Melbourne Water

clearwater supporting you in sustainable urban water management

Hot Topics Series 2009

WSUD in urban development: Policy and Planning

Friday 25 September 2009

MC: Jamie Ewert - Melbourne Water

Overview of day

Welcome

Intro Clearwater and Melbourne Water
Jamie Comley (Melbourne Water): WSUD Policy & Planning Overview
Paul Mitchell (Whittlesea Council): Implementing Clause 56
Stephen Bock (Western Water): Planning for sustainable water mgmt

Morning Tea

Intro to cluster discussion groups
Concurrent cluster session 1: Four topics to choose from
Concurrent cluster session 2: Repeat of above

Stretch Break

Cluster report back
Comments / questions and learning's

Lunch

Melbourne Water

clearwater supporting you in sustainable urban water management

Emily Kaye

Clearwater Manager

emily.kaye@clearwater.asn.au

9235 2506

Who is Clearwater?

clearwater
supporting you in sustainable urban water management

- Non profit capacity building program
- We aim to increase the uptake of sustainable water management
- Broad target audience
- Training, events and tours
- Advice and informative website
- We deliver events that you ask for
- Enjoy today, meet people, ask questions and tell your stories
- Evaluation tells us what you want to know more about

Leon Harvey

Program Leader

Living Rivers Stormwater Quality Team

leon.harvey@melbournewater.com.au

9235 1578

Clause 56.07 of the Victoria Planning Provisions

Jamie Comley

Program Leader Regional Stormwater Projects.

MelbourneWater Victoria The Place To Be

Planning, Policy and WSUD: What, Why and How?

Hot Topics - 25 September 2009

Jamie Comley, Melbourne Water

Victoria
The Place To Be

Melbourne Water

Or rather…'Why, What and How?'

Overview

1. Why: A quick refresher on catchment management
   - the impact of urbanisation!
2. What: The existing responsibilities, policies and systems
3. How: Processes, practices and tips for implementing WSUD

WHY plan for WSUD?

1. Catchment Health
2. …and the rest!

WHY plan for WSUD? (a crash course in healthy catchments!)

Impacts of urbanisation

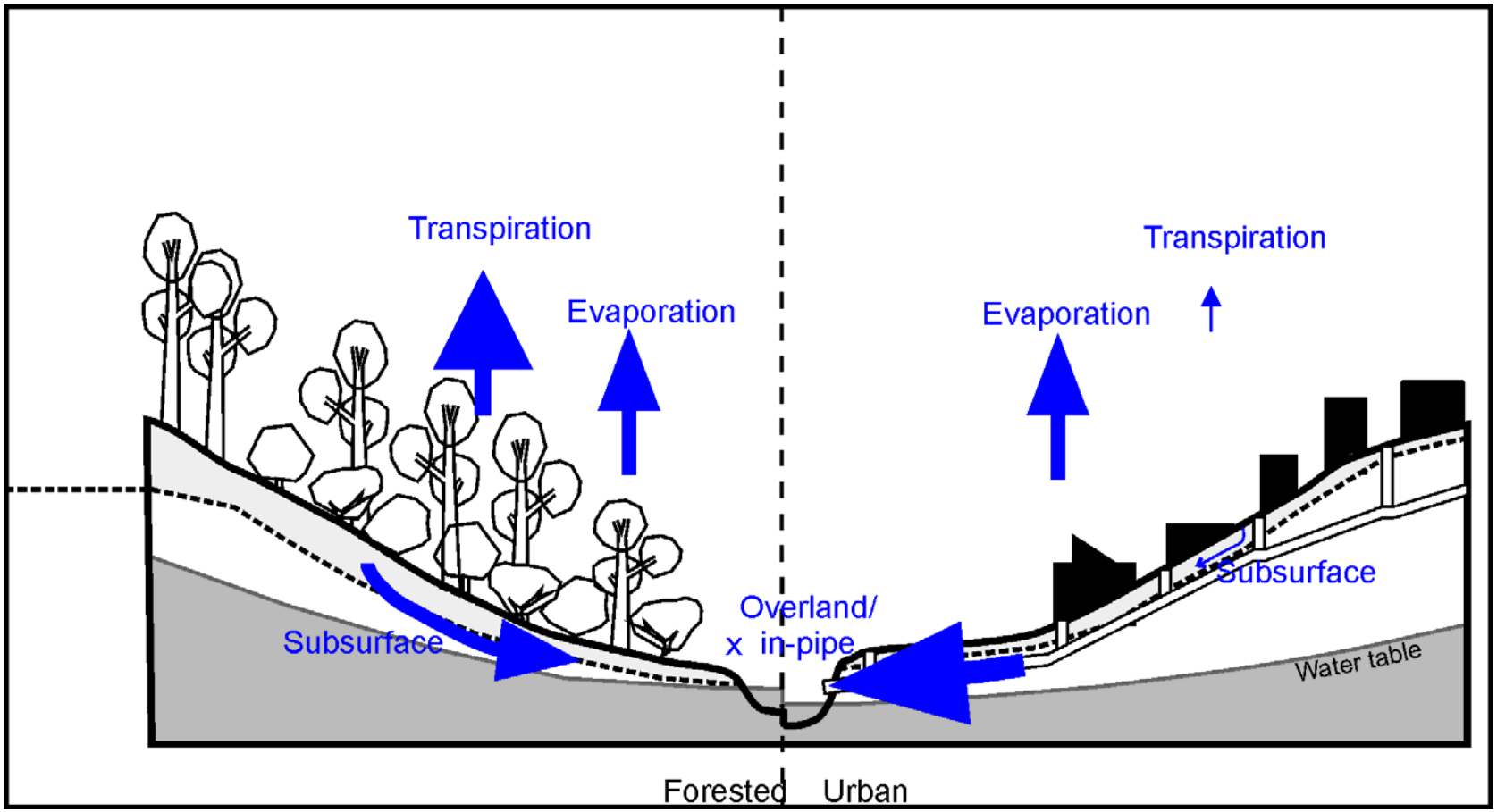
Hard, impervious surfaces means:

