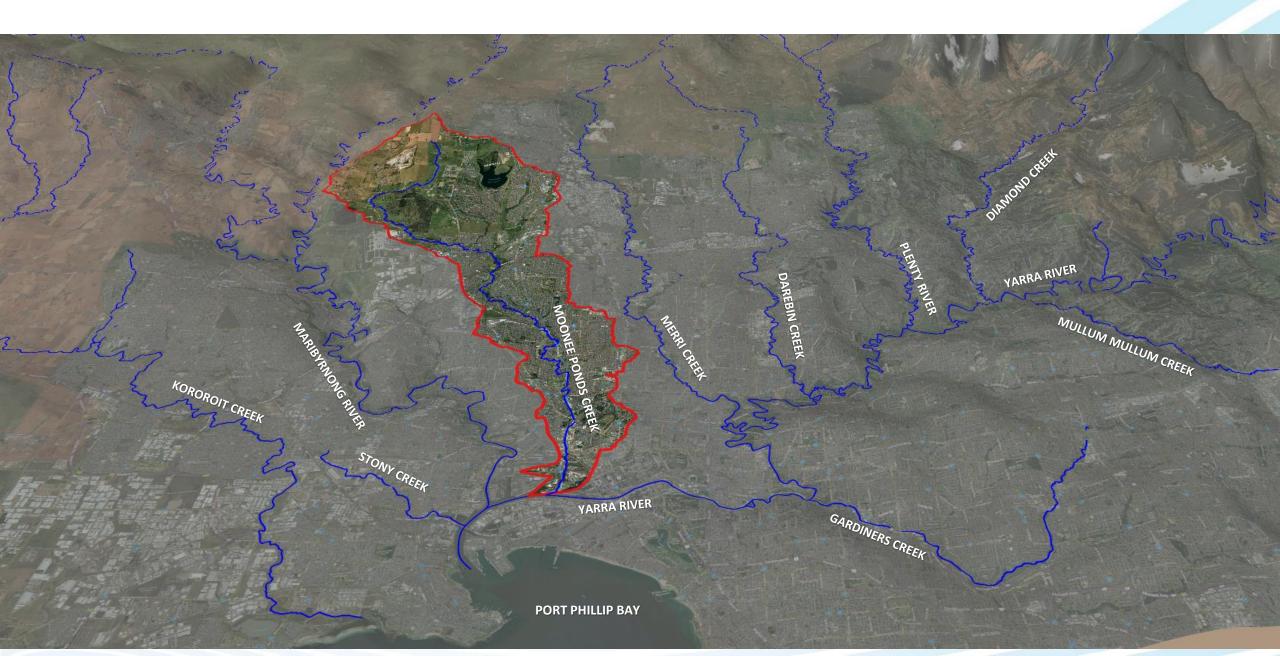
# Flood Storages and Peak Flows in Moonee Ponds Creek: is more storage always better?

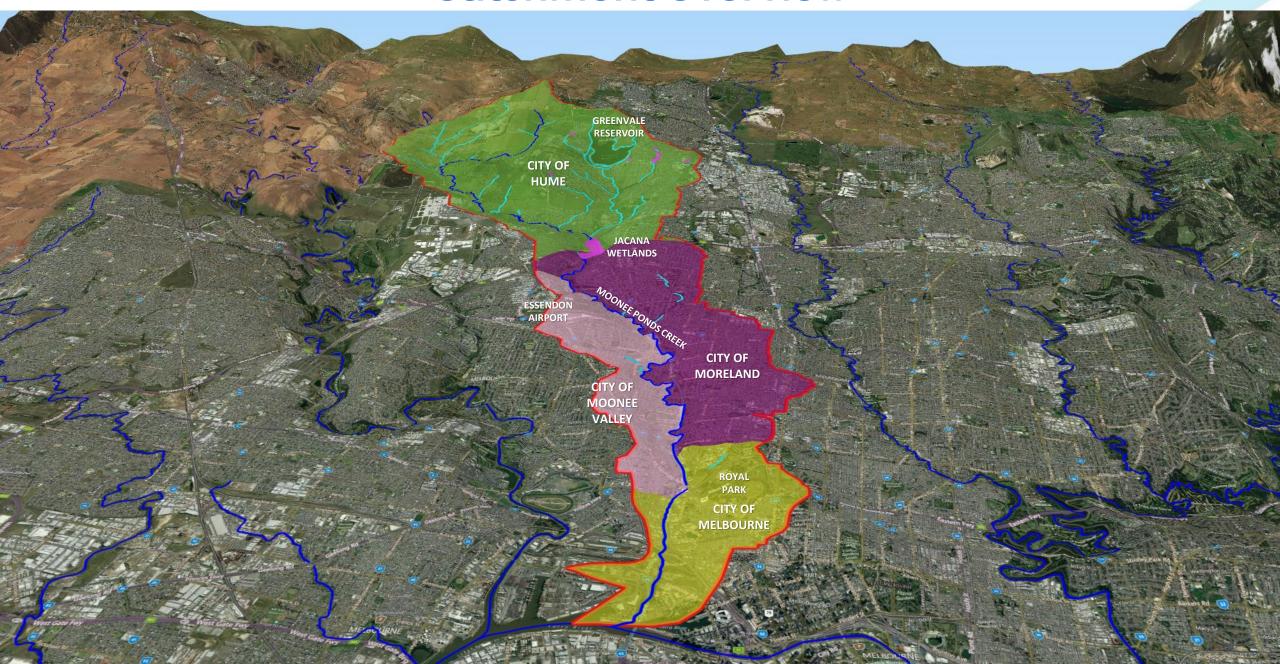
Paul Clemson and Vanessa Wong Engeny Water Management



