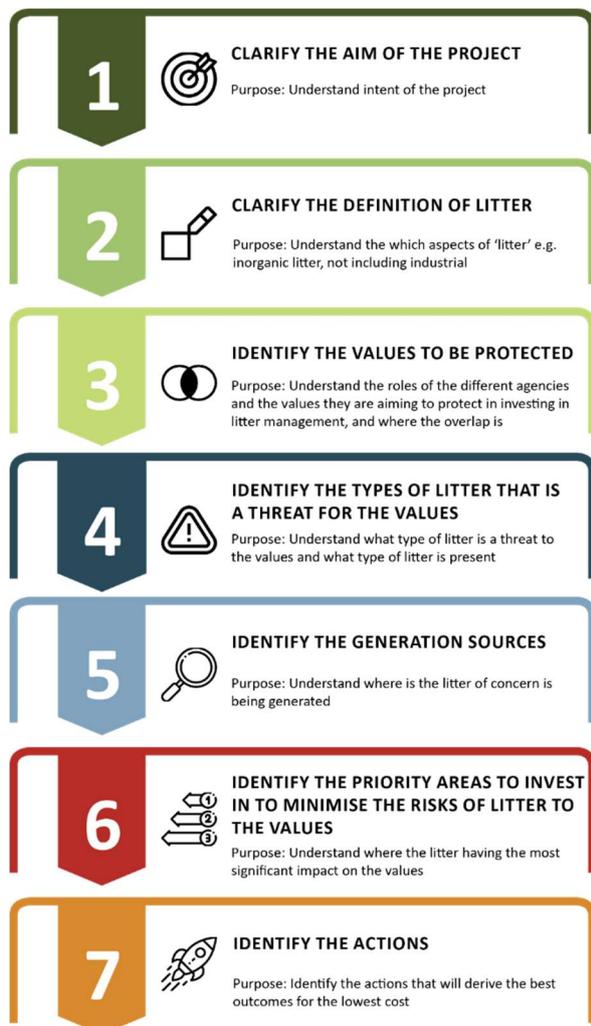


Figure 1. Project Framework

Some of the significant considerations in the development of the framework are outlined below, while the project framework is outlined in more detail in Attachment B.

Some of the first decisions in the framework were agreeing on the definition of litter, identifying the shared values and roles of the agencies, and the determining the litter threats to these values. The definition of litter adopted for the project is:

Any discarded, disposed of, or abandoned man-made objects and organic material that is present on land and in water. It consists of articles that have been made or used by people or businesses and subsequently deliberately discarded or accidentally lost. Examples include, but are not limited to, any waste glass, metal, plastic, paper, fabric, wood, trolleys, microplastics, cigarette butts, medical waste, household items, food, soil, sand, concrete or rocks, abandoned vehicles, abandoned vehicle parts, syringes, polystyrene, electronic wastes and garden remnants and clippings. It does not include natural occurring litter such as leaf litter and stormwater debris.

Values

To determine the shared values and roles to inform the project aims and approach, surveys were completed by MW and a number of councils (see Attachment E for survey templates). The shared values and roles were identified as the protection of the environmental and social values of the waterways and Port Phillip Bay.

Threats

The next step was to identify the threat litter poses to the waterways and Port Phillip Bay. The Port Phillip Bay Environmental Management Plan (EMP) was reviewed to identify the threats litter poses to the bay. The threat to the waterways values was assessed by using the conceptual models developed for the Healthy Waterways Strategy. Polystyrene and 'street' litter - including plastic drinking bottles, bags, food container, wrapping from cigarette containers, cigarette butts, aluminium cans etc – were identified as posing the most significant threat due to the high volumes and the risk they pose. They impact amenity when they are visible litter in waterways or caught up in vegetation, and they pose an environmental threat once they break down into microplastics.

Generation sources

The original approach for the project included the on-ground assessment of litter to inform the analysis of litter sources. Due to COVID-19 restrictions the on-ground sampling was not able to be undertaken and this was replaced instead with the:

- Development of a GIS based survey for community and agency to assess litter locations and perceptions (see Attachment E for the GIS survey template)
- Assessment of existing litter data for the catchment (including data from Let's Strain the Drain, Yarra River Keeper's polystyrene investigation and Ocean Crusader's litter data.)
- Assessment of historic community complaints data from MW and Councils.
- Analysis of the recent Hoffman's project findings to understand the most likely litter generation sources.

The existing litter data for the Moonee Ponds Creek, combined with the responses to our GIS survey, provided sufficient data to identify areas of litter accumulation and litter generation by clustering complaints within the Moonee Ponds catchment.

Priority areas

For the management of polystyrene, the recommended actions target the producers and users of polystyrene. For street litter a number of regional and local litter generation hotspots have been identified based on assumptions about where the largest loads of litter are being generated.

We consider addressing these areas with the highest litter generation to be the most effective way to reduce the total litter load - which is desired for the bay - as well as reducing litter at the associated waterway litter accumulation sites in a cost effective manner.

No attempt was made to rank the priority of the litter accumulation areas. The prioritisation of litter accumulation sites was considered unnecessary for the environmental values as no area along the waterway was identified as having values where the management of litter is more important for litter reduction than any other (this would have been different if there were platypus in the system).

Prioritisation of litter accumulation hotspots from a social amenity perspective was considered unnecessary as the philosophy was to focus more on litter generation over litter accumulation. Any prioritisation of litter accumulation sites would be very subjective. If prioritisation of litter accumulation sites is required to further narrow down which of the litter generation sites are the priorities to invest in this could be done through a community survey, collating visitation data, or using the park/trail network as a surrogate for visitation.

3 Action plan aim

The aim of the action plan is: Identify the priority actions to reduce the impact of polystyrene and street litter on the aesthetics and environmental values along the waterways and reduce the impact of litter (particularly microplastics) on Port Phillip bay.

4 State of litter in the catchment

4.1 Litter in Moonee Ponds Creek

The Let's Strain the Drain data for Moonee Ponds Creek (2019-20) reported polystyrene as the most significant litter by count, with plastic in second place with a total of 840 pieces across 4 categories and cigarette butts third placed. Figure 2 summarises the Let's Strain the Drain data for Moonee Ponds Creek by litter type. Table 1 shows the raw data.

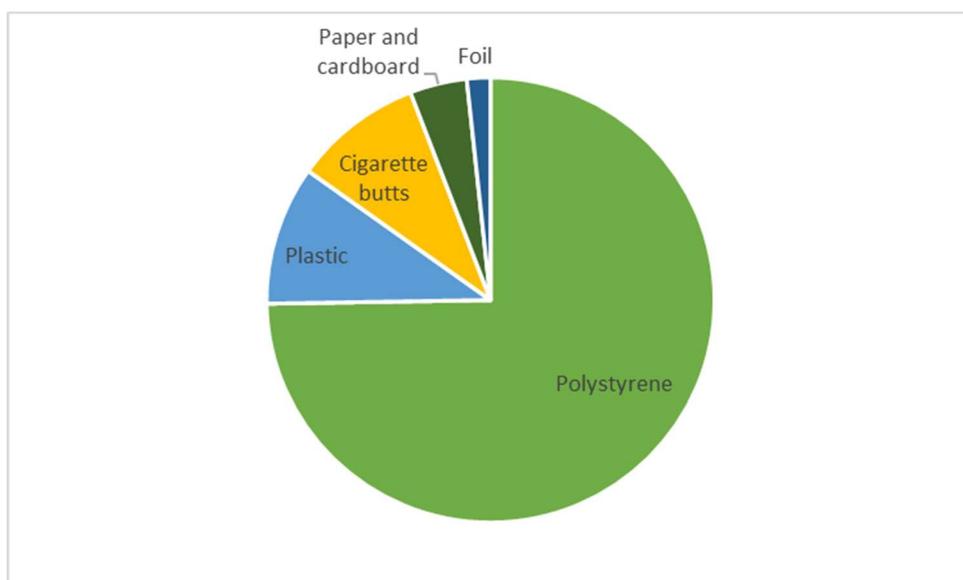


Figure 2. Let's Strain the Drain data for Moonee Ponds Creek (2019-20) by litter type

Table 1. Let's Strain the Drain data for Moonee Ponds Creek (Moreland City Council, 2020)

Litter items	Total items	% of total
Polystyrene insulation & packaging (whole and remnants)	6,200	72%
Plastic wrap non food (bubble wrap etc)	263	3%
Plastic packaging food (wrap, packets, containers)	212	2%
Plastic film remnants (bits of plastic bag, wrap etc)	194	2%
Plastic bits & pieces hard & solid	171	2%
Cigarette butts & filters	773	9%
Miscellaneous paper, labels & tickets	278	3%
Foil wrappers, packets, bladders & alfoil	141	2%
Paper & cardboard packaging	64	1%
Packaging accessories (seals, reels, spools, handles)	61	1%

The Ocean Crusader clean up data (2018), from their clean up event in the lower section of the Yarra River and Moonee Ponds Creek in April 2018, showed that polystyrene was the most significant litter by count, with plastic second and aluminium cans coming third. A total of 9,354 pieces of plastic litter across 5 categories was collected. Figure 3 summarises the Ocean Crusader clean up data by litter type. Table 2 shows the raw data.

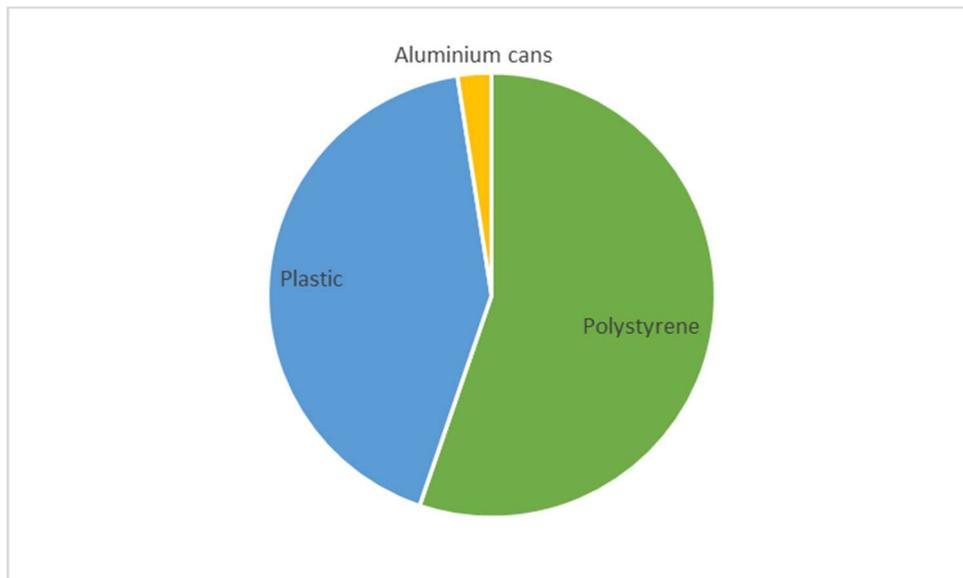


Figure 3. Ocean Crusader clean up data (2018) by litter type

Table 2. Ocean Crusader clean up data (2018)

Litter items	Total	% of total
Polystyrene)	12,200	55%
Plastic wrap (non-food)	128	0.5%
Plastic Bottles	1815	8%
Plastic pieces (soft) and plastic bags	2927	13%
Plastic pieces hard	3020	13%
Toys/Ribbon	1464	6%
Aluminium cans	540	2%
Rope (m)	35	1%

4.2 Litter movement in Moonee Ponds Creek

The RMIT litter tracker work (RMIT University, 2019) showed that once litter entered the creek, it moves quickly through the channelised section of the waterways, getting stuck in the closest downstream vegetation and staying there for long periods until it is collected or moved downstream in the next rise in water levels.

This supports the assumption made in this project that the regional litter generation hotspots are a key contributor to the litter complaints along Moonee Ponds Creek.

5 Project findings and actions

For the purpose of recommending actions we categorised the litter into two groups— polystyrene and ‘street’ litter. Street litter includes plastic drinking bottles, bags, food container, wrapping from cigarette containers, cigarette butts and aluminium cans. The groupings are useful as the management actions required to address polystyrene and street litter are different.

5.1 Polystyrene issues and recommendations

Polystyrene consistently ranks as one the most common litter collected in the litter assessments. To understand the source of polystyrene in the Moonee Ponds Creek we reviewed the recently completed Yarra River Keepers Association (YRKA)’s Polystyrene Pollution report (Barmand et al. 2020).

The most common form of polystyrene found in the YRKA assessment (Figure 3) is the bulk goods packaging (e.g. remnants of polystyrene boxes and packaging from boxed goods), followed by polystyrene balls. Polystyrene balls are created as other forms of polystyrene break down, as it passes through the stormwater system and waterways.

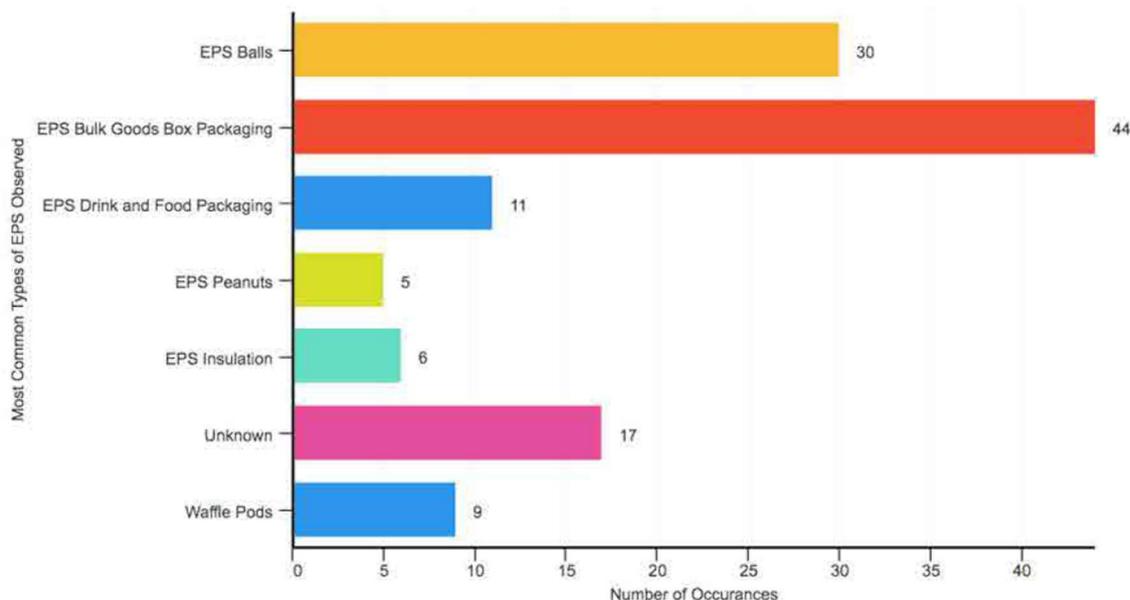


Figure 3. Most common types of Expanded Polystyrene (EPS) observed across Melbourne (Barmand et al. 2020).

The YRKA project undertook a number of observations in the Yarra and Moonee Ponds catchment. The Moonee Ponds observations are demonstrated in Figure 4.

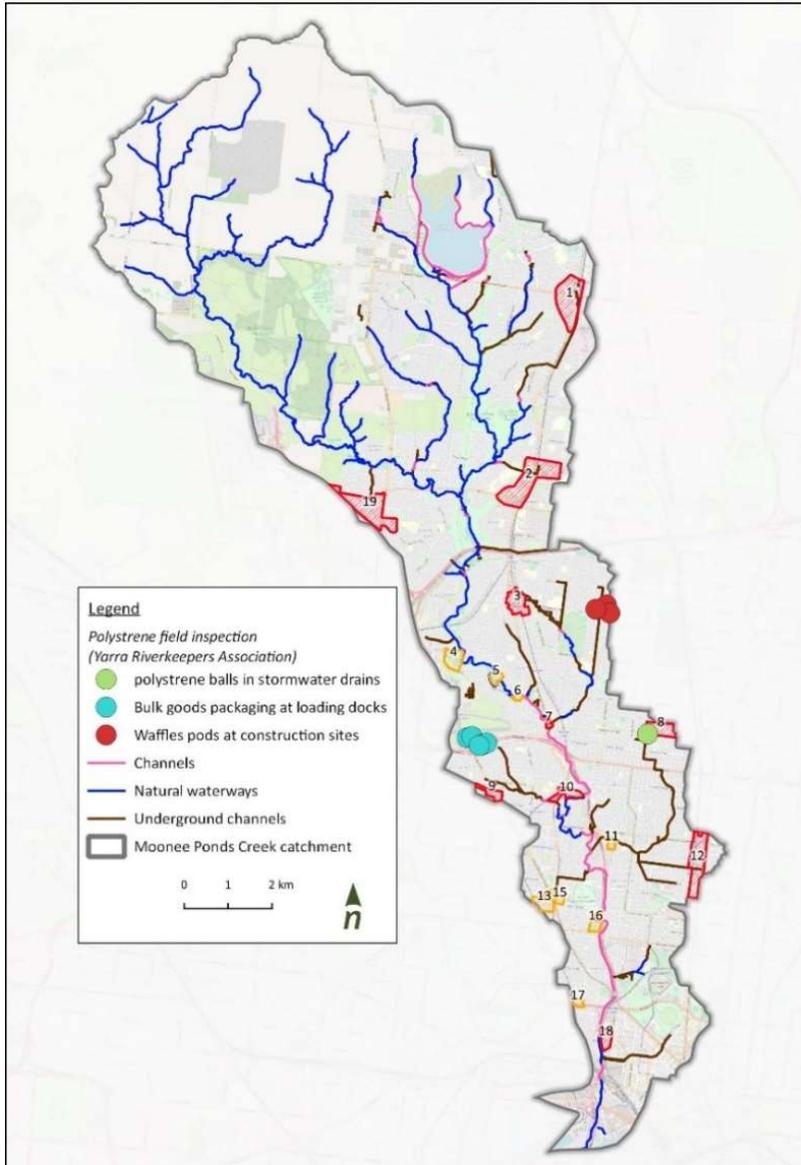


Figure 4. Locations with polystyrene issues (data provided by Yarra Riverkeepers Association, 2020)

The YRK findings from the investigations across the Yarra and Moonee Ponds catchment was that “while the number of observations per source type remain relatively small, it is interesting to note that approximately 81% of EPS [Expanded polystyrene] users, 83% of recyclers, 71% of producers and 67% of distributors investigated had some level of polystyrene pollution somewhere around their site or in close enough proximity to be able to be attributed to their activities.”

The YRKA’s Polystyrene Pollution in the Yarra River report also made a range of recommendations. These are the basis of the recommendations for polystyrene action within this plan.