- More runoff
- More quickly ('efficient' drainage systems)
- More polluted (due to urban land uses)

This causes:

- Altered flow regime affecting habitat suitability
- Erosion impacts
- Sediment
- Poor water quality

Catchment Impacts - Natural vs Urbanised



WHY plan for WSUD? (a crash course in healthy catchments!)

Planning considerations

Stormwater Quality - needs 'filtering':

- sediment, heavy metals, nutrients, hydrocarbons, etc.

Runoff Frequency

- Natural system
  - more than ~15mm rain event runs off (infiltration/evapotranspiration)
  - = 5-15 runoff days per year
- Urban system
  - more than 1mm rain event runs off
  - = ~120 runoff days per year

Runoff Volume

- = ~ 10 times natural runoff volumes

WHY plan for WSUD? (a crash course in healthy catchments!)

We need to return to a **more natural water cycle!**

Directly Connected Imperviousness (DCI)

- = Impervious areas connected to receiving waterways by pipes or channels
- Melbourne Uni study (Chris Walsh):
  - Measured 'bugs' (macroinvertebrates) to determine stream health
  - Above 2% DCI, stream health declines dramatically
  - Above 10% DCI, most streams are:

For healthy urban streams we need to aim at <1-2% DCI

- ➢ Need to 'lose' stormwater to infiltration and evapotranspiration – use it!

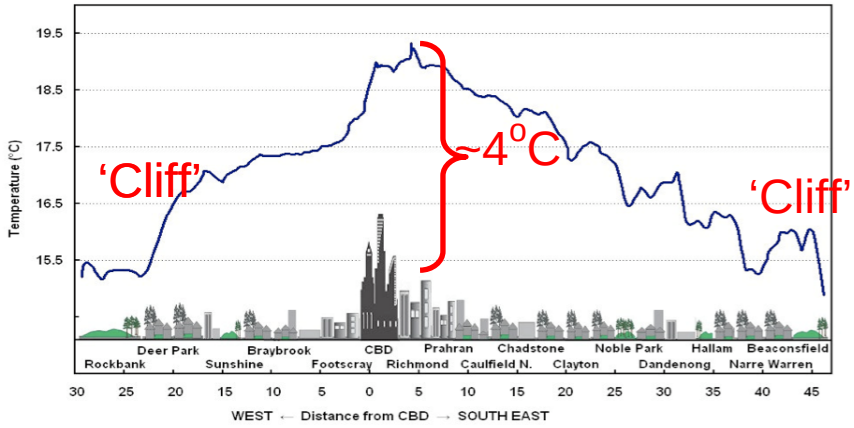
WHY ELSE plan for WSUD? (a crash course in sustainability!)