#### The Moonee Ponds Creek Catchment



## **Catchment Overview**



#### A Timeline of Moonee Ponds Creek



Source: Chain of Ponds – Moonee Ponds Creek Plan (Moonee Valley City Council and Moreland City Council, 2018)



## What does Moonee Ponds Creek Look Like Now?



#### **Current Flood Management Issues**

- Highly impervious catchment
- Hydraulically efficient drainage system
- Lack of flood storage
- Sensitivity of downstream areas to flooding



#### **Project Overview and Objectives**

- Identify the potential for large scale flood storages in the catchment
- Investigate whether providing flood storage in the catchment can reduce flows downstream
- Determine what should be considered in the planning of flood storages



### Methodology

Stage 1: Identification of Potential Flood Storage Sites

Stage 2: Hydrologic Modelling (RORB)



#### Methodology: Stage 1a

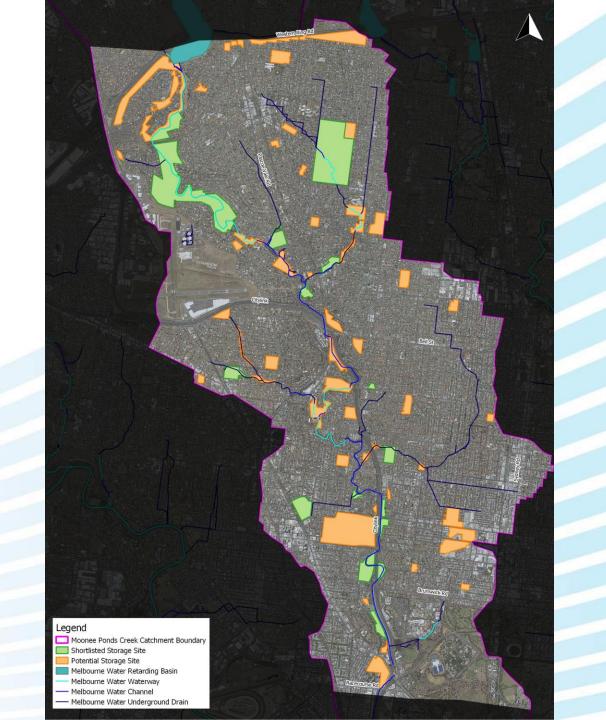
- Preliminary identification of sites
  - Review of drainage strategies
  - Council GIS: parks, open space and council-owned land
  - Aerial imagery
- Total of up to 76 sites covering 407 hectares