5.2 Polystyrene actions

Polystyrene Action 1	Develop an education/behaviour change program to target significant producers and users (e.g. retailers) to understand the issue and support them to develop a waste management plan.
Rationale	<p>The break-up of polystyrene back into balls makes the capture of polystyrene problematic once it reaches the waterway. Gross pollutant traps (GPTs) are designed to capture litter that is >5mm in diameter, so once polystyrene breaks down in the waterway or in the GPT it can pass through litter traps. This characteristic makes the management of polystyrene at source a priority.</p> <p>Target large scale users such as businesses that deal with goods in polystyrene packaging, include white goods retailers, insulation suppliers, seafood and vegetable retailers. Targeting large scale users is considered more effective than homeowners given the volumes of polystyrene.</p>
Polystyrene Action 2	Audit/enforce appropriate commercial area waste management for businesses that deal with good in polystyrene packaging
Rationale	<p>The detailed litter assessment for the Hoffman's project identified the rear of commercial premises (i.e. back alleys behind shopping strips) as a significant source of litter to stormwater due to over filling of bins and spillage from commercial litter collections services. Where the waste is likely to include polystyrene, this management action is even more important.</p> <p>Note: this recommended action overlaps with the regional litter generation recommendation 1 which includes the review and auditing of commercial litter management in hotspot areas.</p>
Polystyrene Action 3	<i>Work with fellow organisations (e.g. Yarra River Keepers Association and the Port Phillip Bay EcoCentre) and peak bodies (e.g. Expanded Polystyrene Australia) to advocate for reduced use and improved product stewardship of polystyrene including:</i> <ul style="list-style-type: none">• <i>Education about the impacts</i>• <i>Funding for R&D of replacement products</i>• <i>Greater restrictions/controls on its use</i>• <i>Improved recycling opportunities and/or end of life management.</i>
Rationale	<p>There are a range of partners and opportunities available for the CoP Litter Working Group to work with to improve the community's knowledge of the impacts of polystyrene, and to encourage appropriate management.</p> <p>The Yarra River Keepers Association and the Port Phillip Bay EcoCentre have recently completed two significant reports based on their research into the issues and opportunities to address polystyrene and microplastics.</p>

Polystyrene Action 4 **Incorporate requirements for the appropriate delivery, storage, and recycling of waffle slabs on construction sites to the appropriate guidance material and permits.**

Rationale Our assessment of publications targeting litter management for the construction industry, lacked any focus on the management of polystyrene. These include Melbourne Water and EPA’s Keeping our Stormwater Clean: A Builder’s Guide; EPA’s Reducing stormwater pollution from construction sites; and council’s Sustainable Design Assessment in the Planning Process: 10 Key Sustainable Building Categories.

Review and improve the current framework for auditing and enforcing waste management requirements for building and construction sites - with a focus on the appropriate management and recycling of polystyrene.

- Polystyrene Action 5**
- Practices to be considered include:**
- **Existence of appropriate bylaws to require appropriate litter management**
 - **Communication about requirements (e.g. guidance material, permits) and good practice**
 - **Auditing sites for compliance**
 - **Enforcement to deter poor performance**
 - **Coordinating auditing and enforcement within councils and across councils for efficient delivery.**

Building and construction sites are anecdotally thought to be the main source of litter in residential housing areas.

The YRK report refers to industry practice for the management of polystyrene offcuts from waffle pods: <http://www.environment.gov.au/system/files/resources/b0ac5ce4-4253-4d2b-b001-0becf84b52b8/files/case-studies.pdf>. As noted above, we could not find any reference to the management of polystyrene in any of the guidance material designed for construction managers. Nor could we find evidence of widespread knowledge of pod bags in the Moonee Ponds catchment. Anecdotal feedback from the Master Builders Association of Victoria indicated that in areas such as Eltham, where council is “hot on fines”, builders ensure polystyrene is captured.

Rationale The recommended action is based on the finding of Melbourne Water’s Review of the Building Site Controls Pilot Project (2002) which ran across Hume, Moreland, Moonee Valley, Melbourne, Casey and Kingston and showed the positive impact on construction practices from education and enforcement, when combined (not in isolation).

The project included development of a template for Local Law for Managing Building and Construction Sites and developed a range of tools to assist with education and enforcement. It found it is important to not only audit and enforce appropriate action on poor building site practices, but also to identify and promote good practices when auditing and showcasing these to the sector. Not only does it encourage ongoing positive building site practices/behaviour, but it provides a visual demonstration or benchmark example to other builders. It would be better to encourage behavior change if the findings of the audit resulted in a media story, acknowledging the business names that were found to be doing the right thing (not the non-conformers) which would support their positive marketing and continued positive behavior; and likely to alter non-conforming behaviours.

The action also aligns with the current Councils' Litter Environment Action Network (CLEAN) work.

Feedback from councils suggested that there is also room for improvement in the coordination of auditing and enforcement within councils, and the potential for sharing learnings/resources across councils.

To understand where to target the actions for managing building site litter (including polystyrene) we attempted to identify the suburbs with the highest rates of building permits, but not all councils were able to provide this data to the project. We expect that the higher rate of building permits would be occurring in Hume given its location as a growth council, therefore this action would likely be considered a priority for the Hume council area part of the Moonee Ponds catchment. However, given there is ongoing development and redevelopment occurring across the entire catchment (not just in Hume), it would be beneficial that the action is applied more broadly, across all council areas.

5.3 'Street Litter' issues and recommendations

Street Litter is a shorthand term adopted in the project to refer to plastics from cigarette packaging, food and drink packaging, cigarette butts and aluminium cans. These items are consistently found in high number in litter counts for Moonee Ponds Creek.

The philosophy adopted for the management of street litter in the action plan is:

- Focus the majority of investment for street litter into the regional hotspots, where you can make the biggest impact on the total litter loads. This will have the best outcomes for the bay and by default, this will reduce the volumes of litter at many of the litter accumulation points, therefore reducing the number of litter complaints overall.
- Invest in the local hotspots with low-cost management actions.
- Identify the litter accumulation sites that are safe/there is community willingness to assist in managing litter to improve litter collection in the meantime.

10 regional hotspots and 12 local hotspots were identified in the Moonee Ponds Creek catchment. The hotspots are shown in figure 5 below and more details about each hotspot, the rationale behind why it was identified as a litter generation point, the summary of physical litter infrastructure at the hotspot, and information on the associated litter accumulation points, is provided in Attachment C.

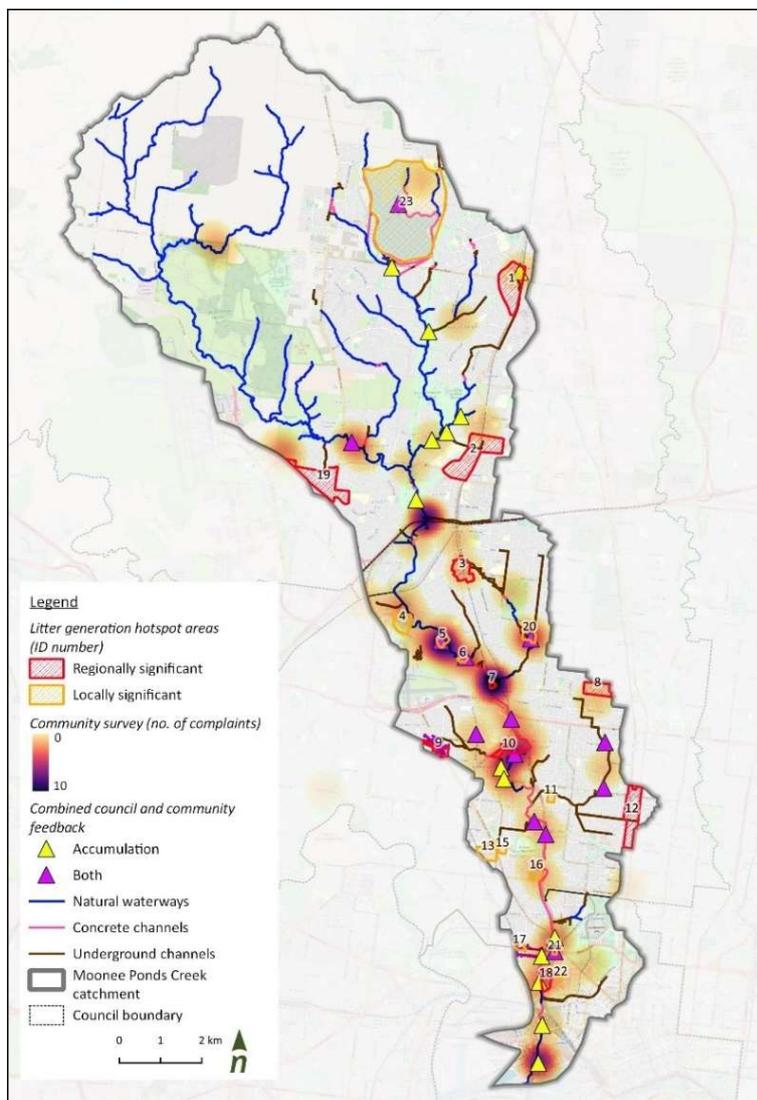


Figure 5. Map of clustered litter generation and accumulation sites, regional and local litter generation hotspots

The regional litter generation sites were not identified from litter survey data, but from the findings of the litter generation assessment in the earlier Hoffman’s project. These include the findings that:

- large commercial shopping strips /areas with multiple take away outlets and associated transport stops are the key litter generation areas.
- schools, smaller shopping strip, public open space and enclosed shopping centres are lower order litter generation sources
- residential and industrial land use tend to generate less street litter over a wider area. This diffuse source of pollution is expected to cost a lot more to manage than the more concentrated street-based shopping strips.

As the regional hotspots were identified via land use analysis rather than direct litter observation there was a risk that may be that some of the regional hotspots were already so well managed with behaviour programs, physical infrastructure and litter management, that they should be removed as hotspots. The feedback from agencies on the draft of this report was supportive of all the regional hotspots identified, as such they have all been retained. .

The local litter generation hotspots were identified where a community complaint cluster coincided with an area of public open space, such as a sports fields, recreational reserves or small groups of local shops.

No on-ground validation was undertaken to support this. The feedback from agencies on the draft of this report was supportive of all the regional hotspots identified, as such they have all been retained and several additional local hotspots were added based on council knowledge of litter issues

5.4 Regional litter generation hotspot actions

Table 3 lists the regional hotspots. See Attachment C for more details on the litter hotspots, including the rationale of why they were identified as a litter generation hotspots, the summary of physical litter infrastructure at the hotspot, and information on the associated litter accumulation points.

Table 3. Regional litter generation hotspots

Council	Regional Litter Generation Hotspot
Hume	Hotspot 1: Roxburgh Park train station and shopping centre
	Hotspot 2: Broadmeadows shopping precinct and train station
	Hotspot 19: Mickleham Road airport waiting areas
Moreland	Hotspot 3: Glenroy retail precinct
	Hotspot 8: Coburg North Shopping Centre
	Hotspot 12: Sydney Road shopping precinct
Moonee Valley	Hotspot 7: Mixed use zone at Gaffney Street, Pascoe Vale
	Hotspot 9: Keilor Road (Essendon) Shopping Precinct
	Hotspot 10: Cross Keys oval and Reserve
Melbourne	Hotspot 18: Macaulay industrial precinct

Regional litter generation hotspots Action 1

Identify the actions required and implement the low-cost actions to reduce litter. Considering actions across:

- **Education, enforcement and behavioural change programs**
- **Coverage and effectiveness of by physical litter infrastructure (e.g. grated side entry pits, GPTs and other litter traps)**
- **Adequacy of litter management measure frequency and effectiveness (e.g. street sweeping, bin emptying)**

For regional hotspots there is a need to identify and implement the appropriate actions to reduce littering and manage litter across 3 aspects - behavioural change, physical infrastructure litter management. There is no evidence that one of these aspects is more important than the other, and all three act in combination to preventing litter getting to waterways.

Behaviour change, education and enforcement - Understand how good current behaviour is, and identify areas to improve including:

- How good is the awareness materials within the hotspot? e.g. spray on decal signage on stormwater pits, retailer litter education material.
- How well educated are traders that they are in a litter hotspot and how well do they manage litter and report litter management issues? Particular focus on polystyrene users.
- Is there a need to audit/enforce the management of litter storage and commercial bin collection behind shops to reduce spillage? (Note: Litter management at the back of shops and spillage from commercial litter collection was identified as one of the most significant issue in the Hoffman’s project).
- Do privately run on-street carparks have effective waste management plans?
- Is there a need to encourage business to develop waste management plans – e.g. adequate self-managed butt-bins for staff at large corporate buildings, waste management for retailer and takeaway stores?

Rationale

Physical assets - Audit the coverage of the hotspots with effective physical litter management infrastructure. A summary of the presence of GPTs and Water Sensitive Urban Design (WSUD) is included in the hotspot description in Attachment C. The desktop analysis shows some regional hotspots have no GPT or WSUD coverage (e.g. Regional Hotspots 7, 10 and 12 in Attachment C).

The audit should consider the presence of:

- Grated side entry pits or other infrastructure that holds the litter in place and prevents litter from entering the stormwater system.
- Gross Pollutant Traps (GPTs) to capture litter entering the stormwater system.

As well as auditing for the presence, sizing and coverage of physical infrastructure for the hotspots, a review of the effectiveness of design and operation may be warranted. For example, our analysis of GPT effectiveness for Wyndham City Council (2006) shows that cylindrical GPTs are more effective at the capture of floating litter than other designs.

Litter Management actions – Understand the frequency and effectiveness of litter management actions e.g.:

- Is the frequency of street sweeping adequate both on the main street and where commercial waste is stored (laneways)? At least daily would be ideal in the highly trafficked commercial areas. Are issues such as parked cars impacting the effectiveness of this?
- Is the clean out of litter in vegetation based WSUDs adequate? While WSUD is not designed to manage litter, vegetation based WSUD often traps litter in situ, enabling collection at the street before it enters the stormwater system.
- Are rubbish bins adequate (in number, lidded, sized for location) and/or emptied often enough – particularly where food is likely to be consumed (e.g. at public transport stops, car parks, takeaway outlets).
- Are GPTs emptied regularly enough (e.g. industry recommended frequency at 75% full)?
- Are the butt out bins/ballot boxes adequate/emptied often enough?

The actions required will vary from hotspot to hotspot depending on what is already in place. Low-cost investment to address gaps such as signage, reviewing physical infrastructure and litter management, should be undertaken as soon as possible.

Before investing in high-cost actions (e.g. GPT installation) an on ground assessment of litter generation would be prudent to confirm the volume of litter generated.

Regional litter generation hotspots Action 2	If required to for more expensive actions (e.g. upgrades of physical infrastructure) consider the a cross agency development of the business case – i.e. partnership across agencies for investment.
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If it is determined that there is a need for high-cost actions, and additional justification is needed to support the business case, there are a number of ways this can be approached:

Rationale

1. Look for savings in potentially ‘over’ servicing of GPT in residential areas as part of a cost offset within a council boundary – ie. if GPTs in residential areas are consistently at <80% capacity when emptied or litter data shows very low volumes of man made litter, reduce the servicing rate.
2. Look at savings across agencies. This could be done by determining the downstream litter accumulation hotspot(s), and the cost of managing litter there versus the investment in upstream infrastructure, as well as the cost of litter clean ups in the bay given that a portion of litter is likely to bypass the waterway vegetation zone and end up in the bay.

5.5 Local litter generation hotspots actions

Table 4 lists the regional hotspots. See Attachment C for more details on the litter hotspots, including the rationale of why they were identified as a litter generation hotspots, the summary of physical litter infrastructure at the hotspot, and information on the associated litter accumulation points.

Table 4. Local litter generation hotspots

Council	Local Litter Generation Hotspot	
Hume	Hotspot 23: Greenvale Reservoir/Reserve and surrounds	
Moonee Valley	Hotspot 4: Boeing Reserve	
	Hotspot 6: Strathmore North Primary School	
	Hotspot 13-14: Moonee Ponds shopping precinct	
Moonee Valley	Melb	Hotspot 17: Newmarket shopping precinct
Moonee Valley	Moreland	Hotspot 16: Ormond Park
Moreland	Hotspot 5: John Pascoe Fawkner Reserve	
	Hotspot 11: Dunstan Reserve	
	Hotspot 20: KW Joyce Reserve	
Melbourne	Hotspot 21: Racecourse Road/Boundary Road	
	Hotspot 22: Melrose Street local retail strip	

Local litter generation hotspots Action 1

Determine the appropriate litter action for the site.

Given the lower levels of litter generated by the local litter hotspots the focus is on understanding the land use and tailoring the management actions to the use.

For example, these areas could benefit from:

Rationale

- Encouraging sporting clubs/retailers to develop waste management plans
- Increasing the use of awareness materials (e.g. stormwater decals/signage)
- Audit existing litter management measures to see if –
 - rubbish bins are adequate and emptied often enough, particularly on high use / event days
 - adequate cigarette bins/ballot boxes are present
 - physical infrastructure such as grated pits are in place to prevent litter gaining access to the stormwater system.

5.6 Litter accumulation sites actions

Even with a strong focus on reducing litter at the litter generation hotspots, there is still likely to be small amounts litter from the hotspots and residential areas making its way down stream, so there will still be a need to manage the litter at the litter accumulation areas

Litter accumulation sites Action 1	Increase engagement and coordination with community to clean up litter generation and accumulation sites where community are willing to assist. Include litter counts and more detailed inspections to determine where litter is generated from (i.e. looking for branding details).
Rationale	There are community groups who are willing to help in the management of waterways and the bay. Work with them to identify safe and effective ways for them to assist in litter prevention and collection at the high priority litter generation and accumulation areas.
Litter accumulation sites Action 2	Agree a consistent methodology for the recording of litter type and volume across agencies and community groups and improve record keeping regarding litter collected litter accumulation sites along waterways – to record the volume of man-made vs organic litter. This will allow better informed assessment of the litter issue in the future
Rationale	In gathering data to assess litter for this project we were unable to obtain data that included the volumes of man-made litter vs organic litter from agency maintenance records. This data would be useful to better understand litter generation and the impact of investment into litter prevention and management over time.

5.7 Litter traps actions

Litter traps include gross pollutant traps, which are often unseen and visible traps (e.g. Jacana wetlands and Racecourse road) that look ugly even when empty and generate complaints and questions about their efficacy.

Local trap Action 1	Where there are visible litter traps in the catchment that generate complaints (e.g. Jacana wetlands and Racecourse road) erect signage to educate people about the frequency of clean outs, the work going on upstream to reduce litter and role of the trap – i.e. let people know if the trap look full and unsightly, it’s because it’s doing its job.
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Rationale

For as long as litter is entering the stormwater system the litter traps will remain an important mechanism for the management of litter.

They can be used as an opportunity to educate the community about the work that goes into managing litter, the roles of different agencies and how they can help.

Local trap Action 2	Analyse the movement of litter in the lower section of Moonee Ponds Creek – including the Racecourse road litter trap and the backwash section to determine if there is a better location/design litter trap to replace the existing Racecourse road trap.
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Rationale

The racecourse road litter trap is reported to be an expensive trap to maintain for the benefit it provides. Explore the potential of a different approach – potentially using the backwash section that appears to act as a natural litter trap – for a more effective trap location and design .

Local trap Action 3	Determine the cost and effectiveness of maintaining the existing Racecourse Road trap or changing the design/location following the improved understanding of litter movement in the estuarine reach.
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Rationale

Explore the alternative to the Racecourse Road trap to determine if there is a more effective design/location.

Local trap Action 4	Agree a consistent methodology for the recording of litter type and volume across agencies and improve agency record keeping regarding litter collected from gross pollutant traps to differentiate between man-made vs organic litter. This will allow better informed assessment of the litter issue and GPT needs in the future.
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Rationale

In gathering data to assess litter for this project we were unable to obtain data that included the volumes of man-made litter vs organic litter from agency maintenance records. This data would be useful to better understand litter generation and the impact of investment into litter prevention and management over time.