The obvious…

- Maintain the values of waterways & bays
- Valuable water resource – enhance water security
- Passive irrigation of landscaping (saves water and $)

The more surprising…

- Reduce flooding
- Reduce drainage infrastructure costs
- Reduce urban heat-island effect



WHAT?

WHAT are the WSUD planning & policy requirements?

1. Responsibilities
2. Existing Policies (and gaps)
3. Supporting Systems

WHAT are the WSUD planning and policy requirements?

Responsibilities

- Local Government is the Drainage Authority for catchments <60ha
- Melbourne Water is the Drainage Authority for catchments >60ha, and also the manager of Melbourne's waterways
- As we've seen, we can't achieve healthy waterways unless we deliver healthy catchments!
  - ➢ This responsibility is shared between councils and MW

WHAT are the WSUD planning and policy requirements?

Existing Planning Policies

Clause 56.07-2

- Mandates dual-pipe systems in new residential subdivisions where specified by the retail water authorities

WHAT are the WSUD planning and policy requirements?

Existing Planning Policies

Clause 56.07-4

- Requires new residential subdivision to meet best practice stormwater management targets:
  - 80% reduction in Total Suspended Solids (TSS)
  - 45% reduction in Total Phosphorus (TP)
  - 45% reduction in Total Nitrogen (TN)
  - 70% reduction in Gross Pollutants (litter)
  - Maintain 1.5-year ARI flow discharges at pre-development levels

WHAT are the WSUD planning and policy requirements?

Existing Planning Policies

Clause 56.07-4 – gaps/issues

- *Does not apply to subdivision of existing buildings – infill*
- *Does not apply to commercial/industrial*
- *Does not adequately address DCI issue*

WHAT are the WSUD planning and policy requirements?

Existing Planning Policies

State Planning Policy Framework

- Clauses 12.05 and 12.07 (Metropolitan Development)
- Clause 15 (Environment)
- Clause 18.09 (Water Supply, Sewerage and Drainage)

Local Planning Policies

- Bayside Planning Scheme Clause 22.10 (C44 Amendment)
  - Applies to *development* in res/ind/comm and Business Zone subdivision
- IMAP Councils

WHAT are the WSUD planning and policy requirements?

Supporting Systems

Melbourne Water Stormwater Quality Offsets Scheme

- Where a development is required to meet Best Practice on site but this is proven unfeasible, the developer may pay to have his unachieved stormwater treatment requirement met by MW

Melbourne Water Development Services Schemes (DSS)

- MW plans the hydraulic – and sometimes the stormwater quality treatment – requirements for an entire drainage catchment area. Developments occurring in DSS areas with built-in stormwater quality treatment may opt to pay towards the scheme rather than meeting Best Practice standards on site.

HOW?

How can WSUD be achieved through the planning process?

1. Addressing existing policy gaps
2. Achieving better WSUD planning outcomes
3. Assistance available

HOW can WSUD be achieved through the planning process?

Addressing existing policy gaps

- Develop Local Planning Policies to strengthen policy backing
- Use other planning policies to support your decisions
  - SPPF Clauses 12.05, 12.07, 15, 18.09
  - Drainage plan requirements (development applications)
- Provide feedback on policy issues to DPCD, MAV, PIA etc. (get active to initiate change!)

HOW can WSUD be achieved through the planning process?

Achieving better WSUD planning outcomes

- Too intent a focus on the specific Best Practice requirements often results in missing opportunities for better value
  - Go beyond the existing policies – look at using stormwater on-site to meet Clause 56.07 and deliver greener developments (and healthier waterways, water savings, cooler suburbs…)
- Talk across council departments (e.g. Planning, Eng)
  - Formalising a strategic commitment often helps!
- Communicate with applicants on WSUD inclusion as early as possible
- Inform and negotiate with applicants on WSUD options for better, mutually beneficial outcomes
- Get creative!

HOW can WSUD be achieved through the planning process?