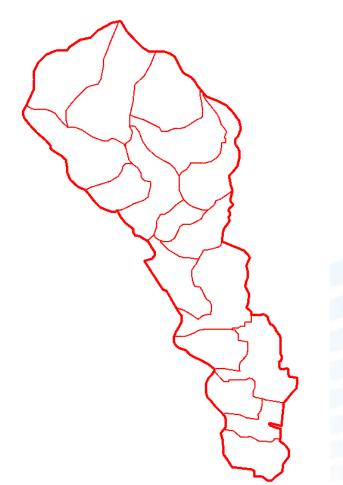
### Methodology: Stage 1b and 1c

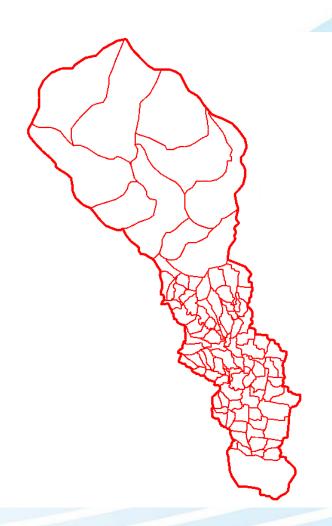
- Stakeholder engagement
  - Known constraints
  - Known opportunities
  - Advice
- Shortlisted sites
  - Council feedback
  - Distribution of sites
- 14 sites shortlisted