5.8 Additional actions

Through the discussion and development of this report a number of additional actions were identified

<p>Additional actions 1</p>	<p>Review design standards for development of new high litter generation land use (i.e Street based commercial areas) to require the appropriate coverage of litter management assets such as grated side entry pits, GPTs.</p>
<p>Rationale</p>	<p>Ensuring all councils have the appropriate standards in place will prevent new litter generation hotspots from being established. This could include consider requirements for circular design GPTS, which have been found to be more effective than inline systems for the management of floating litter (Alluvium (2016)).</p>
<p>Additional actions 2</p>	<p>Review the joint MW/council Stormwater Management Plans (SWMPs) for any outstanding litter management actions.</p>
<p>Rationale</p>	<p>Stormwater Management Plans (SWMPs) were developed for each council area in collaboration with MW between 2001-06. . These very comprehensive plans addressed catchment values, threats, and management actions to resolve urban stormwater issues to guide priorities and investment options for each council. They identify a large range of actions for the effective management of litter (e.g. installation of litter traps.</p> <p>We found there was little awareness of these plans across the partner agencies. We recommend that the SWMPs are reviewed to identify any actions that are still relevant.</p>
<p>Additional actions 3</p>	<p>Determine the most effective way to ensure litter actions are adopted into agencies budgeting, planning and operational workplans</p>
<p>Rationale</p>	<p>To ensure actions from this action plan, and any outstanding actions identified in the review of the stormwater management plans, are incorporated into existing processes to ensure that</p> <p>There may be some lessons agencies can learn from each other and the review of the stormwater plans to identify the most effective way to embed the required actions.</p>
<p>Additional actions 4</p>	<p>Continue to work together to explore the additional and emerging actions, and how councils can support each other in improving litter management</p>
<p>Rationale</p>	<p>A number of additional ideas for improvement in litter management were raised in by agency members via the initial surveys, which were not discussed. These will need future discussion by the group to determine the appropriate actions.</p> <ul style="list-style-type: none"> • Share tips, tricks and issues for different agencies in the management of litter (e.g. clarity regarding roles and responsibilities for actions and data) • Working with state gov to disincentive single use plastics, and implement container deposit schemes • Litter Enforcement Officer dedicated to litter infringements • Management of cars parked all day so sweepers unable to sweep gutters – this will get worse over time. • Management of shopping trolley, O-Bike, white goods, mattress etc. return partnerships between MW, Councils, others

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Attachment A
Summary of actions

Litter Action plan for Moonee Ponds Creek

Action plan aim

Identify the priority actions to reduce the impact of polystyrene and street litter on the aesthetics and environmental values along the waterways and reduce the impact of litter (particularly microplastics) on Port Phillip bay

Polystyrene Actions

1	Develop an education/behaviour change program to target significant producers and users (e.g. retailers) to understand the issue and support them to develop a waste management plan.
2	Audit/enforce appropriate commercial area waste management for businesses that deal with goods in polystyrene packaging
3	Work with fellow organisations (e.g. Yarra River Keepers Association and the Port Phillip Bay EcoCentre) and peak bodies (e.g. Expanded Polystyrene Australia) to advocate for reduced use and improved product stewardship of polystyrene including: <ul style="list-style-type: none"> • Education about the impacts • Funding for R&D of replacement products • Greater restrictions/controls on its use • Improved recycling opportunities and/or end of life management.
4	Incorporate requirements for the appropriate delivery, storage, and recycling of waffle slabs on construction sites to the appropriate guidance material and permits.
5	Review and improve the current framework for auditing and enforcing waste management requirements for building and construction sites - with a focus on the appropriate management and recycling of polystyrene. <p>Practices to be considered include:</p> <ul style="list-style-type: none"> - Existence of appropriate bylaws to require appropriate litter management - Communication about requirements (e.g. guidance material, permits) and good practice - Auditing sites for compliance - Enforcement to deter poor performance - Coordinating auditing and enforcement within councils and across councils for efficient delivery.

Regional Litter Generation Hotspots and Actions

Council	Regional Litter Generation Hotspot
Hume	Hotspot 1: Roxburgh Park train station and shopping centre
	Hotspot 2: Broadmeadows shopping precinct and train station
	Hotspot 19: Mickleham Road airport waiting areas
Moreland	Hotspot 3: Glenroy retail precinct
	Hotspot 8: Coburg North Shopping Centre
	Hotspot 12: Sydney Road shopping precinct
M o o	Hotspot 7: Mixed use zone at Gaffney Street, Pascoe Vale

	Hotspot 9: Keilor Road (Essendon) Shopping Precinct
	Hotspot 10: Cross Keys oval and Reserve
Melbourne	Hotspot 18: Macaulay industrial precinct

1	<p>Identify the actions required and implement the low-cost actions to reduce litter. Considering actions across:</p> <ul style="list-style-type: none"> • Education, enforcement and behavioural change programs • Coverage and effectiveness of by physical litter infrastructure (e.g. grated side entry pits, GPTs and other litter traps) • Adequacy of litter management measure frequency and effectiveness (e.g. street sweeping, bin emptying)
2	If required to for more expensive actions (e.g. upgrades of physical infrastructure) consider the a cross agency development of the business case – i.e. partnership across agencies for investment.

Regional Litter Generation Hotspots and Action

Council	Local Litter Generation Hotspot	
Hume	Hotspot 23: Greenvale Reservoir/Reserve and surrounds	
Moonee Valley	Hotspot 4: Boeing Reserve	
	Hotspot 6: Strathmore North Primary School	
	Hotspot 13-14: Moonee Ponds shopping precinct	
Moonee Valley	Melb	Hotspot 17: Newmarket shopping precinct
Moonee Valley	Moreland	Hotspot 16: Ormond Park
Moreland	Hotspot 5: John Pascoe Fawkner Reserve	
	Hotspot 11: Dunstan Reserve	
	Hotspot 20: KW Joyce Reserve	
Melbourne	Hotspot 21: Racecourse Road/Boundary Road	
	Hotspot 22: Melrose Street local retail strip	

1	Determine the appropriate litter action for the site.
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Litter Accumulation Site Actions

1	Increase engagement and coordination with community to clean up litter generation and accumulation sites where community are willing to assist. Include litter counts and more detailed inspections to determine where litter is generated from (i.e. looking for branding details).
2	Agree a consistent methodology for the recording of litter type and volume across agencies and community groups and improve record keeping regarding litter collected litter accumulation sites along waterways – to record the volume of man-made vs organic litter. This will allow better informed assessment of the litter issue in the future

Litter Trap Actions

1	Where there are visible litter traps in the catchment that generate complaints (e.g. Jacana wetlands and Racecourse road) erect signage to educate people about the frequency of clean outs, the work going on upstream to reduce litter and role of the trap – i.e. let people know if the trap look full and unsightly, it's because it's doing its job.
2	Analyse the movement of litter in the lower section of Moonee Ponds Creek – including the Racecourse road litter trap and the backwash section to determine if there is a better location/design litter trap to replace the existing Racecourse road trap
3	Determine the cost and effectiveness of maintaining the existing Racecourse Road trap or changing the design/location following the improved understanding of litter movement in the estuarine reach.
4	Agree a consistent methodology for the recording of litter type and volume across agencies and improve agency record keeping regarding litter collected from gross pollutant traps to differentiate between man-made vs organic litter. This will allow better informed assessment of the litter issue and GPT needs in the future.

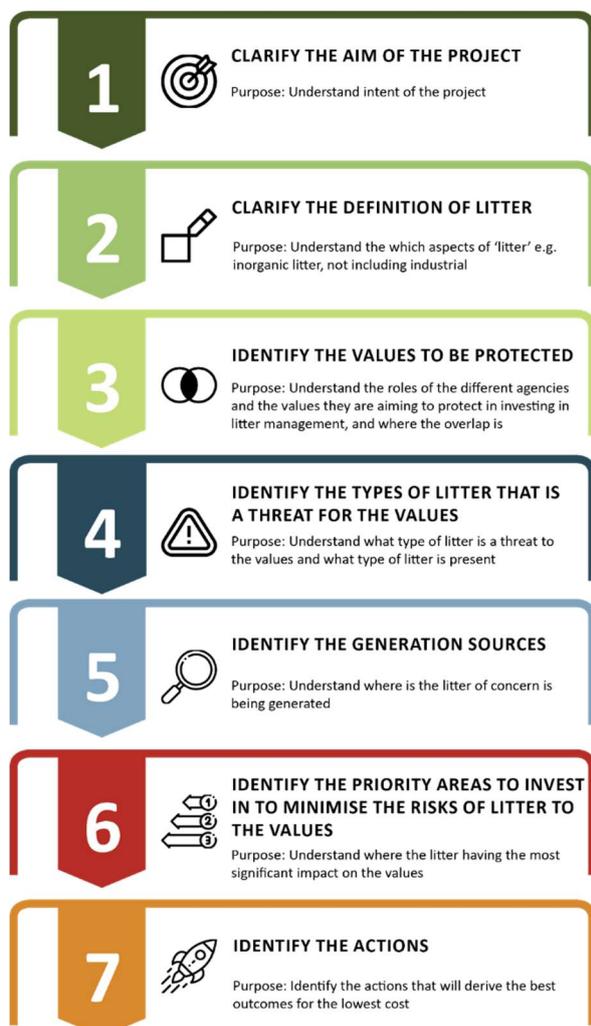
Additional Actions

1	Review design standards for development of new high litter generation land use (i.e Street based commercial areas) to require the appropriate coverage of litter management assets such as grated side entry pits, GPTs.
2	Review the joint MW/council Stormwater Management Plans (SWMPs) for any outstanding litter management actions.
3	Determine the most effective way to ensure litter actions are adopted into agencies budgeting, planning and operational workplans
4	Continue to work together to explore the additional and emerging actions, and how councils can support each other in improving litter management

Attachment B

Overview of the project framework

The framework that was developed through the development of the Moonee Ponds action plan is shown in the following diagram. Each of the steps is explained in detail below.



Step 1. Clarify the Aim of the project

<p>Approach</p>	<p>This project initiated from the Chain of Ponds Collaboration which prioritised the need to address litter issues in the waterway and formed a Litter Working Group to identify actions the group could implement and/or advocate for. Given the complexity of the problem and the range of organisations involved, an agreed action plan, based on an understanding of the key litter issues, would help the group to prioritise energies for greatest impact.</p> <p>It is envisaged that the joint action plan is a strategic document underpinning partnership, incentives and funding applications for improved stormwater and litter management. The aim is to develop a strategic action plan - i.e. a targeted, high impact list of actions - rather than a comprehensive list of actions.</p>
<p>Outcome for Moonee Ponds</p>	<p>Only the high impact, targeted actions to be included in the action plan. Actions to address litter generation hotspots are categorised into regional and local hotspots, with the regional hotspots considered to the areas that are highest priority areas for investment. Local hotspots have been included to ensure that these secondary areas are also considered for any low cost, high impact actions.</p>

How it could be applied elsewhere	This approach is useful for identifying the most strategic areas for investment, rather than a comprehensive list of litter actions. The recommendations of this work for Moonee Ponds is much more targeted, and relatively limited, compared to the list of actions identified in the more comprehensive Stormwater Management Plans, and would be a useful starting point for the identification of priority actions in other catchments.
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Step 2. Clarify the aim of the project

Approach	Given the MP project is focused on man-made litter, organic litter was excluded. Industrial pollution was also excluded. Industrial pollutants such as oil, trade waste and chemicals require a different monitoring and management approach to the 'street-based' litter generated through residential, commercial and industrial areas.
Outcome for Moonee Ponds	<p>Litter definition adopted for Moonee Ponds:</p> <p>Any discarded, disposed of, or abandoned man-made objects and organic material that is present on land and in water. It consists of articles that have been made or used by people or businesses and subsequently deliberately discarded or accidentally lost. Examples include, but are not limited to, any waste glass, metal, plastic, paper, fabric, wood, trolleys, microplastics, cigarette butts, medical waste, household items, food, soil, sand, concrete or rocks, abandoned vehicles, abandoned vehicle parts, syringes, polystyrene, electronic wastes and garden remnants and clippings. It does not include natural occurring litter such as leaf litter and stormwater debris.</p> <p>While hard rubbish was included in the project, the volumes in waterways was considered to be so low that it was not considered included in as a priority to address. That is, while illegal dumping can be a significant amenity issue in residential and industrial areas, only tends to enter the waterway by direct dumping, which is relatively uncommon in comparison to the polystyrene and 'street' litter.</p>
How it could be applied elsewhere	<p>The definition of litter may change depending on the project. Including industrial pollutants such as oils and chemicals would result in the inclusion of a range of trade waste and other actions.</p> <p>A focus on organic waste would highlight the importance of structures such as the Jacana GPT prevent the downstream wetland being inundated with organic waste such as phragmites.</p> <p>Given the MP project found the predominate litter of concern is litter that is transported through stormwater this definition could be refined further to tighten the focus onto 'stormwater transportable' litter, and exclude the 'hard rubbish dumping'. It seems unlikely that there will be areas within the MW region that were 'hard rubbish' dumping to streams is on more significant than stormwater.</p>

Step 3. Identify the Values to be protected

Approach	MW and two council who completed the survey identified Moonee Pond's environmental and social values and Port Phillip bay as a key driver for investment.
Outcome for Moonee Ponds	As there are no platypus in MP the key driving values for investment in the MP plan are Port Phillip bay and the social values. The key social value for consideration is amenity. Amenity underpins the other two social values of community connection and recreation.
How it could be applied elsewhere	If there was a population of platypus in the catchment that would influence the prioritisation of priority areas to manage them.

Step 4. Identify the types of litter that is a threat for the values

<p>Approach</p>	<p>The driving values for investment in the Moonee Ponds plan are Port Phillip Bay and amenity.</p> <p>The litter monitoring data, and the community surveys for Moonee Ponds revealed that polystyrene, plastics, and cigarette butts are significant issues within this catchment. To determine the impact of these forms of litter on the bay and waterways we referred to the Port Phillip bay Environmental Management Plan (PPB EMP) the Healthy Water’s Strategy (HWS) conceptual models.</p> <p>The PPB EMP notes the need to understand and manage the impacts of litter, particularly microplastics.</p> <p><i>“Action 4.2: Support capability and capacity building programs that target litter prevention, including reduction of microplastics (...) This model recognises an evidence-based and multi-faceted approach, combining education, infrastructure and enforcement. This action will also draw on research aimed at addressing gaps in our understanding of litter, particularly microplastics, and its ecological impact.”</i> Port Phillip Bay Environmental Management Plan (2017).</p> <p>The primary threat for the environmental values of Port Phillip Bay is the plastic and polystyrene litter that gets that to the bay and breaks down in the bay to microplastics, where they are consumed and enter the food chain.</p> <p>To determine the impact of litter on the values of the waterways we referred to the HWS conceptual models which outline the key issues limiting the health of the waterway values. The conceptual models show that litter is a limiting factor for platypus and the 3 social values of amenity, community connection and recreation.</p> <p>The conceptual models show that due to the risk of entanglement and drowning the presence of platypus within a catchment would create areas of higher priority for the management of litter within a catchment. The conceptual models do not show a relationship between litter and the other waterway environmental value – e.g. fish, frogs and birds. There is no relationship shown because there is no evidence, or weak evidence, of a significant impact of litter on the health of the values. So while the ingestion of microplastics (including polystyrene) can be assumed to cause harm to all ecological values, the evidence does not show that the litter in waterways are having a significant impact on waterway values in relation to other factors in the environment e.g. lack of flows, poor water quality. As such the environmental values of the Moonee Ponds Creek are not a significant driver for investment in litter management.</p> <p>The conceptual models show a strong relationship between litter and the social values of amenity, community connection and recreation. We assume that a similar relationship exists between the presence of visible litter and social values for Port Phillip bay.</p> <p>Managing litter for amenity means focusing on visible litter. Litter which is easily seen and annoys people along waterways is the type of litter that floats and gets trapped in vegetation – e.g. plastic drink containers aluminon cans, large pieces of polystyrene and food containers.</p>
<p>Outcome for Moonee Ponds</p>	<p>For Moonee Ponds the focus on amenity and bay values, and the data on the litter occurring in the catchment, lead to the lines of enquiry regarding polystyrene and ‘street’ generated plastic litter and cigarette butts.</p>
<p>How it could be applied elsewhere</p>	<p>It is likely that polystyrene and street litter are a significant part of the litter in stormwater across Melbourne. Litter surveys are helpful to verify loads and any additional catchment specific issues, but surveys probably aren’t needed to prove the same issues are the predominant issues within each catchment.</p> <p>Likewise the finding that the values across council agencies that align with MW are around waterway and bay social and environmental values.</p>

Step 5. Identify the generation sources

<p>Approach</p>	<p>Polystyrene Identifying litter sources: To understand where the polystyrene in the stormwater is coming from we used the Yarra River Keepers Association’s Polystyrene Pollution in the Yarra River report (2020) to identify where polystyrene is created and used to identify the likely sources of polystyrene.</p> <p>To understand most likely areas of building site litter (including polystyrene) we attempted to identify the suburbs with the highest rates of building permits, but not all councils were able to provide this data.</p> <p>Street generated litter Identifying litter sources: COVID shutdowns impacted our ability to do physical surveys to understand where ‘street’ litter e.g. plastic food containers and cigarette butts, was being generated and accumulating. Instead we used a community and agency GIS survey, existing data community complaint data and existing litter survey data.</p> <p>In the GIS survey we collected data on the location, volume and type of litter accumulating at a location, and where they thought it was being generated from. Through the survey we registered a total of 108 complaints at 52 general locations from 43 different people.</p> <p>We combined the GIS survey results, the Let’s strain the drain data and the records of community complaints from the past 12-24 months supplied by Melbourne Water, Hume, Moreland and Moonee Valley councils. We used this GIS data to identify clusters of complaints along waterways – referred to as litter accumulation points- and complaints off the waterways – referred to as potential litter generation points. Where the data suggested an area was both a litter generation point and an accumulation point, it was assigned as both.</p> <p>The litter generation points were assessed and classified into regionally or locally significant hotspots.</p> <p>The Hoffman’s findings were critical to the prioritisation of regional hotspots. These include the findings that:</p> <ul style="list-style-type: none"> - large commercial shopping strips /areas with multiple take away outlets and associated transport stops are the key litter generation areas. - schools, smaller shopping strip, public open space and enclosed shopping centres are lower order litter generation sources - residential and industrial land use tend to generate less litter over a wider area. This diffuse source of pollution is expected to cost a lot more to manage than the more concentrated street-based shopping strips. <p>Combining the GIS data and the finding from the Hoffman’s project we designated 10 regional hotspots for areas we believe have the potential to deliver the largest loads of litter. These are the large street shopping strips and areas with multiple take away outlets and associated transport stops. We did not rely on the complaints data to generate these areas, but instead undertook an analysis of the land use.</p> <p>12 local hotspots were identified as secondary areas for improved litter management, in comparison to the regional hotspots. Nine local hotspots were identified by identifying where clusters of litter complaints were associated with areas of public open space or areas with smaller numbers of shops. An additional 3 hotspots were added following council review and feedback on the hotspots.</p>
<p>Outcome for Moonee Ponds</p>	<p>For polystyrene we didn’t map specific generation areas, just the most likely land use that contribute to the generation. Part of the implementation will need to include identifying the locations of significant point source producers and users (e.g. retailers).</p> <p>The recommendations within the body of this report show in the report show the litter generation sites identified.</p>
<p>How it could be applied elsewhere</p>	<p>The question of how applicable the Hoffman’s findings about the key litter generation sources are to this catchment were not tested due to Covid restrictions. The council feedback whether they think there is a need to examine in more detail the litter generation of these sites will be a good test for the</p>

	<p>assumptions. If found to be applicable in Moonee Ponds, it is likely to be applicable in other catchments within the Melbourne region.</p> <p>In other catchments it may be useful to outline these assumptions up front and determine if there are other land uses that are perceived to be high risk loads and by community and council. This could then be tested through on targeted on-ground litter surveys.</p>
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Step 6. Identify the priority areas for investment to minimise the risk of litter to values