Assistance available

- Melbourne Water offers:
  - A range of free resources (fact sheets, guidelines, etc)
    - See www.wsud.melbournewater.com.au
  - Assistance from their Stormwater Policy Officer on matters of policy and process
  - Capacity building for council staff in WSUD skills through the Living Rivers Program
  - Contacts and networking opportunities with staff at other councils
  - The potential to undertake strategic projects and communications tools to assist councils
- Clearwater offers a range of training courses and events to build industry members' capacity in WSUD

Wrapping up…

Take home messages

- Planning policies aim to protect our waterways from the damaging effects of urbanisation
  - Flow quality, frequency and duration all need to be managed
    - Reducing DCI is an ideal approach
- Most existing policies don't serve this need particularly well

BUT…

- Through good communication early in the process, and using the support of the full suite of existing policies, councils are able to negotiate solutions beyond the minimum requirements…
  - …and these tend to provide increased benefits to the developer, council and the environment!


Thank you! Questions?

City of Whittlesea
Policy and Planning
for
WSUD in Urban Development

Clearwater Hot Topics
25 September 2009
Paul Mitchell - Development Engineer
Whittlesea City Council – Victoria – Australia

INTRODUCTION

- Local Government Area Totaling 49,000 Ha.

  Residential Growth Area - 4278 Ha of New Development

- Population Growth:-

  132,000 (2006) --- 178,000 (2016) --- 240,00 (2030)

- City Infrastructure Currently Includes:-

  855 km Roads (88.5% Sealed)

  600 Parks - Totaling 760 Hectares

  1043 km Underground Drains & 1117 km Footpaths

  104 GPT's, 56 Raingardens & 35 streets with Swales

HISTORY

- WSUD first approved – Aurora Estate - 2003
- WSUD first constructed – Aurora Estate - 2004
- Many estates continued to rely on ‘end of pipe’ wetlands
- Only 2 or 3 developers asked for WSUD in streets
- Not all contractors competent in swale and rain garden construction methods

STORMWATER MANAGEMENT PLAN

- City of Whittlesea Adopted Policy Document
- Embodies Sustainability Principles for Water Capture, Cleansing and Re-use
- Subject to Review Every 2 Years
- 2007 Review Added Actions in Support of WSUD