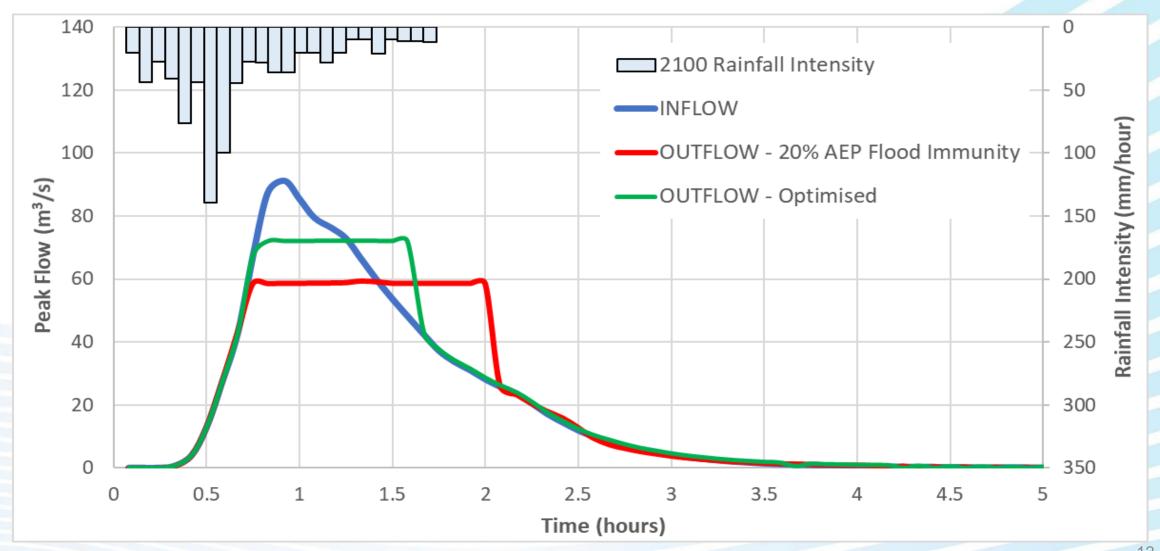
## Methodology: Stage 2a







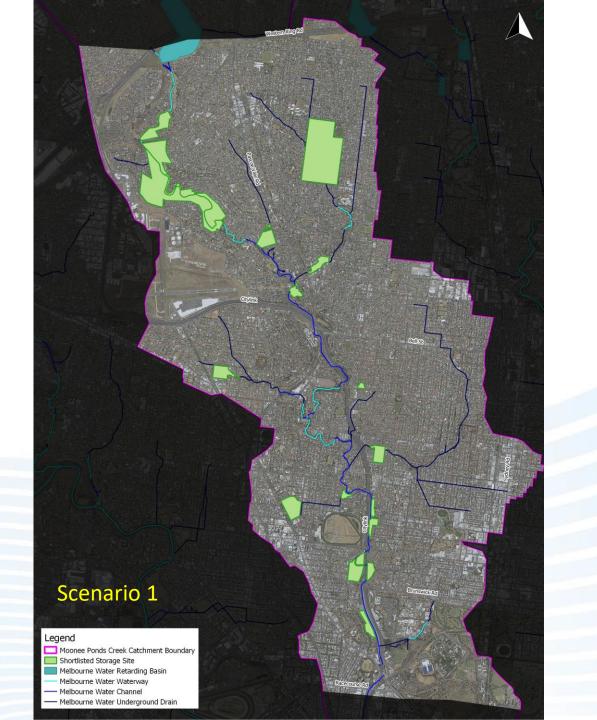
#### Methodology: Stage 2b

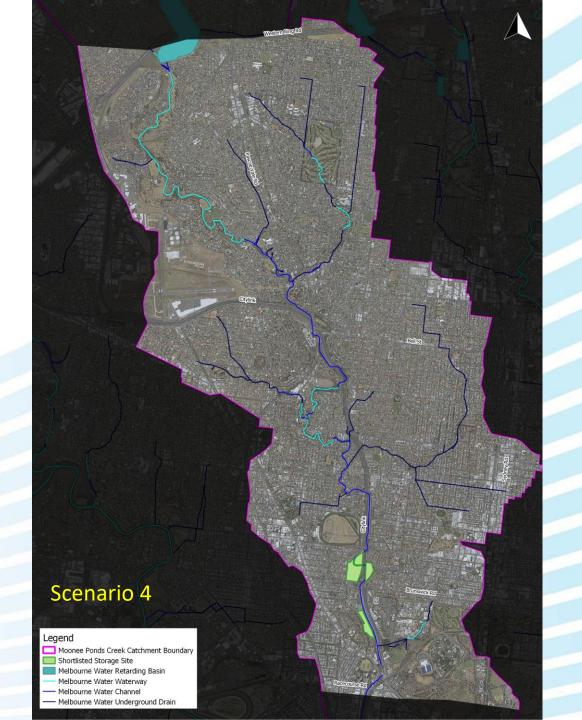


# Methodology: 2c

Scenario	Description		
<b>Existing Conditions</b>	Baseline model with revised subareas – peak flows verified at Mt Alexander Road		
Scenario 1	14 storages		
Scenario 2	12 storages plus 2 large downstream storages		
Scenario 3	9 storages (excludes storages immediately downstream of Jacana Retarding Basin and storages with little proven benefit)		
Scenario 4	2 large downstream storages only		
Scenario 5	10 storages plus 2 large downstream storages (excludes storages immediately downstream of Jacana Retarding Basin)		







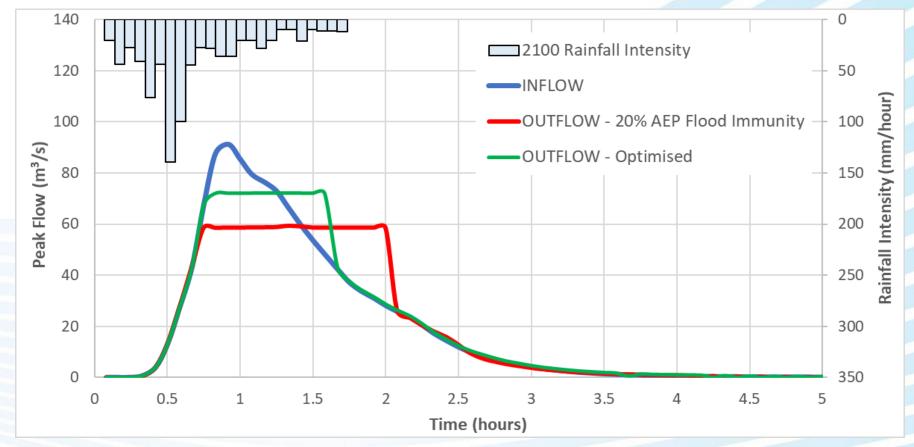
## **Key Project Outcomes**

Scenario	Number of Storages	Approximate Storage Volume	<b>Downstream Benefit</b> (peak flow reduction at Mt Alexander Road)
<b>Existing Conditions</b>	0		
Scenario 1	14	309,000 m <sup>3</sup>	16 % peak flow reduction
Scenario 2	14	389,000 m <sup>3</sup>	20 % peak flow reduction
Scenario 3	9	206,000 m <sup>3</sup>	13 % peak flow reduction
Scenario 4	2	160,640 m <sup>3</sup>	19 % peak flow reduction
Scenario 5	12	302,000 m <sup>3</sup>	18 % peak flow reduction



#### **Key Project Outcomes**

 Depending on your objective, adding flood storage is not necessarily good





#### **Key Project Conclusions**

- Reducing flows to provide effective downstream flood mitigation is difficult
- Offline vs online storages
- Reducing the peak flow is not necessarily good if flows remain high for longer
- Local catchment studies vs overall catchment studies
- Flood storage strategy integration with other catchment stormwater strategies



#### **Thank You**

- City of Melbourne
- Melbourne Water

- Moonee Valley City Council
- Moreland City Council