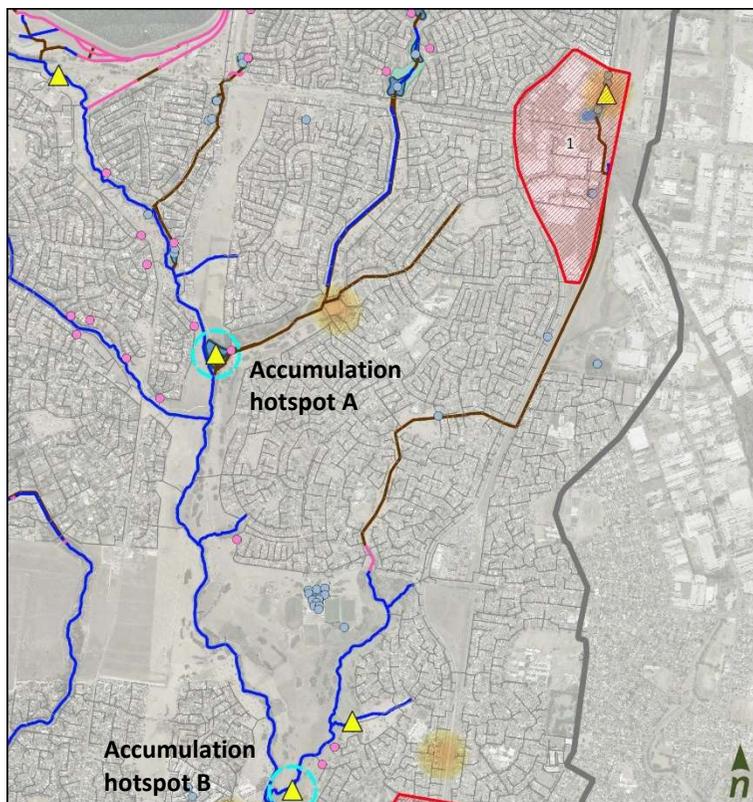
Approach	<p>Prioritising areas for investment for polystyrene For polystyrene the best approach is at source prevention given that they are too small to be trapped once they enter the stormwater system. For polystyrene we didn't map specific areas for action, part of the implementation will need to include identifying the locations of significant point source producers and users (e.g. retailers).</p> <p>Prioritising areas for investment for 'street' litter There are a number of distinctly different ways the Moonee Ponds collaboration could prioritise where to invest in the management of 'street' litter.</p> <p>One approach is to focus on upgrading the litter trap at the bottom of the catchment. We don't recommend this as the investment won't contribute to the management of amenity through the catchment and would be ineffective for managing microplastics – which are too small to be captured in such a trap.</p> <p>A second approach is to prioritise action where you have sensitive environmental values. As described in Step 4 of the framework the environmental values of the Moonee Ponds Creek are not a significant driver for investment in litter management. If an environmental value that was very sensitive to litter – e.g. platypus – existed in the catchment then its range would be a priority for the management of litter that poses a risk of entanglement.</p> <p>A third approach is to prioritise the litter generation sites which are believed to pose the greatest risk in terms of volume of litter generated. The advantage of focusing at source is that it prevents the litter becoming an issue in the waterways and bay. The negative is that it is probably more expensive than just picking up litter where it accumulates along the waterway.</p> <p>A fourth approach is to prioritise increasing the management of where litter accumulates and detracts from the waterway amenity. The advantage of this focus on litter accumulations sites is that it is a cheaper way to deal with the amenity issues, and it can be adapted quickly in response to community complaints. But, it only deals with the litter that is trapped in vegetation and collected – it risks missing a lot of litter (particularly smaller pieces) which will still pass through the system and get to the bay.</p> <p>Prioritisation of litter accumulation hotspots from a social amenity perspective was considered unnecessary as the philosophy for this plan was to focus more on litter generation over litter accumulation sites.</p> <p>If prioritisation of litter accumulation sites is required to further narrow down which of the litter generation sites are the priorities to invest in this could be done through a community survey, collating visitation data, or using the park/trail network as a surrogate for visitation. Any prioritisation of litter accumulation sites would be very subjective.</p> <p>The approach recommend and adopted for this action plan was to:</p> <ul style="list-style-type: none"> - Focus the majority of investment into the regional hotspots, where you can make the biggest impact of the total litter loads. This will have the best outcomes for the bay and by default this will reduce the volumes of litter at many of the litter accumulation points, therefore reducing the litter complaints. - Invest in the local hotspots with low cost management actions, unless the volume of litter is found to justify higher cost actions as well.
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	<ul style="list-style-type: none"> - Identify the litter accumulation sites that are safe/there is community willingness to assist in managing litter to improve litter management in the meantime. <p>We could have assumed that litter generation hotspots higher up Moonee Ponds Creek are of higher priority given that they impact on more kms of waterways. Likewise, we could have assumed that litter generation points lower in the catchment pose a higher risk to the bay as there is less opportunity for interception. Instead we have treated all the regional hotspots as equal importance.</p>
Outcome for Moonee Ponds	<p>Polystyrene - the most effective approach for the management of polystyrene is at source prevention given that it breaks down into pieces that are too small to be trapped once they enter the stormwater system. For polystyrene we did not map specific areas for action, part of the implementation will need to include identifying the locations of significant point source producers and users (e.g. retailers).</p> <p>For street litter 10 regional hotspots and 9 local hotspots were identified.</p>
How it could be applied elsewhere	<p>In other catchments locations with platypus values would have higher priority.</p> <p>On top of the existing survey additional work could be done to identify the areas that are really important within a catchment for amenity. This could be achieved by having more community members complete the survey, or by using a different approach e.g. assessing high visitation areas with high litter loads.</p> <p>There are pro and cons of using community complaints vs known high visitation/high litter load data. E.g. Community survey is less resource intensive to undertake. But using community complaints only tells you where there is currently underservicing of litter management, where as analysing data around visitation and litter loads allows you to understand both where you are already being successful in the management of litter, potentially over servicing litter and where more work is needed.</p>

Step 7. Identify the actions

Approach	<p>We drew on the project team experience in the management of litter to recommend the actions that have the potential to make the most significant improvements to the loads of litter in this report.</p> <p>Feedback from agencies on the draft report was used to validity the recommendations.</p>
Outcome for Moonee Ponds	<p>Final report includes a range of actions supported by the partner agencies. The partnership can now focus on establish the priorities, willingness to participate and lead agencies for the actions.</p>
How it could be applied elsewhere	<p>Many of the actions are transferable, and will form a useful starting point for discussion about priorities in other catchments</p>

Attachment C
Litter hotspots maps and details– by site



Legend

Community survey (no. of complaints)



Combined council and community

- ▲ Litter accumulation
- ▲ Litter generation
- ▲ Litter accumulation and generation

Litter generation hotspot areas (ID)

- Regionally significant
- Locally significant
- Regionally significant accumulation points

● GPTs (Melb Water + councils)

● WSUD assets (Melb Water + councils)

— Natural waterways

— Concrete channels

— Underground channels

— Relevant council pipes

— Council pipes

 Moonee Ponds Creek catchment

 Retarding Basin

 Stormwater Quality Systems

 Waterbodies

0 250 500 m

Description

Location

Litter Generation Hotspot 1 - Roxburgh Park train station and shopping centre

Level of significance

Regionally significant hotspot

Rationale

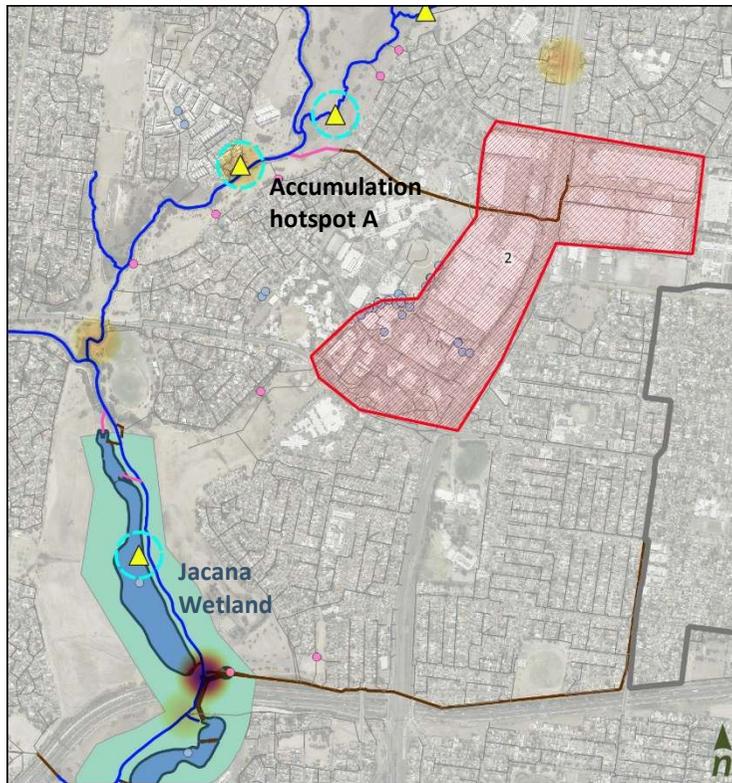
High level of activities at Roxburgh Park train station and surrounding commercial areas. There are two main underground drainage pipes that connect this high priority litter generation hotspot into MPC. The first pipe runs along Shankland Boulevard and into Shankland wetland where we first received litter complaints at Accumulation hotspot A (visual impacts). It then flows into Yuroke Creek. The second underground pipe starts from the Otway Crescent Retarding Basin close to the train station and runs across Broadmeadows Valley Park via Otway Crescent Drain (Council identified Otway Crescent Drain as a hotpot). Three more litter complaints recorded at downstream of Yuroke Creek after Otway Crescent Drain meets Yuroke Creek (Accumulation Hotspot B).

Presence of GPT or WSUD assets

GPT: 1 MW asset located at Shankland Wetland, 2km DS of hotspot. 2 assets located 3.3 km DS of site along Ripplebrook Drive but are treating areas downstream
 WSUD: 1 MW owned wetland system within the hotspot and 1 council owned RB within hotspot

Information on accumulation hotspot(s)

Both Accumulation hotspot A and B were identified by Council as known hotspots, but no specifics on litter type was provided.



Legend

Community survey (no. of complaints)



Combined council and community

- ▲ Litter accumulation
- ▲ Litter generation
- ▲ Litter accumulation and generation

Litter generation hotspot areas (ID)

- Regionally significant
- Locally significant
- Regionally significant accumulation points

- GPTs (Melb Water + councils)
- WSUD assets (Melb Water + councils)
- Natural waterways
- Concrete channels
- Underground channels
- Relevant council pipes
- Council pipes
- Moonee Ponds Creek catchment
- Retarding Basin
- Stormwater Quality Systems
- Waterbodies

Description

Location

Hotspot 2 – Broadmeadows shopping precinct and train station

Level of significance

Regionally significant hotspot

Rationale

High level of activities at Broadmeadows activity centre with large train station. There is one main underground pipe that originates from Railway Cres (in the middle of Broadmeadows activity centre) and connects to an open concrete channel west of Ripplebrook Drive for 200 m before meeting Yuroke Creek.

There were two community complaints about 200 m DS of confluence of the open channel and Yuroke Creek (Accumulation hotspot A)

Presence of GPT or WSUD assets

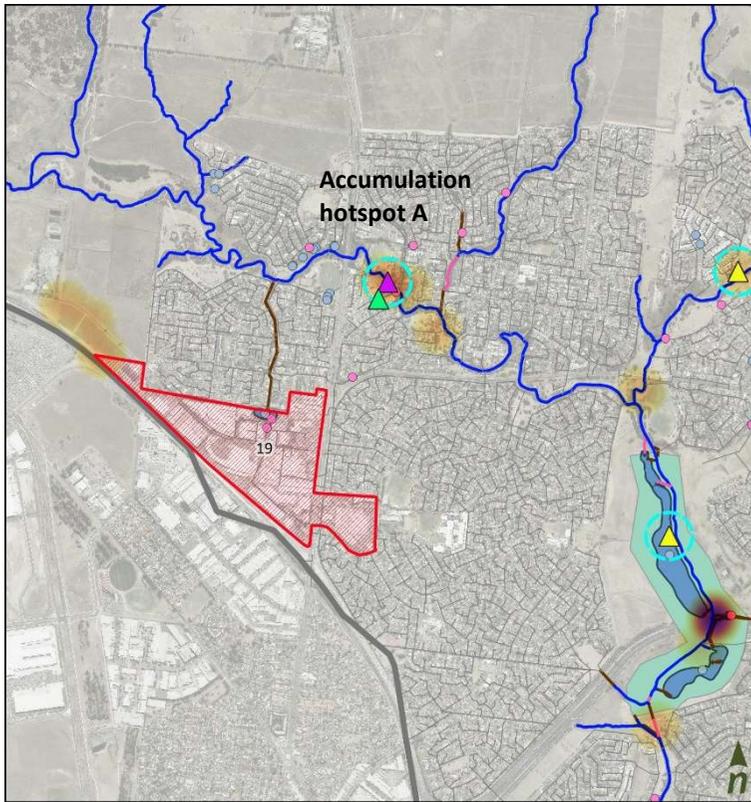
GPT: 1 GPT at Johnstone Street Reserve located DS of the hotspot. 2 GPTs located along Ripplebrook Drive indirectly capturing litter from this hotspot (and nearby schools and residential areas).

WSUD: 16 Council owned raingardens, 4 MW owned raingarden are located within the hotspot

Information on accumulation hotspot(s)

Community identified Accumulation Hotspot as a hotspot for its tendency to collect litter around footbridge during high flow events. Just upstream of Jacana Wetland, community also complained this hotspot receive inflows from nearby roadway and the creek carrying waste from upstream parklands and stormwater drains (with no filters) from roadsides. Common litter types include glass, aluminium cans, recyclable plastics, and non-recyclable soft plastics.





Legend

Community survey (no. of complaints)



Combined council and community

- ▲ Litter accumulation
- ▲ Litter generation
- ▲ Litter accumulation and generation

Litter generation hotspot areas (ID)

- Regionally significant
- Locally significant
- Regionally significant accumulation points

- GPTs (Melb Water + councils)
- WSUD assets (Melb Water + councils)
- Natural waterways
- Concrete channels
- Underground channels
- Relevant council pipes
- Council pipes
- Moonee Ponds Creek catchment
- Retarding Basin
- Stormwater Quality Systems
- Waterbodies

Description

Location Hotspot 19 – Mickleham Road airport waiting areas

Level of significance Regionally significant hotspot

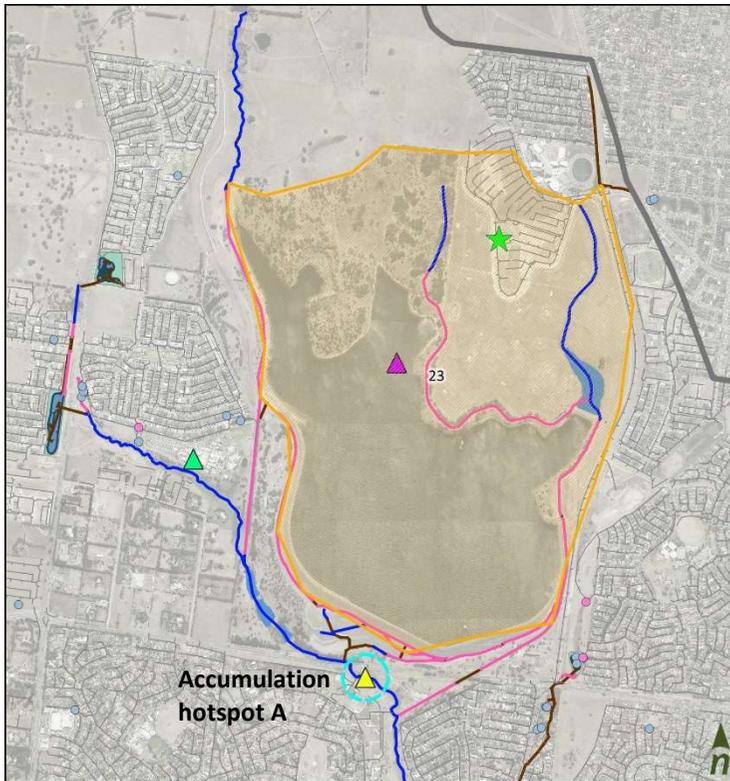
Rationale Commercial hub with major transport hub (e.g. people waiting to collect from airport). High level of takeaway outlets and activities near the airport. Suspect high litter will be generated from this area with previous observations at site.

Rationale North of the hotspot is the Booths Street Retarding Basin and there is an underground pipe that directly feeds into Moonee Ponds Creek. Several community complaints downstream of this hotspot (downstream of Westmeadows IGA and Turner street)

Presence of GPT or WSUD assets GPT: 2 GPTs within the hotspot located before it reaches Global Drive Reserve (Booths St Retarding Basin). 1 GPT directly treating part of the hotspot located 750m DS.

WSUD: 1 wetland at Booths Street retarding basin

Information on accumulation hotspot(s) Community responses identified Hotspot A as local litter hotspot from surrounding amenity (IGA, sports oval), with takeaway food packaging (e.g. fast food), cigarette butts as main litter types However, this area also receives its litter from Hotspot 19 via Turner Street where one community member commented that 'litter is just feral'. Jacana Wetland may likely receive litter from this litter generation hotspot.



Legend

Community survey (no. of complaints)



Combined council and community

- ▲ Litter accumulation
- ▲ Litter generation
- ▲ Litter accumulation and generation

Litter generation hotspot areas (ID)

- Regionally significant
- Locally significant
- Regionally significant accumulation points

- GPTs (Melb Water + councils)
- WSUD assets (Melb Water + councils)
- Natural waterways
- Concrete channels
- Underground channels
- Relevant council pipes
- Council pipes
- Moonee Ponds Creek catchment
- Retarding Basin
- Stormwater Quality Systems
- Waterbodies

Description

Location

Hotspot 23 – Greenvale Reservoir and surrounds

Level of significance

Locally significant hotspot

Rationale

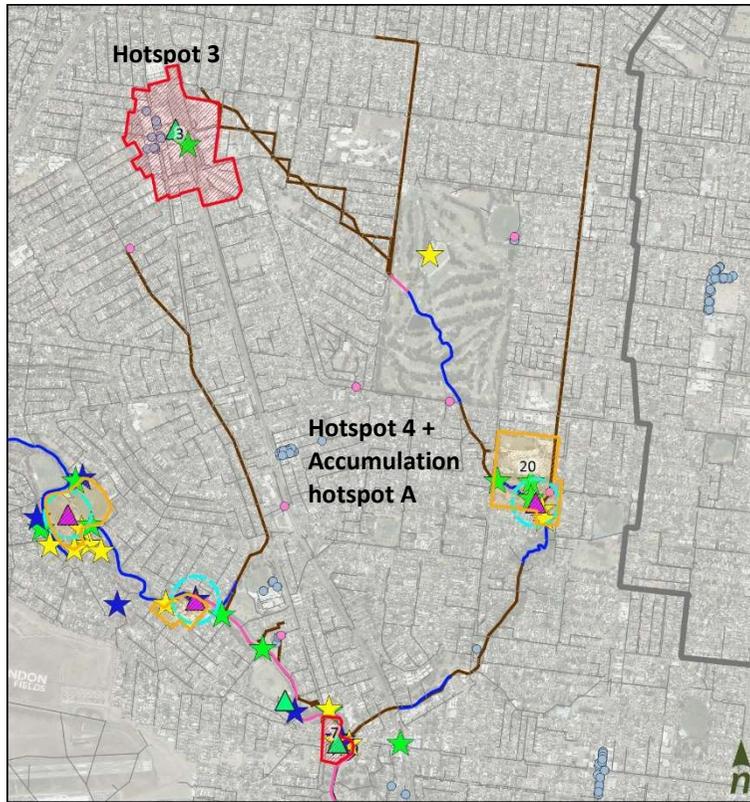
Known hotspot identified by Council. New development occurring and intersection of Parks Victoria and Melbourne Water. Resident complaints about the amount of litter against the fence line and polystyrene spill across the area.

Presence of GPT or WSUD assets

There are no known GPTs or WSUD assets capturing litter upstream of litter accumulation hotspot A, except for local drainage assets installed to receive stormwater/litter within local development.

Information on accumulation hotspot(s)

Community survey identified Hotspot A as local litter accumulation hotspot at Yuroke Creek below Somerton Road. Litter could be receiving from newer development and construction. Jacana Wetland may likely receive litter from this litter generation hotspot.