City of **Whittlesea**

POLICY FRAMEWORK

ENGINEERS AUSTRALIA

Australian Runoff Quality

A guide to Water Sensitive Urban Design

Department of Sustainability and Environment

Sustainable Neighbourhoods

Commentary

Clause 56 – Residential Subdivision

September 2005

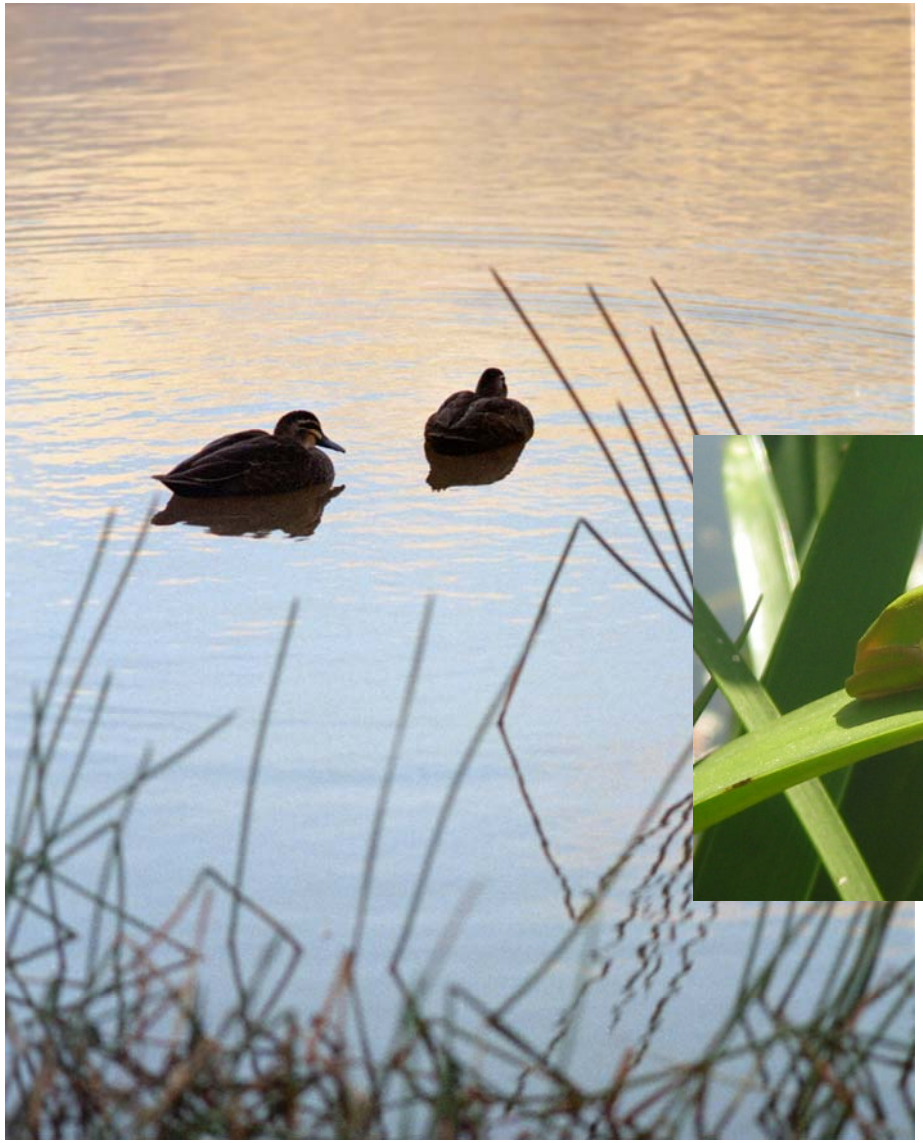
Victoria The Place To Be

MANAGING MULTIPLE OBJECTIVES

- Natural ecology
- Traffic
- Housing Density
- Social infrastructure
- Passive Open Space
- Infrastructure Maintenance

City of Whittlesea

WETLANDS AND PASSIVE OPEN SPACE



City of Whittlesea

LANDSCAPING

MAINTENANCE COSTS

OBJECTIVES:

- Protection of ecosystems downstream
- Flood protection at the local scale
- The aesthetics of WSUD elements

IMPLICATIONS:

- Shift in management objectives
- Shift in responsibility associated with water quality away from the Regional Authority to Local Government
- Skilling of local workforce leads to acceptance

WSUD Design and Approval Guidelines

- The City of Whittlesea supports Water Sensitive Urban Design

  - in terms of achieving outfall quality targets for storm water, and

  - quantity targets, in accordance with Melbourne Water design outcomes.

- The context for provision of WSUD systems is to be first discussed and agreed with Council.
- Targets for percentages of quality improvement to be obtained from distributed systems (e.g. rain gardens or swale drains) as compared with end-of-pipe wetlands may be set by:
  - Local Structure Plan, or
  - Melbourne Water Drainage Scheme (through the design process outlined below).
- Public Open Space area(s) to be set aside to provide a fail-safe option, in the long term in case the distributed systems need to revert to an end-of-pipe solution.

WSUD Design and Approval Guidelines

Once the context has been discussed and agreed, methods of achieving quality targets are determined according to:-

- Element Type
- Planning & Urban Design Criteria
- Technical Approval Criteria

WSUD Design and Approval Guidelines

A design process should be adopted which considers the following matters:

- Consultant to work with Council to identify the design constraints of the area [e.g. heritage considerations, road linkage directions, preservation of active open space, utilization of power line easements, streetscape effects along major arterials and beside reserves, flat land to be preserved for reserves and not used by WSUD, land which should be used for end treatment for WSUD where necessary, extent of flood protection, linking to adjacent development, opportunities from a landscape point of view etc.];
- Consultant to identify opportunities for distributed WSUD around the above design constraints using a mix of swale drains, rain gardens etc to achieve variety of streetscape;
- Consultant to identify deficiencies in meeting full quality objectives of the proposed distributed treatment;
- Consultant to identify the end of pipe additional treatment required (outfall lake or pond) and location of treatment, together with identifying landscaping opportunities;
- Consultant to incorporate effects of utilizing rainwater tanks on residential property (whether mandatory or optional);
- Proposal returned for further review by Council and Melbourne Water, showing all relevant design constraints and the solution being offered;
- Consider maintenance issues and/or proposals to be met by Council (incl. life cycle costs);
- Acceptable solution to incorporate all the above;
- Council will require agreement with the consultant on the method of proposal review.