Legend

Community survey (no. of complaints)



Combined council and community

- ▲ Litter accumulation
- ▲ Litter generation
- ▲ Litter accumulation and generation

Litter generation hotspot areas (ID)

- Regionally significant
- Locally significant
- Regionally significant accumulation points

- GPTs (Melb Water + councils)
- WSUD assets (Melb Water + councils)
- Natural waterways
- Concrete channels
- Underground channels
- Relevant council pipes
- Council pipes
- Moonee Ponds Creek catchment
- Retarding Basin
- Stormwater Quality Systems
- Waterbodies

Description

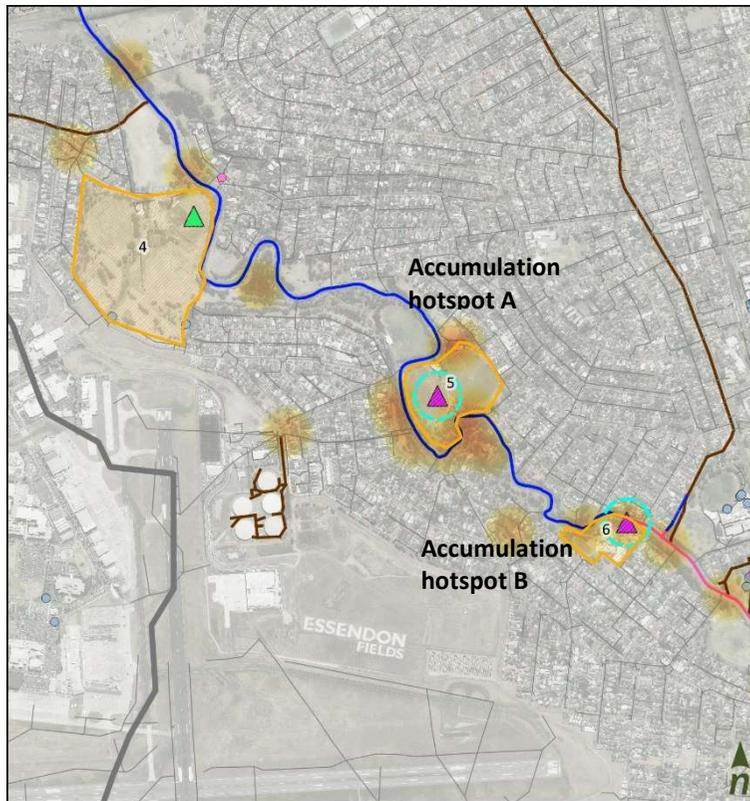
Location Hotspot 3 – Glenroy retail precinct (Westbreen Creek catchment)
Hotspot 20 – KW Joyce Reserve, south of Pascoe Vale Girls Secondary College

Level of significance Hotspot 3: Regionally significant hotspot
Hotspot 20: Locally significant hotspot

Rationale Glenroy retail and train station has been noted by Council that litter is likely to be generated from within the Westbreen Creek catchment. There are two underground pipes that pass stormwater runoff into Northern Golf Course. The pipes lead to an open concrete channel then as vegetated waterway before flowing into an underground concrete pipe again. The pipe then resurfaces as Westbreen Creek at KW Joyce where there are 6 litter complaints from residents and Council.

Presence of GPT or WSUD assets GPT: 1 GPT located along Rhodes Parade 1.8km DS of hotspot area, past Northern Golf Course – but unsure if it receives litter from Glenroy. Council commented there used to be a net GPT at the golf course but was removed when the pipes expanded. There are increased litter complaints since then. Another GPT at KW Joyce but community survey questioned the effectiveness of this GPT.
WSUD: 12 Council owned raingardens located within the hotspot – but not likely to treat litter.

Information on accumulation hotspot(s) Common litter types observed by community at KW Joyce Reserve includes recyclable plastics, soft plastics (e.g. charity bags) and cigarette butts. Several complaints at KW Joyce Reserve and comments have identified litter sources at Glenroy retail precinct (activity centre) and West Street Drain.



Legend

Community survey (no. of complaints)



Combined council and community

- ▲ Litter accumulation
- ▲ Litter generation
- ▲ Litter accumulation and generation

Litter generation hotspot areas (ID)

- Regionally significant
- Locally significant
- Regionally significant accumulation points

● GPTs (Melb Water + councils)

● WSUD assets (Melb Water + councils)

— Natural waterways

— Concrete channels

— Underground channels

— Relevant council pipes

— Council pipes

 Moonee Ponds Creek catchment

 Retarding Basin

 Stormwater Quality Systems

 Waterbodies

Description

Location
 Hotspot 4 – Boeing Reserve
 Hotspot 5 – John Pascoe Fawkner Reserve
 Hotspot 6 – Strathmore North Primary School

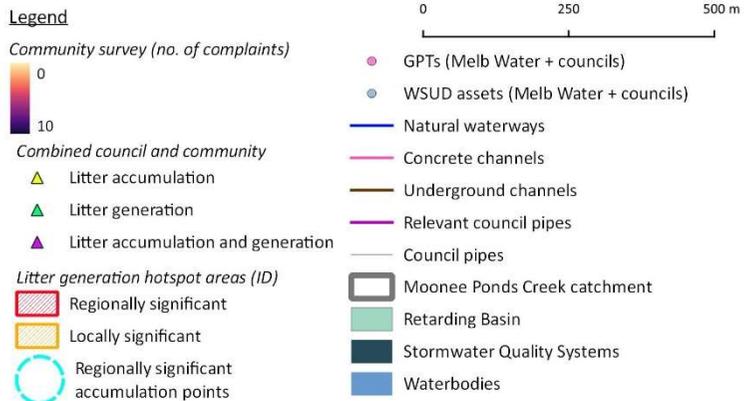
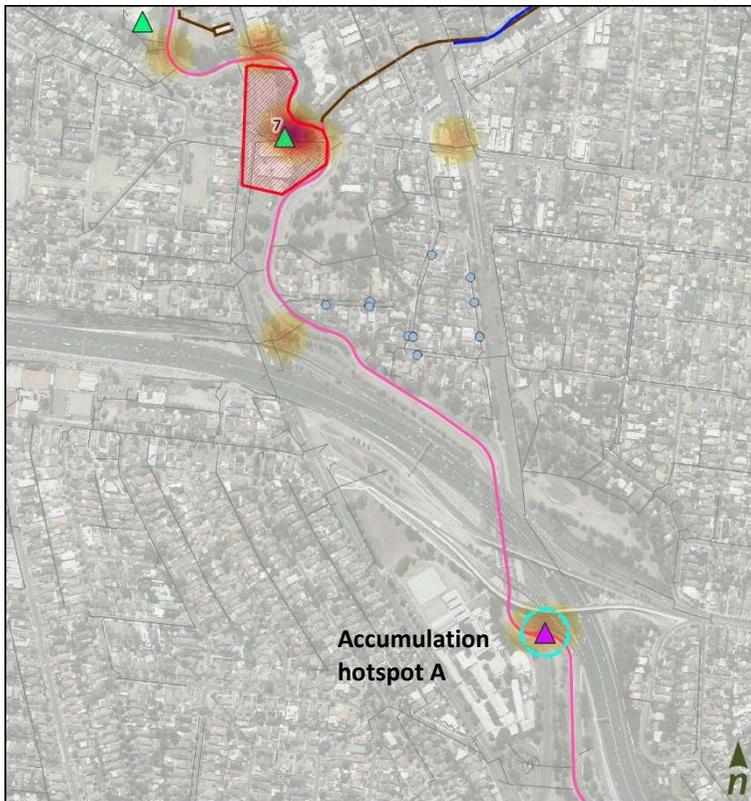
Level of significance
 Locally significant hotspot

Rationale

Boeing Reserve is identified as a public recreational zone with residents complaints. Litter is most likely generated in this hotspot as locally dropped litter in the carpark, after sporting events or use of linear park along MPC. Waterway is vegetated at this location so it may appear visible to residents. Similar to Boeing Reserve, John Pascoe Fawkner Reserve has high recreational activity that may generate litter at this location. Worth noting that there are 9 complaints received at JP Fawner Reserve as a 'popular dumping ground' and litter accumulation hotspot. At this hotspot, Moonee Ponds Creek is a vegetated waterway and it bends around the Reserve (slower energy) so it may deposit more litter and appear more visible to users of this area. Strathmore North Primary School hotspot area includes recreational trails along Moonee Ponds Creek. Schools generally not generally consider a significant litter generation source, as they are often well management, but in the case of Strathmore North Primary it has been included given the number of complaints and proximity to the waterway. It is reported to be a high traffic area with sports oval, busy shared trail. Possibly locally dropped.

Presence of GPT or WSUD assets
 GPT: No GPT or litter trap
 WSUD: No WSUD

Information on accumulation hotspot(s)
 Litter gets accumulated at these locations either from upstream or local litter, with a larger extent of local litter during sporting season. Litter type varies across community complaints but many identified consumer's litter (e.g. glass, aluminium, recyclable plastics, paper cardboard and soft plastics) as main litter types. John Pascoe Reserve (Hotspot 5) is also highlighted as 'regular dumping ground'. Strathmore North Primary undertook several clean up events at Hotspot 6.



Description

Location

Hotspot 7 – Mixed use zone at Gaffney Street, Pascoe Vale

Level of significance

Regionally significant hotspot

Rationale

This hotspot is a popular public and recreational area. There are a few eateries and high visitation in this section of the creek. We received seven complaints in this hotspot with food drive through and popular park trails. Community organised a number of clean up events (see photo below). Note that this is also the same area where Westbreen meets Moonee Ponds Creek, potentially bringing more litter into this section of Moonee Ponds Creek.

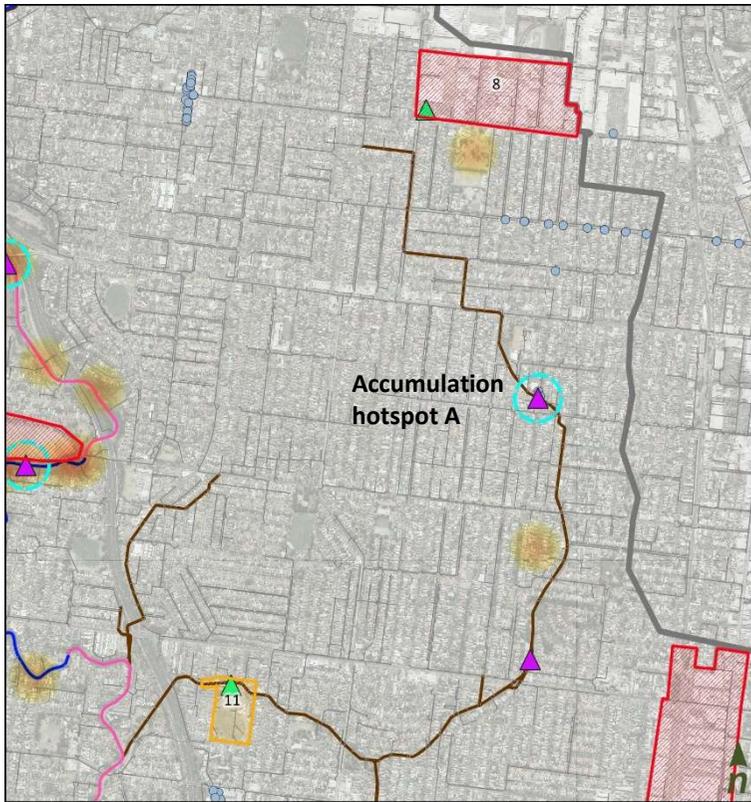
Presence of GPT or WSUD assets

GPT: No GPT or litter trap
 WSUD: No WSUD

Information on accumulation hotspot(s)

Litter is trapped at litter accumulation hotspot A where it is just downstream of the highway. Community survey responded litter is transported and accumulated at this location. Despite Moonee Ponds Creek being a concrete channel at this section, the bend of the river and community complaints suggest it is a repetitive litter accumulation hotspot.





Legend

Community survey (no. of complaints)



Combined council and community

- ▲ Litter accumulation
- ▲ Litter generation
- ▲ Litter accumulation and generation

Litter generation hotspot areas (ID)

- Regionally significant
- Locally significant
- Regionally significant accumulation points

- GPTs (Melb Water + councils)
- WSUD assets (Melb Water + councils)
- Natural waterways
- Concrete channels
- Underground channels
- Relevant council pipes
- Council pipes
- Moonee Ponds Creek catchment
- Retarding Basin
- Stormwater Quality Systems
- Waterbodies

Description

Location

Hotspot 8 – Coburg North Shopping Centre

Level of significance

Regionally significant hotspot

Rationale

Coburg North Shopping Centre precinct is one of the major shopping centres servicing the surrounding suburbs including Pascoe Vale. The precinct contains numerous takeaways shops, large open-air carpark and light industrial activities at the back of the shopping centre. It is also a busy transportation area with tram and train stations towards the east (not within the hotspot but close to this precinct).

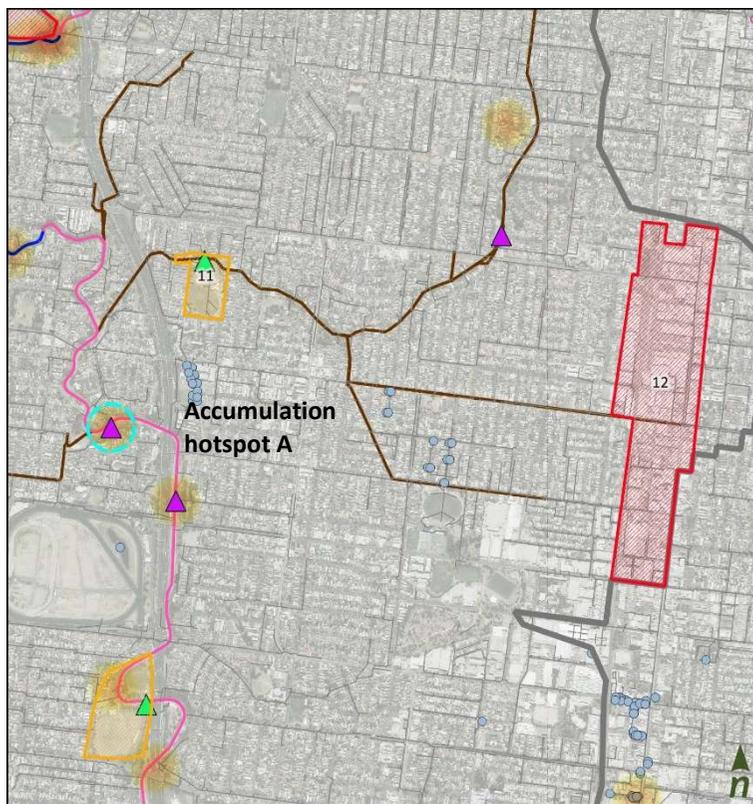
This precinct is part of the Let’s Strain the Drain project and there were 5 visits to collect litter. Litter data showed this site as the second highest average number of litter items (1,192) and average weight of litter recorded (6.78kg). Council pipes within the hotspot lead into a main underground pipe (Melville Main Drain) that runs south-easterly direction and turns into westerly direction before connecting to MPC just upstream of Albion Street.

Presence of GPT or WSUD assets

GPT: No GPT or litter trap
 WSUD: No WSUD

Information on accumulation hotspot(s)

There are 4 requests for service along or near Melville Main Drain between Bellevue Street and Munro Street.



Legend

Community survey (no. of complaints)



Combined council and community

- ▲ Litter accumulation
- ▲ Litter generation
- ▲ Litter accumulation and generation

Litter generation hotspot areas (ID)

- Regionally significant
- Locally significant
- Regionally significant accumulation points

● GPTs (Melb Water + councils)

● WSUD assets (Melb Water + councils)

— Natural waterways

— Concrete channels

— Underground channels

— Relevant council pipes

— Council pipes

 Moonee Ponds Creek catchment

 Retarding Basin

 Stormwater Quality Systems

 Waterbodies

Description

Hotspot 11 – Dunstan Reserve

Location

Hotspot 12 – Sydney Road shopping precinct

Level of significance

Hotspot 11: Local significant hotspot

Hotspot 12: Regionally significant hotspot

Rationale

Hotspot 11: This is a public recreational zone where the Brunswick City soccer club resides. There is an underground pipe that passes through the reserve and connects with Moonee Ponds Creek (Melville Main Drain). There were 5 requests for service at this location

Hotspot 12: Sydney Road shopping precinct is a main commercial activity within the Moreland Council area with one busy tram line running along Sydney Road and two train stations (Moreland and Anstey). There are five Let's Strain the Drain visits at Sydney Road which recorded the third highest average litter items (434.6) and third highest average weight of litter items (2.376kg) recorded within the MPC catchment (MW dataset). Let's strain the Drain identified this location as a litter generation. There is one direct underground pipe at Albion Street that connects directly to MPC and there is another underground pipe 300m away from the hotspot along Hope Street that may facilitate litter movements into MPC.

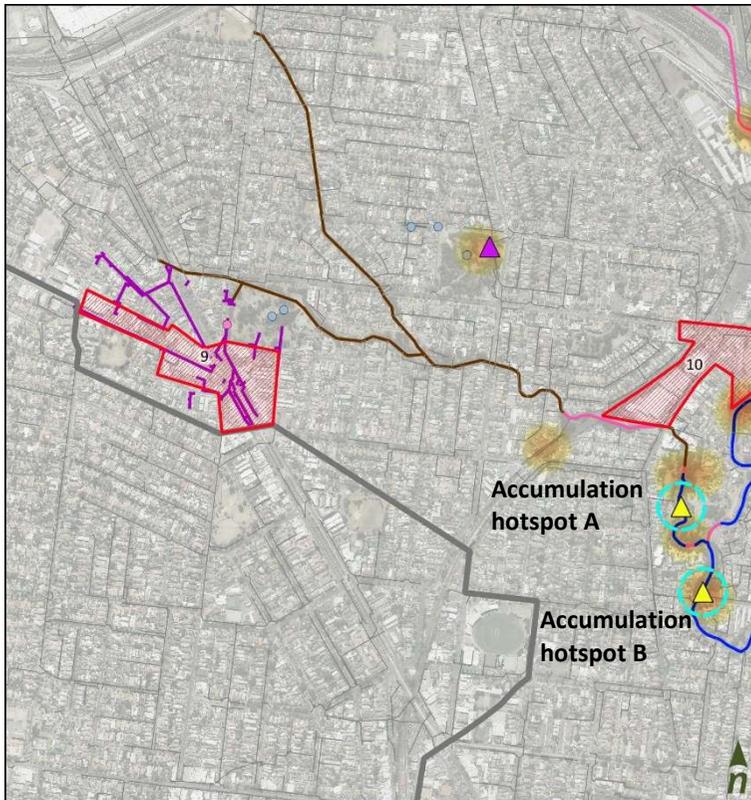
Presence of GPT or WSUD assets

GPT: No GPT or litter trap

WSUD: No WSUD

Information on accumulation hotspot(s)

Community survey responded that polystyrene and recycled plastic bottles as most obvious types of litter. While this hotspot is along the concrete section of the channel, we received responses that litter is most prevalent after rain events and tend to wash further down unless collected manually. This hotspot also receives litter from litter generation Hotspot 13-15 (Moonee Ponds Shopping Precinct) and any litter from upstream.



Legend

Community survey (no. of complaints)



Combined council and community

▲ Litter accumulation

▲ Litter generation

▲ Litter accumulation and generation

Litter generation hotspot areas (ID)

Regionally significant

Locally significant

Regionally significant accumulation points

● GPTs (Melb Water + councils)

● WSUD assets (Melb Water + councils)

— Natural waterways

— Concrete channels

— Underground channels

— Relevant council pipes

— Council pipes

Moonee Ponds Creek catchment

Retarding Basin

Stormwater Quality Systems

Waterbodies

0 250 500 m

Description

Location

Hotspot 9 – Keilor Road (Essendon) Shopping Precinct

Level of significance

Regionally significant hotspot

Rationale

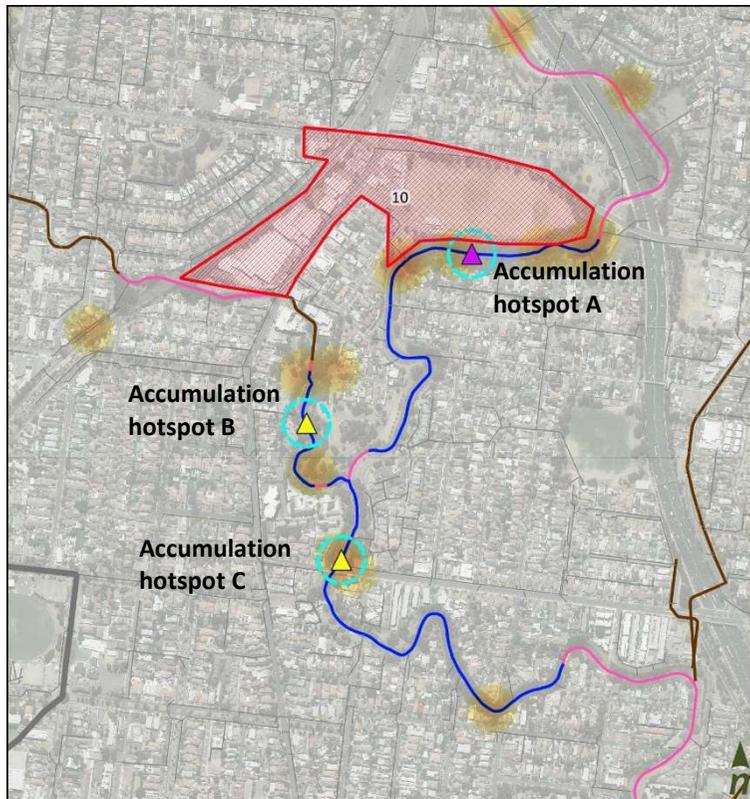
This hotspot is a high commercial activity with presence of trams stops along Keilor Road and along Mt Alexander Road. Council pipes from this hotspot connect to an underground pipe (Five Mile Creek) that runs easterly direction before connecting to MPC.

Presence of GPT or WSUD assets

GPT: 1 Council-owned GPT, described as 'Large GPT'.
WSUD: 2 Melbourne Water-owned WSUD assets at Woodlands Park as part of Melbourne Water's Living Rivers project. Assets are named as 'Woodlands Park Stormwater Treatment and Harvesting System'.

Information on accumulation hotspot(s)

Numerous community and council members commented on the large litter accumulation point at the outlet of Five Mile Creek where it joins in with Moonee Ponds Creek (Accumulation hotspot A). Litter is more obvious after high flow events, especially plastics products (soft and hard), polystyrene and to a less extent occurrence of aluminium cans and building construction materials. Same reasoning apply to Accumulation hotspot B.



Legend

Community survey (no. of complaints)



Combined council and community

- ▲ Litter accumulation
- ▲ Litter generation
- ▲ Litter accumulation and generation

Litter generation hotspot areas (ID)

- Regionally significant
- Locally significant
- Regionally significant accumulation points

- GPTs (Melb Water + councils)
- WSUD assets (Melb Water + councils)
- Natural waterways
- Concrete channels
- Underground channels
- Relevant council pipes
- Council pipes
- Moonee Ponds Creek catchment
- Retarding Basin
- Stormwater Quality Systems
- Waterbodies

Description

Location Hotspot 10 – Cross Keys oval and Reserve

Level of significance Regionally significant hotspot

Rationale Cross Keys oval

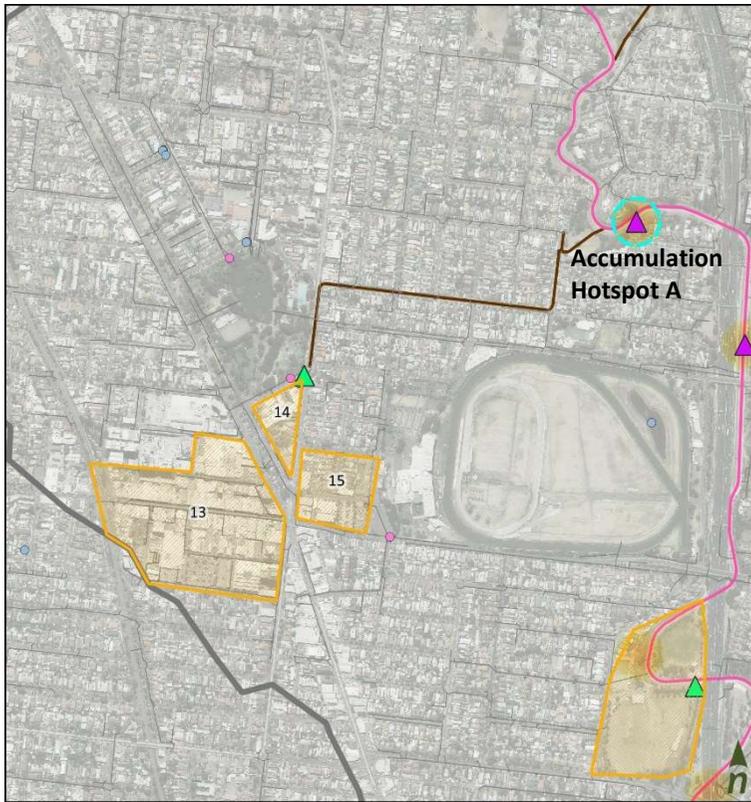
Presence of GPT or WSUD assets GPT: No GPT or litter trap
WSUD: No WSUD

Information on accumulation hotspot(s)

There were 10 community/councils' complaints at Accumulation hotspot A. Accumulation hotspot A is located at the vegetated section of Moonee Ponds Creek where most litter would be deposited after travelling through the concrete section of the Creek. This would be a very visible accumulation point as the river slows down when it hits the vegetation section, likely to deposit large amount of litter during high flow events. This hotspot is also a litter generation hotspot where there is high level of activities such as Cross Keys Reserve, takeaway shops, car park. High level of visitation means more visible litter are observed, together with large deposits of litter along the vegetation section.

Accumulation hotspot B and C are hotspots where Five Mile Creek outlet meets Moonee Ponds Creek and immediately downstream of the confluence. These were noted in the Litter generation Hotspot 9 – Keilor Road (Essendon) shopping precinct.





Legend

Community survey (no. of complaints)



Combined council and community

- ▲ Litter accumulation
- ▲ Litter generation
- ▲ Litter accumulation and generation

Litter generation hotspot areas (ID)

- Regionally significant
- Locally significant
- Regionally significant accumulation points

● GPTs (Melb Water + councils)

● WSUD assets (Melb Water + councils)

— Natural waterways

— Concrete channels

— Underground channels

— Relevant council pipes

— Council pipes

 Moonee Ponds Creek catchment

 Retarding Basin

 Stormwater Quality Systems

 Waterbodies

Description

Location

Hotspot 13-14 – Moonee Ponds shopping precinct

Level of significance

Locally significant hotspot

Rationale

Moonee Ponds shopping precinct is a commercial zone includes Moonee Ponds shopping strip, bus terminals, Moonee Ponds train station and major road along Mt Alexander Road. There is no complaint here but there has been 9 litter for request at this commercial and transport hub. Council pipes from this hotspot directly flows into Melbourne Water’s underground pipe system and into the concrete section of the MPC.

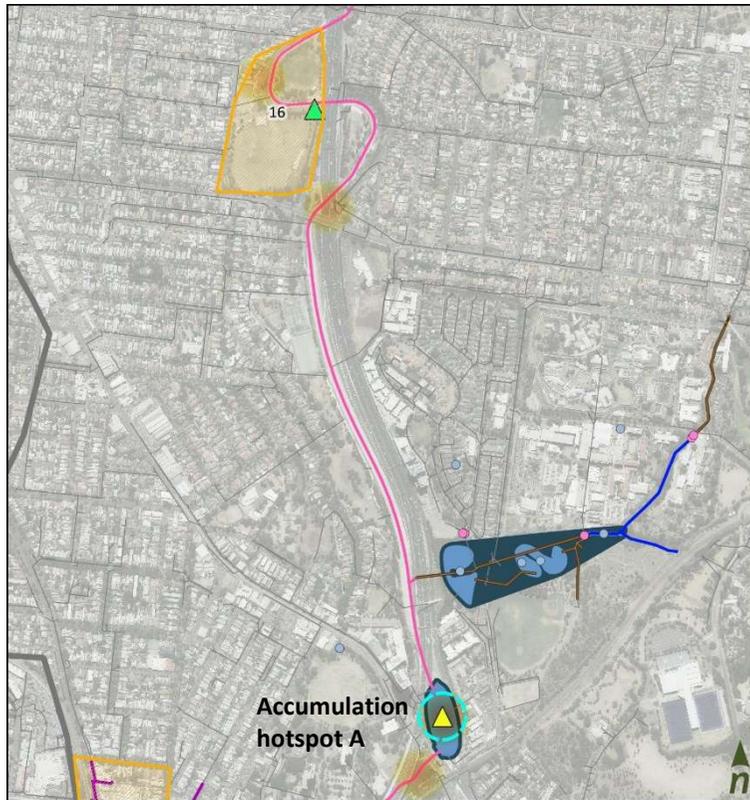
Presence of GPT or WSUD assets

GPT: 2 Council owned GPT potentially treating Hotspot 14 and 15

WSUD: No WSUD

Information on accumulation hotspot(s)

Accumulation hotspot A is the same accumulation hotspot as in Hotspot 11 and 12. Litter is accumulated from the pin all the way along the concrete drain to underpass at Dawson Street. Community complaints identified polystyrene and recyclable plastic bottles as most prevalent.



Legend

Community survey (no. of complaints)



Combined council and community

- ▲ Litter accumulation
- ▲ Litter generation
- ▲ Litter accumulation and generation

Litter generation hotspot areas (ID)

- Regionally significant
- Locally significant
- Regionally significant accumulation points

● GPTs (Melb Water + councils)

● WSUD assets (Melb Water + councils)

— Natural waterways

— Concrete channels

— Underground channels

— Relevant council pipes

— Council pipes

 Moonee Ponds Creek catchment

 Retarding Basin

 Stormwater Quality Systems

 Waterbodies

0 250 500 m

Description

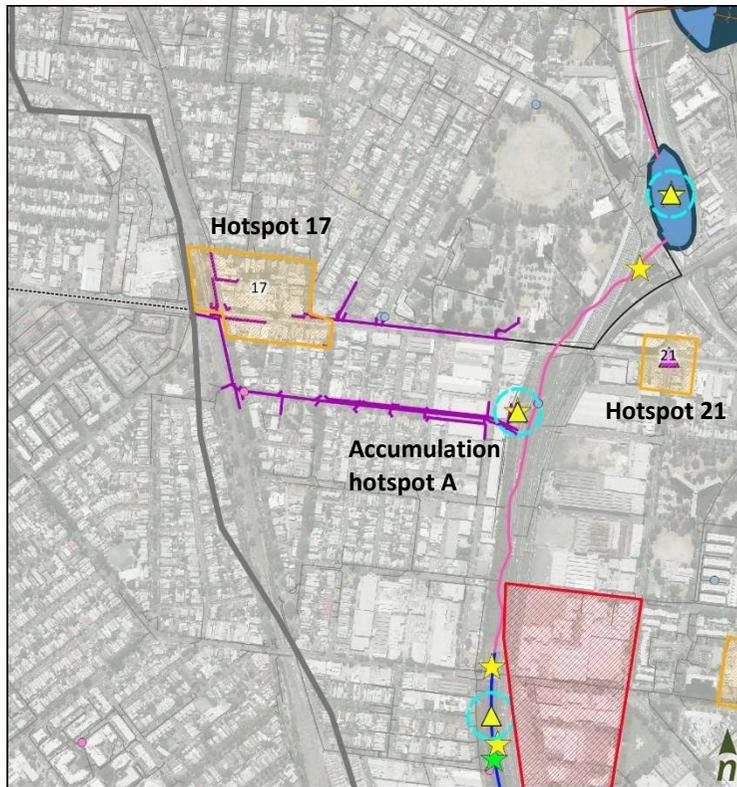
Location Hotspot 16 – Ormond Park (Moonee Valley Football Club and other footy clubs)

Level of significance Locally significant hotspot

Rationale This hotspot is a popular public recreation zone that includes at least 5 sporting clubs and carparks for these two sporting ovals. Two resident complaints and three request for service (litter removal) at this hotspot.

Presence of GPT or WSUD assets GPT: No GPT or litter trap
 WSUD: 1 Melbourne Water-owned stormwater quality system at Moonee Ponds Creek Lake (at accumulation hotspot A)

Information on accumulation hotspot(s) Community complaints commented that litter seems to be washed down from the creek and collects at Accumulation hotspot A. This hotspot has the potential to attract litter offenders who would throw larger items into the pond. Worth noting that Royal Park Main Drain also drains into the system but has multiple WSUD assets just upstream of the confluence, potentially stopping litter from entering Accumulation hotspot A.



Legend

Community survey (no. of complaints)



Combined council and community

- ▲ Litter accumulation
- ▲ Litter generation
- ▲ Litter accumulation and generation

Litter generation hotspot areas (ID)

- Regionally significant
- Locally significant
- Regionally significant accumulation points

- GPTs (Melb Water + councils)
- WSUD assets (Melb Water + councils)
- Natural waterways
- Concrete channels
- Underground channels
- Relevant council pipes
- Council pipes
- Moonee Ponds Creek catchment
- Retarding Basin
- Stormwater Quality Systems
- Waterbodies

Description

Hotspot 17 – Newmarket shopping precinct
 Hotspot 21 – Racecourse Rd/Boundary Rd

Level of significance

Locally significant hotspots

Rationale

Hotspot 17 is a main commercial activity within Newmarket retail strip that includes Newmarket train station, commercial strip and main road (Racecourse Road). There are council pipes that connect directly from this hotspot to MPC. One of the major council pipe connection goes out to Racecourse Road litter trap.

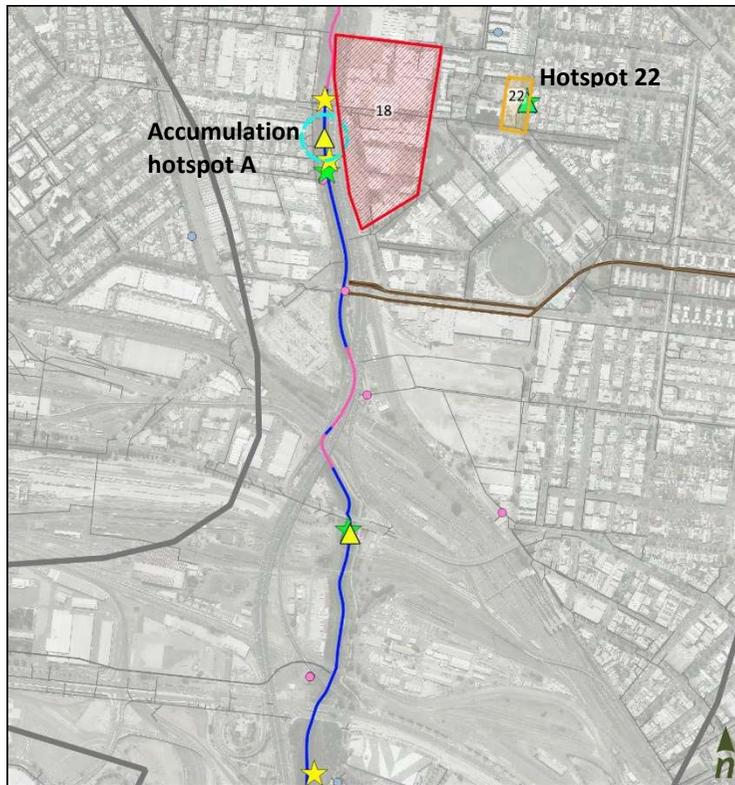
Hotspot 21 is located at a busy junction with the freeway exit towards the North. It has a few takeaway stores, light industrial and car parking spaces in the vicinity. Council identified this hotspot as a locally significant one. Hotspot 21 has council pipes leading directly into Moonee Ponds Creek above accumulation hotspot A.

Presence of GPT or WSUD assets

GPT: No GPT or litter trap at Hotspot 17, but there is one litter trap at Accumulation Hotspot A (Racecourse Road)
 WSUD: No WSUD

Information on accumulation hotspot(s)

Racecourse Road litter trap is recognised as a repetitive accumulation point for community and council members. This hotspot A receives litter that otherwise haven't been captured upstream. Litter generated from Newmarket precinct is likely to be deposited into Accumulation hotspot A. There has been community complaints of poor design and infrequent litter collection.



Legend

Community survey (no. of complaints)



Combined council and community

- ▲ Litter accumulation
- ▲ Litter generation
- ▲ Litter accumulation and generation

Litter generation hotspot areas (ID)

- Regionally significant
- Locally significant
- Regionally significant accumulation points

- GPTs (Melb Water + councils)
- WSUD assets (Melb Water + councils)
- Natural waterways
- Concrete channels
- Underground channels
- Relevant council pipes
- Council pipes
- Moonee Ponds Creek catchment
- Retarding Basin
- Stormwater Quality Systems
- Waterbodies

Description

Location
Hotspot 18 – Macaulay industrial precinct
Hotspot 22 – Melrose Street local retail strip

Level of significance
Hotspot 18: Regionally significant hotspot
Hotspot 22: Locally significant hotspot

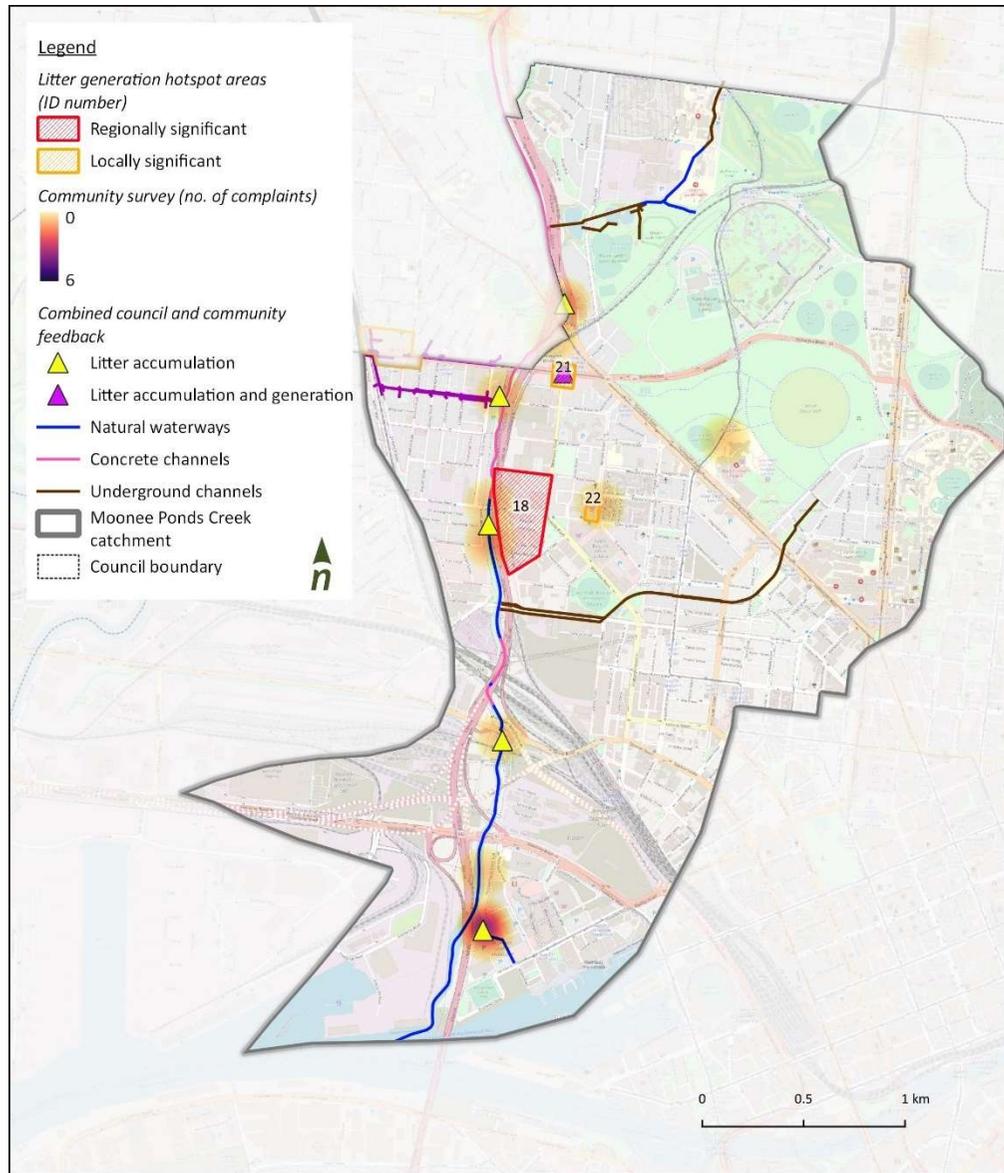
Rationale
Macaulay industrial precinct is a commercial and industrial zone with Macaulay train station and highways.
Melrose Street local retail strip was identified by Council as a persistent litter hotspot. It has a few takeaway stores, convenience shops and supermarkets along with on-street parking. Community also complained of litter generation at this hotspot. This hotspot has council pipes leading directly into Hotspot 18 and into the outlet to Moonee Ponds Creek upstream of Macaulay Road bridge.

Presence of GPT or WSUD assets
GPT: 1 Council-owned litter trap downstream of Hotspot 18, more likely treating one of the council pipe outlets than the main Moonee Ponds Creek. No GPT at Hotspot 22
WSUD: No WSUD

Information on accumulation hotspot(s)
Received few community complaints at Accumulation hotspot A. This hotspot has high density of stormwater outlets located across this section of the Creek. Litter that bypasses Racecourse Road litter stream travels to this hotspot. Kensington pumping outlet also pumps stormwater into this location, adding more litter into the accumulation point. It is likely to be visible for users as it is close to Macaulay Bridge and Moonee Ponds Creek trails. It is likely to receive more litter during high rainfall/flow events. Most frequent litter observed was glass, recyclable soft and hard plastics and cigarette butts.



Attachment D
Litter hotspots maps and details– by council



City of Melbourne

Litter complaints from council and community feedback occur along the vegetated section of Moonee Ponds Creek.

Highest number of complaint were at bottom section system near Docklands where a significant amount of the litter from upstream is believed to sit in the side drain and circulate in the estuary.

One **regionally** significant litter generation hotspots in Moonee Valley City Council:

18. Macaulay station precinct

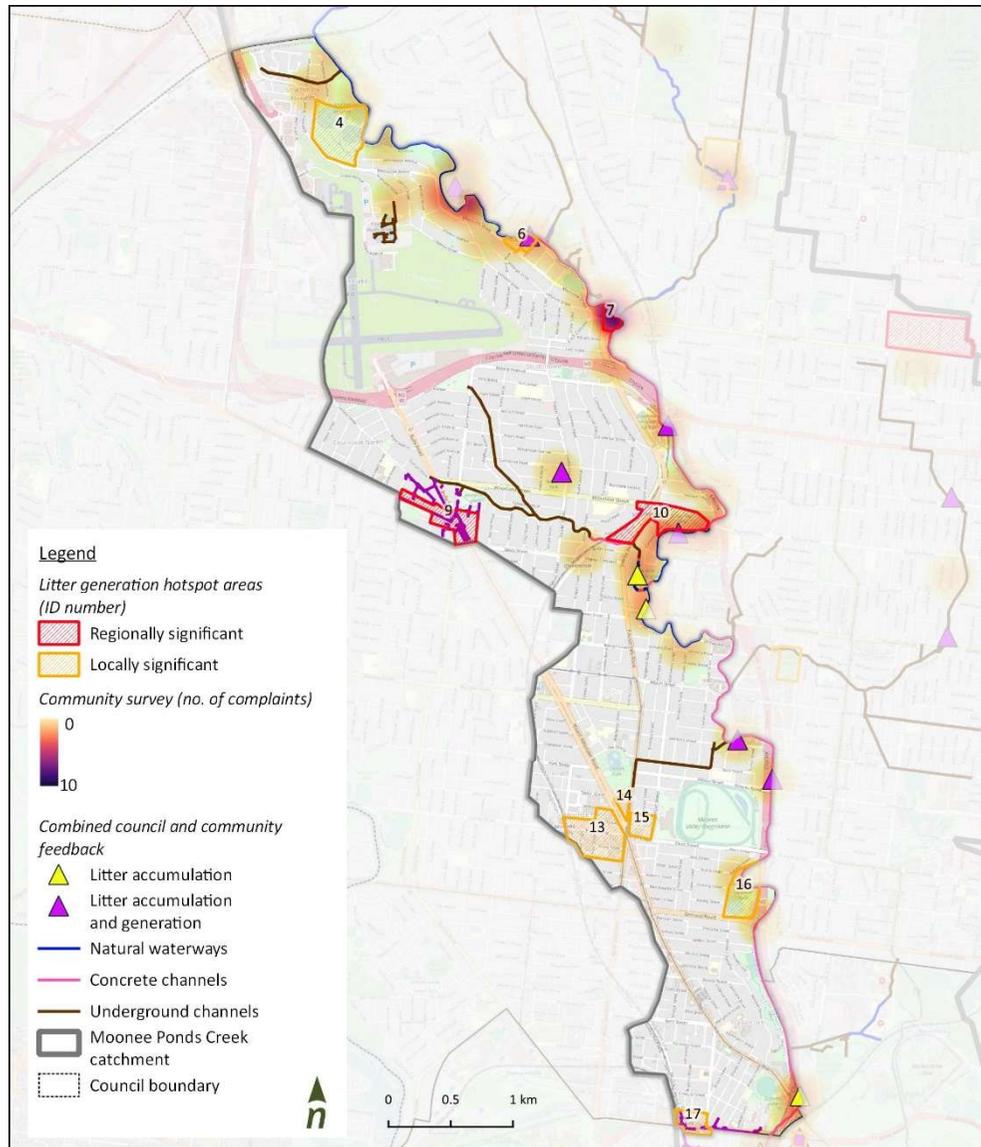
Racecourse road litter trap is a highly visible litter infrastructure site that generate a significant number of complaints for councils and MW

Two **locally** significant litter generation hotspots:

21. Racecourse Road/Boundary Road

22. Melrose Street local retail precinct.

Note: the Newmarket retail precinct - local litter generation hotspot in MVCC area - feeds into Racecourse Road litter trap



Moonee Valley City Council

Community complaints data shows a mix of litter generation and accumulation points. Accumulation sites are generally in the vegetated section of the waterway with the presence of trails and parks and therefore higher visitation.

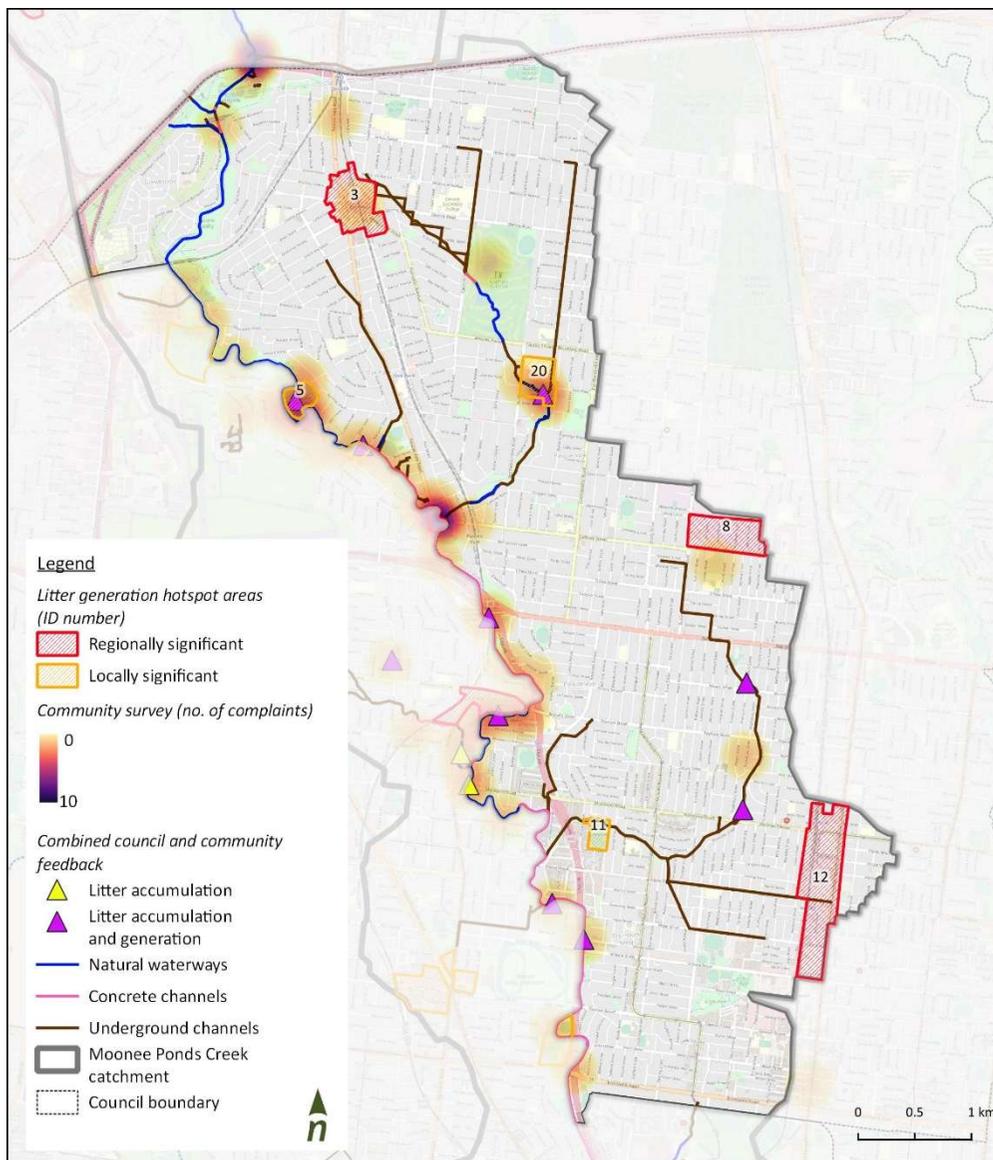
GIS analysis indicates that litter generated from the litter generation hotspots travels downstream via underground pipes into Moonee Ponds Creek.

Three **regionally** significant litter generation hotspots:

- 7. Pascoe Vale Rd/Gaffney Rd intersection
- 10. Cross Keys Oval/Strathmore station
- 9. Keilor Road shopping precinct

Seven **locally** significant litter generation hotspots:

- 4. Boeing Reserve
- 6. Strathmore North Primary School
- 13/14/15. Moonee Ponds retail precincts
- 16. Ormond Park
- 17. Racecourse Rd/Newmarket retail precinct



Moreland City Council

Community complaints data shows a mix of litter generation and accumulation points along this section of Moonee Ponds Creek. Accumulation sites are generally in the vegetated section of the waterway.

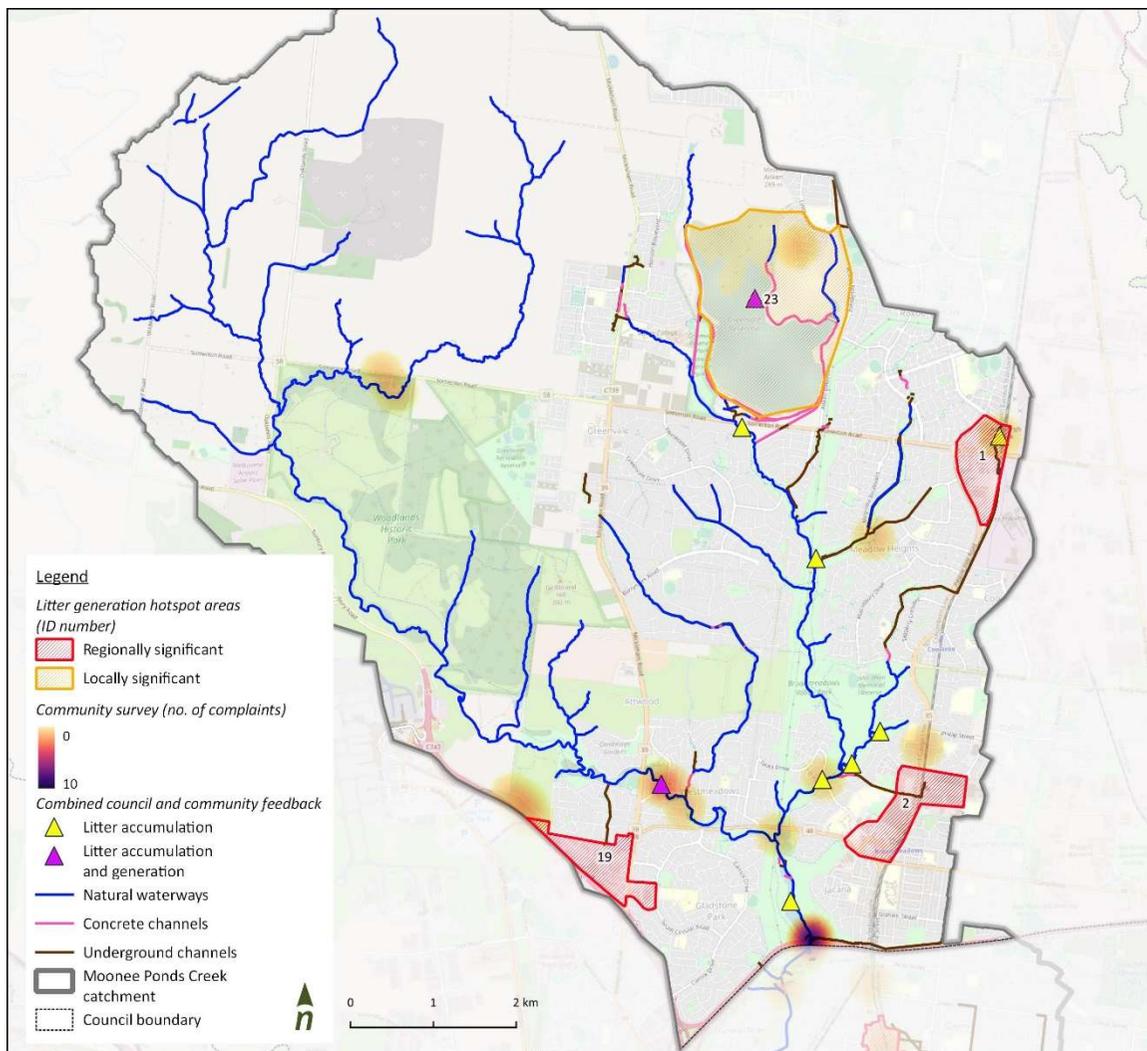
GIS analysis indicates that litter generated from litter the litter generation hotspots travels downstream via underground pipes into Moonee Ponds Creek.

Three **regionally** significant litter generation hotspots:

- 3. Glenroy retail precinct
- 8. Coburg North shopping precinct
- 12. Sydney Road shopping precinct

Three **locally** significant litter generation hotspots:

- 5. John Pascoe Fawkner Reserve
- 11. Dunstan Reserve
- 20. KW Joyce Reserve



City of Hume

Community complaints occurred predominately in the urbanised reached of the area.

GIS analysis showed the majority of litter accumulation hotspots are located directly downstream of one or more litter generation hotspots, with most complaints occurring at the 'choke' point at Jacana Wetland.

Three **regionally** significant litter generation hotspots:

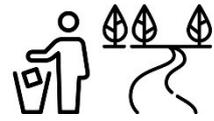
1. Roxburgh Park shopping precinct
2. Broadmeadows shopping precinct
19. Melbourne Airport waiting areas (Mickleham Rd)

One locally significant litter generation hotspot:

23. Greenvale Reservoir/Reserve

Attachment E

Community and stakeholder survey templates



Moonee Ponds Catchment Litter Project

Litter management survey for Melbourne Water

Litter management survey

This survey is part of a strategic litter investigation across the entire Moonee Ponds Creek catchment. The survey is designed to gain a joint understanding of commonalities and differences in aims and approaches between agencies to inform the development of a coordinated collaborative whole of catchment plan.

The purpose of this survey is to understand:

- why agencies invest in litter management and how they prioritise their investment
- current litter management practices and hotspots

Alongside this survey is a separate - community groups survey - to understand community perceptions of litter issues.

Project definition of litter:

Any discarded, disposed of, or abandoned man-made objects and organic material that is present on land and in water. It consists of articles that have been made or used by people or businesses and subsequently deliberately discarded or accidentally lost. Examples include, but are not limited to, any waste glass, metal, plastic, paper, fabric, wood, trolleys, microplastics, cigarette butts, medical waste, household items, food, soil, sand, concrete or rocks, abandoned vehicles, abandoned vehicle parts, syringes, polystyrene, electronic wastes and garden remnants and clippings. It does not include natural occurring litter such as leaf litter and stormwater debris.

Data submission

Please return the completed survey to: ying.quek@alluvium.com.au by **29th May 2020**.

Associated data (e.g. reports and GIS files) can be uploaded to the following Sharepoint location:

https://alluvium-my.sharepoint.com/:f/g/personal/yquek_alluvium_com_au/EnOY82xdINBLj6s6u3YInIIBO8vhSzInFEMpPb-xnOJLeg?e=e8L4d0

GIS files can be accepted as Tab or Shapefiles.

Questions? Please contact: Ying Quek on 0451 114 770

Data request

Please provide the following spatial data in GIS format:

- Moonee Ponds Creek and its subcatchments boundaries
- customer complaint data (if available in GIS)
- drainage network (pipes and pits)
- open channel and waterway network

How we will use it:

To understand litter movement patterns
To help understand relationships between litter hotspots and land use.

- Melbourne Water owned land
- paths (shared and walking) To identify likely amenity hotspots

Aims, drivers, values and audience

Is there a vision that directs your investment in litter management? And/or if there is no vision articulated can you explain how your agency judges the success of its litter management program?

What drives your agency's involvement in litter management? 1 = not a driver, 10 = significant driver

Obligation under legislation <input type="checkbox"/> 10 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>
Being a good corporate citizen <input type="checkbox"/> 10 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>
Protecting the environment <input type="checkbox"/> 10 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>
Improving local amenity/cleanliness <input type="checkbox"/> 10 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>
Safety e.g managing sharps <input type="checkbox"/> 10 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>
Drainage performance <input type="checkbox"/> 10 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>
Reducing complaints <input type="checkbox"/> 10 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>
Past practice <input type="checkbox"/> 10 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>
Other: <input type="checkbox"/> 10 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>

If the drivers differ across your agency, please describe how they differ.

What values is your agency aiming to protect through its investment in litter management? 1 = not an important value, 10 = significant value

Local amenity <input type="checkbox"/> 10 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>
Safety <input type="checkbox"/> 10 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>
Local environmental values <input type="checkbox"/> 10 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>
Waterways <input type="checkbox"/> 10 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>
Port Phillip Bay <input type="checkbox"/> 10 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>
Other: <input type="checkbox"/> 10 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>

If the values differ across your agency, please describe how they differ.

Who is the audience for your agency considers in the design of its litter management program? If the audiences differs, please describe how they differs and who is the predominant audience is.

Understanding investment in litter

What is the total annual operational budget for litter management within your agency (including managing dumped rubbish)?	\$	
Please identify the breakdown of litter management expenditure. Use the categories below or specify your own categories if appropriate:		
Category	\$/annum	Volume of litter collected
Dumped rubbish		
Disposal costs/tipping fees		
Management of GPTs		
Education/behaviour change programs		
Litter pick-up programs		
Other:		
Other:		
Other:		
What is the total annual capital budget for litter management within your agency?		
\$		
Please outline what the capital investment is planned to deliver:		

Understanding where and when you focus litter management

Describe your agency's role in litter education/preventative/behaviour change programs. Are there community or education programs Melbourne Water supports/facilitates? What do they aim to achieve? Do you target different community segments differently? Please describe how they differ.



How do you set levels of service of when to collect litter across different land uses and assets? Does the trigger for litter collection vary between different land uses?

For example: 'For wetlands: we will not visit sites more than monthly because we want to keep at this activity level' vs 'we will not collect litter/not considered as a litter problem until the site get x loads of litter'

Litter traps: _____

Wetlands: _____

Retarding basins: _____

Melbourne Water land: _____

Along waterways: _____

Other: _____

Litter management - Asset data collection

Question:	Council data to be provided	Council explanation of data provided:	Best council contact(s) for follow up questions relating to data (
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Existing maintenance activities with frequency and volumes collected.			
Stormwater quality asset (sediment ponds, wetlands, other WSUD assets) cleaning information	GIS file (or a marked-up map/list) of locations with routes and information on the: <ul style="list-style-type: none"> frequency of cleaning e.g. maintenance schedule related litter data e.g. common litter type and volumes collected. PLUS Please use the hotspot survey link https://arcg.is/00TfH8 to mark any litter hotspots that you are aware of from the street sweeping program within the Moonee Ponds catchment.	File name(s): <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ Please explain the data provided to assist our interpretation: _____ _____ _____	Name: Position: Phone number: Email:
Stormwater drainage asset (Retarding basin) cleaning information	GIS file (or a marked-up map/list) of locations with routes and information on the: <ul style="list-style-type: none"> frequency of cleaning e.g. maintenance schedule related litter data e.g. common litter type and volumes collected. PLUS Please use the hotspot survey link: https://arcg.is/00TfH8 to mark any litter hotspots that you are aware of from the foot path cleaning program within the Moonee Ponds catchment.	File name(s): <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ Please explain the data provided to assist our interpretation of the data: _____	Name: Position: Phone number: Email:

		<hr/> <hr/>	
Litter collection beside waterways	<p>GIS file (or a marked-up map/list) of locations with bin locations and information on the:</p> <ul style="list-style-type: none"> frequency of cleaning e.g. maintenance schedule related litter data e.g. common litter type and volumes collected. <p>PLUS Please use the hotspot survey link https://arcg.is/00TfH8 to mark any litter hotspots that you are aware of from the street bin emptying program.</p>		
Other litter cleaning information i.e. where litter needs to be clean up manually in public areas such as parks and sports fields, know regular “litter hotspots” such as common dumping points) or after events.	<p>GIS file (or a marked-up map/list) of locations with locations and information on the:</p> <ul style="list-style-type: none"> frequency of cleaning (maintenance schedule) available litter data e.g. common litter type and volumes collected. cause of the litter <p>PLUS Please use the hotspot survey link https://arcg.is/00TfH8 to mark any litter hotspots that you are aware of from the litter cleaning program within the Moonee Ponds catchment.</p>	<p>File name(s):</p> <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <p>Please explain the data provided to assist our interpretation of the data:</p> <hr/> <hr/> <hr/> <hr/>	<p>Name:</p> <p>Position:</p> <p>Phone number:</p> <p>Email:</p>
Litter trap	<p>GIS file (or a marked-up map/list) of locations with locations and information on the:</p> <ul style="list-style-type: none"> frequency of cleaning (maintenance schedule) available litter data e.g. common litter type and volumes collected. include any observations on the effectiveness of each trap and the likely origin of litter collected. <p>PLUS Please use the hotspot survey link https://arcg.is/00TfH8 to mark any litter hotspots that you are aware of from the litter trap program within the Moonee Ponds catchment.</p>	<p>File name(s):</p> <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <p>Please explain the data provided to assist our interpretation of the data:</p> <hr/> <hr/> <hr/> <hr/>	<p>Name:</p> <p>Position:</p> <p>Phone number:</p> <p>Email:</p>
MW land cleaning information	<p>GIS file (or a marked-up map/list) of locations with locations and information on the:</p> <ul style="list-style-type: none"> frequency of cleaning (maintenance schedule) available litter data e.g. common litter type and volumes collected. include any observations on the effectiveness of each trap and the likely origin of litter collected. 	<p>File name(s):</p> <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <p>Please explain the data provided to assist our</p>	

		interpretation of the data: _____ _____ _____	
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Additional litter hotspot data collection

In addition to the hotspots identified through the analysis of litter collection data above please outline other litter generation or accumulation hotspots across your boundaries. Please include staff observation, litter survey results and or customer compliant data to provide the project team with a complete picture of the litter hotspots with the within the Moonee Ponds catchment. Please use the hotspot survey link: <https://arcg.is/00TfH8>.

Please list and provide copies of past litter assessment/surveys that will help us understand litter hotspots

File names:

Additional questions

What other groups and agencies are involved in on-ground litter collection in your area? Describe how coordination operates between them in responding to and communicating to community about litter management?

Are there any current litter planning/management projects or issues that your agency is currently aware of and/or working on?

What do you consider to be the main litter issues in Moonee Ponds catchment? Is this anecdotal or based on research/data that you have conducted?

What initiatives do you think would make the greatest improvements to litter management?

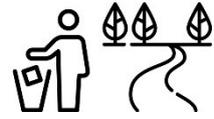
What initiatives do you think could most successfully be undertaken in coordination across this Moonee Ponds partnership?

In previous litter investigation work within the Moonee Ponds catchment (Hoffmans drain project) the key litter generation was found to be from building site runoff and the mishandling of litter collection from commercial sites. Do you think these issues are likely to be significant within your management area?

Is there any other information you would like to share with us to inform the system wide approach to litter management in Moonee Ponds Catchment?

Please list and provide copies of any research/ strategies/policy/management plans that will help us understand litter management in your agency.

File names:



Moonee Ponds Catchment Litter Project

Litter management survey for councils

Litter management survey

This survey is part of a strategic litter investigation across the entire Moonee Ponds Creek catchment. The survey is designed to gain a joint understanding of commonalities and differences in aims and approaches between agencies to inform the development of a coordinated collaborative whole of catchment plan.

The purpose of this survey is to understand:

- c. why agencies invest in litter management and how they prioritise their investment
- d. current litter management practices and hotspots

Alongside this survey is a separate - community groups survey - to understand community perceptions of litter issues.

Project definition of litter:

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Data submission

Please return the completed survey to: ying.quek@alluvium.com.au by **29th May 2020**.

Associated data (e.g. reports and GIS files) can be uploaded to the following Sharepoint location:

https://alluvium-my.sharepoint.com/:f/g/personal/yquek_alluvium_com_au/EnOY82xdINBLj6s6u3YInIIBO8vhSzInFEMpPb-xnOJLeg?e=e8L4d0

GIS files can be accepted as Tab or Shapefiles.

Questions? Please contact: Ying Quek on 0451 114 770

Data request

Please provide the following spatial data in GIS format: How we will use it:

- | | |
|---|--|
| <ul style="list-style-type: none">• Council boundary• urban footprint• future land development• active building applications and permits• drainage network (pipes and pits) | <p>Understand volume and spread of potential key litter generation source.</p> <p>Understand spread of potential key litter source</p> <p>To understand litter movement patterns</p> |
|---|--|

- land use To help understand relationships between litter hotspots and land use.
 - open space network (active and passive)
 - paths (shared and walking) To identify likely amenity hotspots
 - trails

Aims, drivers, values and audience

Is there a vision that directs your investment in litter management? And/or if there is no vision articulated can you explain how your agency judges the success of its litter management program?

What drives your agency's involvement in litter management? 1 = not a driver, 10 = significant driver

Obligation under legislation	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>
<input type="checkbox"/> 10 <input type="checkbox"/>									
Being a good corporate citizen	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>
<input type="checkbox"/> 10 <input type="checkbox"/>									
Protecting the environment	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>
<input type="checkbox"/> 10 <input type="checkbox"/>									
Improving local amenity/cleanliness	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>
<input type="checkbox"/> 10 <input type="checkbox"/>									
Safety e.g managing sharps	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>
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Drainage performance	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>
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Reducing complaints	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>
<input type="checkbox"/> 10 <input type="checkbox"/>									
Past practice	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>
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Other:	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>
<input type="checkbox"/> 10 <input type="checkbox"/>									

If the drivers differ across your agency, please describe how they differ.

What values is your agency aiming to protect through its investment in litter management? 1 = not an important value, 10 = significant value

Local amenity	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>
<input type="checkbox"/> 10 <input type="checkbox"/>									
Safety	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>
<input type="checkbox"/> 10 <input type="checkbox"/>									
Local environmental values	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>
<input type="checkbox"/> 10 <input type="checkbox"/>									
Waterways	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>
<input type="checkbox"/> 10 <input type="checkbox"/>									
Port Phillip Bay	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>
<input type="checkbox"/> 10 <input type="checkbox"/>									
Other:	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>
<input type="checkbox"/> 10 <input type="checkbox"/>									

If the values differ across your agency, please describe how they differ.

Who is the audience for your agency considers in the design of its litter management program? If the audiences differs, please describe how they differs and who is the predominant audience is.

Understanding investment in litter

What is the total annual **operational** budget for litter management within your agency (excluding household bin collection, including managing dumped rubbish)?

\$

Please identify the breakdown of litter management expenditure. Use the categories below or specify your own categories if appropriate:

Category	\$/annum	Volume of litter collected
Street litter bins and public recycling		
Street sweeping		
Dumped rubbish		
Disposal costs/tipping fees		
Management of GPTs		
Education/behaviour change programs		
Litter pick-up programs		
Other:		
Other:		
Other:		

What is the total annual **capital** budget for litter management within your agency?

\$

Please outline what the capital investment is planned to deliver:

Understanding where and when you focus litter management

Describe your agency's role in litter education/preventative/behaviour change programs. Are there community or education programs council support/facilitate? What do they aim to achieve? Do you target different community segments differently? Please describe how they differ.

How do you set levels of service of when to collect litter across different land uses? Does the trigger for litter collection vary between different land uses?

For example: 'Parks: we will not visit sites more than weekly because we want to keep at this activity level' vs 'we will not collect litter/not considered as a litter problem until the site get x loads of litter'

Activity centers:

Shopping centers or strips:

Community events:

Sport facilities:

Parks:

Residential streets:

Along waterways:

Other:

Litter management - Asset data collection

Question:	Council data to be provided	Council explanation of data provided:	Best council contact(s) for follow up questions relating to data (
Existing maintenance activities with frequency and volumes collected.			
Street sweeping information	GIS file (or a marked-up map/list) of locations with routes and information on the: <ul style="list-style-type: none"> • frequency of cleaning e.g. maintenance schedule • related litter data e.g. common litter type and volumes collected. PLUS Please use the hotspot survey link https://arcg.is/00TfH8 to mark any litter hotspots that you are aware of from the street sweeping program within the Moonee Ponds catchment.	File name(s): <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ Please explain the data provided to assist our interpretation: _____ _____ _____ _____	Name: Position: Phone number: Email:
Foot path cleaning information	GIS file (or a marked-up map/list) of locations with routes and information on the: <ul style="list-style-type: none"> • frequency of cleaning e.g. maintenance schedule • related litter data e.g. common litter type and volumes collected. 	File name(s): <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____	Name: Position: Phone number:

	<p>PLUS Please use the hotspot survey link https://arcg.is/00TfH8 to mark any litter hotspots that you are aware of from the foot path cleaning program within the Moonee Ponds catchment.</p>	<p>Please explain the data provided to assist our interpretation of the data:</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p>Email:</p>
Street bins	<p>GIS file (or a marked-up map/list) of locations with bin locations and information on the:</p> <ul style="list-style-type: none"> • frequency of cleaning e.g. maintenance schedule • related litter data e.g. common litter type and volumes collected. <p>PLUS Please use the hotspot survey link https://arcg.is/00TfH8 to mark any litter hotspots that you are aware of from the street bin emptying program.</p>		
Other litter cleaning information i.e. where litter needs to be clean up manually in public areas such as parks and sports fields, know regular “litter hotspots” such as common dumping points) or after events.	<p>GIS file (or a marked-up map/list) of locations with locations and information on the:</p> <ul style="list-style-type: none"> • frequency of cleaning (maintenance schedule) • available litter data e.g. common litter type and volumes collected. • cause of the litter <p>PLUS Please use the hotspot survey link https://arcg.is/00TfH8 to mark any litter hotspots that you are aware of from the litter cleaning program within the Moonee Ponds catchment.</p>	<p>File name(s):</p> <p><input type="checkbox"/> _____</p> <p><input type="checkbox"/> _____</p> <p><input type="checkbox"/> _____</p> <p>Please explain the data provided to assist our interpretation of the data:</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p>Name:</p> <p>Position:</p> <p>Phone number:</p> <p>Email:</p>
Gross pollutant trap	<p>GIS file (or a marked-up map/list) of locations with locations and information on the:</p> <ul style="list-style-type: none"> • frequency of cleaning (maintenance schedule) • available litter data e.g. common litter type and volumes collected. • include any observations on the effectiveness of each GPT and the likely origin of litter collected. <p>PLUS Please use the hotspot survey link https://arcg.is/00TfH8 to mark any litter hotspots that you are aware of from the GPT program within the Moonee Ponds catchment.</p>	<p>File name(s):</p> <p><input type="checkbox"/> _____</p> <p><input type="checkbox"/> _____</p> <p><input type="checkbox"/> _____</p> <p>Please explain the data provided to assist our interpretation of the data:</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p>Name:</p> <p>Position:</p> <p>Phone number:</p> <p>Email:</p>

Residential bin emptying	<p>We do not need data from the regular residential/commercial bin emptying, but we do want to know about any litter hotspots that you are aware of from these.</p> <p>Please use the hotspot survey link https://arcg.is/00TfH8 to mark any litter hotspots that you are aware of from the bin collection program within the Moonee Ponds catchment.</p>		

Additional litter hotspot data collection

In addition to the hotspots identified through the analysis of litter collection data above please outline other litter generation or accumulation hotspots across your boundaries. Please include staff observation, litter survey results and or customer compliant data to provide the project team with a complete picture of the litter hotspots with the within the Moonee Ponds catchment. Please use the hotspot survey link <https://arcg.is/00TfH8>

Please list and provide copies of past litter assessment/surveys that will help us understand litter hotspots

File names:

Additional questions

What other groups and agencies are involved in on-ground litter collection in your area? Describe how coordination operates between them in responding to and communicating to community about litter management?

Are there any current litter planning/management projects or issues that your agency is currently aware of and/or working on?

What do you consider to be the main litter issues in your municipality? Is this anecdotal or based on research/data that you have conducted?

What initiatives do you think would make the greatest improvements to litter management for your area?



What initiatives do you think could most successfully be undertaken in coordination across this Moonee Ponds partnership?

In previous litter investigation work within the Moonee Ponds catchment (Hoffmans drain project) the key litter generation was found to be from building site runoff and the mishandling of litter collection from commercial sites. Do you think these issues are likely to be significant within your council area?

Is there any other information you would like to share with us to inform the system wide approach to litter management in Moonee Ponds Catchment?

Please list and provide copies of any research/ strategies/policy/management plans that will help us understand litter management in your agency.

File names:

-
-
-



Moonee Ponds Catchment Litter Project - Community Survey

This survey aims to get a better understanding of the perceptions of litter issues and hotspots within the Moonee Ponds Creek catchment and to inform the collaborative chain of ponds litter project. The project is running in collaboration with City of Hume, Moreland City Council, City of Melbourne, Moonee Valley City Council and Melbourne Water. The project area is shown in the hotspot map below.

Below is a list of questions we would like your feedback on based on your knowledge and experience in the local area.

Please answer all the mandatory fields and pin the local litter hotspots on the map as close to your knowledge as possible.

If there are multiple hotspots that you are aware of, please click '+' at the bottom of this survey to add more points.

Key terms in this survey

Litter: Any discarded, disposed of, or abandoned man-made objects and organic material that is present on land and in water. It consists of articles that have been made or used by people or businesses and subsequently deliberately discarded or accidentally lost. Examples include, but are not limited to, any waste glass, metal, plastic, paper, fabric, wood, trolleys, microplastics, cigarette butts, medical waste, household items, food, soil, sand, concrete or rocks, abandoned vehicles, abandoned vehicle parts, syringes, polystyrene, electronic wastes and garden remnants and clippings. It does not include natural occurring litter such as leaf litter and stormwater debris.

Litter generation hotspot: Location where litter is thought to be generated from. This could be due to: large events, areas where littering is a common practice or areas with frequent use and poor litter management.

Litter Accumulation hotspot: Locations where litter is known to accumulate. This could be known from personal observation, from litter surveys or from area where frequent clean ups are required.

Tell us about you

What is your name?*

Which organisation do you represent?*

E.g. Friends of Moonee Ponds Creek, Kensington Association, Melbourne Water, Moreland City Council

Contact number:

Please fill this in so that we can contact you for any follow up questions if needed.

Email address:

Please fill this in so that we can contact you for any follow up questions if needed.

Where are the litter hotspots in your area?

1

What is the type of litter hotspots?*

Please refer to the 'Key terms' above for the types of litter hotspots.

Litter generation hotspot Litter accumulation hotspot

Both

Where is the litter hotspot?*

Please click on the map to pin the hotspot location as close as you remember. Please note that the project area is highlighted within the blue boundary. You may drag the map around to find the approximate location before clicking at the exact location.

You can provide comments in the box below to further explain the location.

Feel free to use the search bar to help you find the location for a start. To zoom in or out, please click '+' or '-' in the map.

Map data © OpenStreetMap contributors, CC-BY-SA Powered by Esri

No geometry captured yet.

Additional comments

Your comments will help the project team to identify the defining features of the hotspot e.g. a wetland, a drain, Gross Pollutant Trap (GPT), bus stops

What are the main types of litter usually found at this location?*

Please select up to 5 main litter types. We have provided some examples in each litter type below. Please highlight the most concerning litter type in the comment box below and provide additional comments if you wish.

 Glass (beer bottles, jars) Aluminium/metal (cans, containers, beverages) Recyclable plastic (bottles, containers, hard plastics) Non-recycleable plastic (straws, bread ties) Soft plastics (plastic bag, chip/confectionery packets, packaging materials) Paper / cardboard (cups, containers, newspaper, cigarette packs) Cigarette butts Solid waste (vehicle, furniture, timber, paint/oil tins) Electronic waste Building / construction materials (concrete, sand) Hazardous (syringes, needles, asbestos) Food waste (unbagged) Microplastics Polystyrene (food containers)

Other

Additional comments on the litter types

Please inform us of the most concerning litter type

250

Where do you think the litter is generated from?*

E.g. locally dropped, shopping centres nearby, accumulated from nearby drain, unknown

250

How frequently do you consider this location as a litter hotspot?*

Please select one that you think is the closest

-Please Select-

On an average day, how much litter do you usually see?

Please estimate the volume in litres.

Tip: 9 litres = one water bucket; 70-100 litres = one standard wheelbarrow

12³

What do you think makes it a litter hotspot?*

You may select multiple choices.

High volume of litter

High volume of complaints

Safety concerns (i.e. sharps)

Repetitiveness of litter

High public visitation areas

Environmental impact

Other

How important do you think intervention is at this litter hotspot?*



Please comment on your prioritisation in the previous question

255

How are you aware of the litter problem at this location?*

If a litter survey has been completed at this location, please email a copy to:
ying.quek@alluvium.com.au

-Please Select-

If you have any photo of this hotspot, please feel free to upload up to 3 photos.

If you have more than three photos, please email them to ying.quek@alluvium.com.au

Attach a photo

Press here to choose image file. (<10MB)



Attach a second photo

Press here to choose image file. (<10MB)



Attach a third photo

Press here to choose image file. (<10MB)



If you know more hotspots, please click '+' to enter another hotspot.

Submit