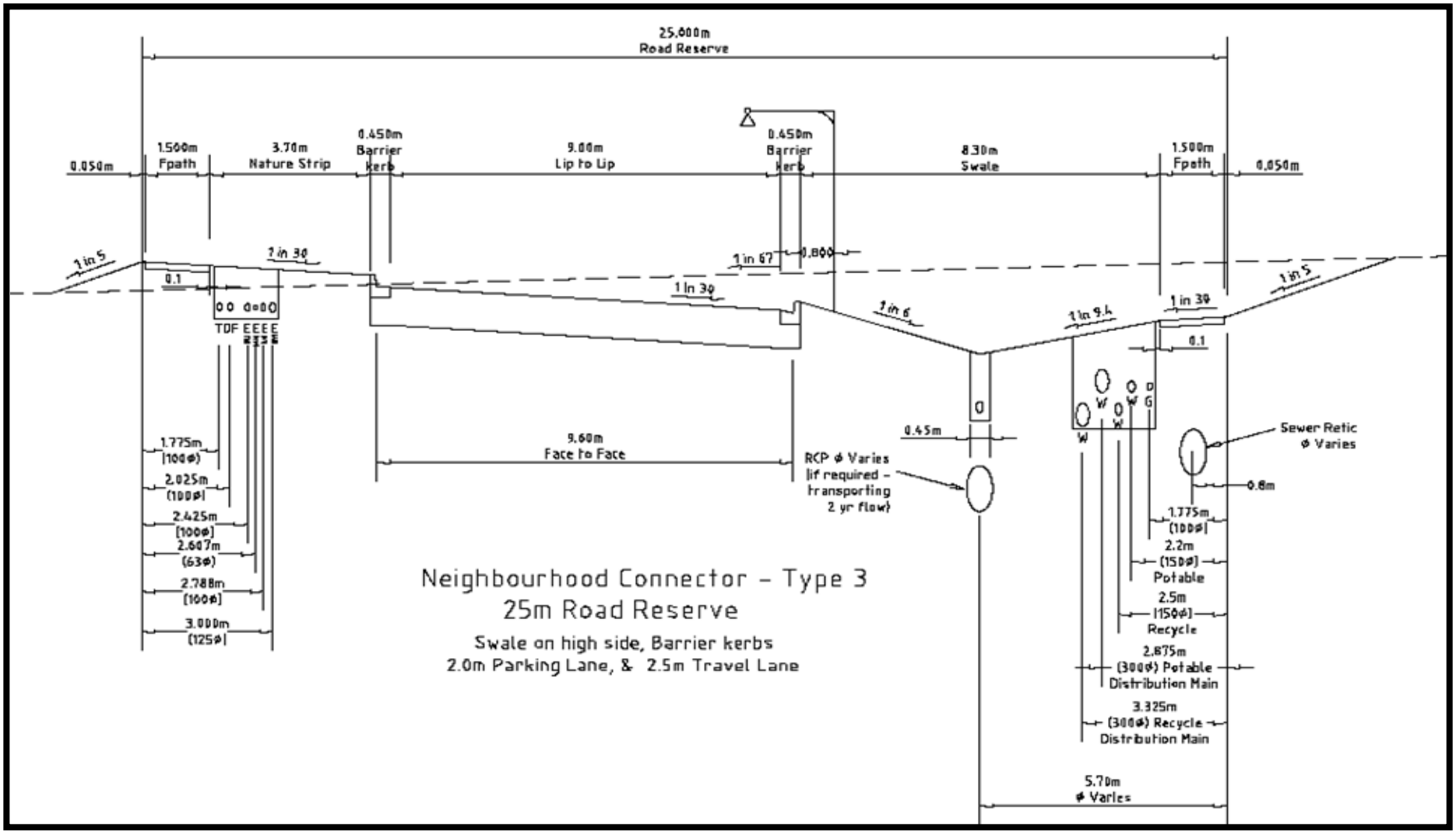
WATER SENSITIVE URBAN DESIGN ELEMENTS

- Rainwater Tanks
- Vegetated Swales
- Bioretention Swales
- Rain Gardens
- Gross Pollutant Traps
- Aquifer Storage and Recovery
- Constructed Wetlands
- Lakes and Ponds

City of Whittlesea

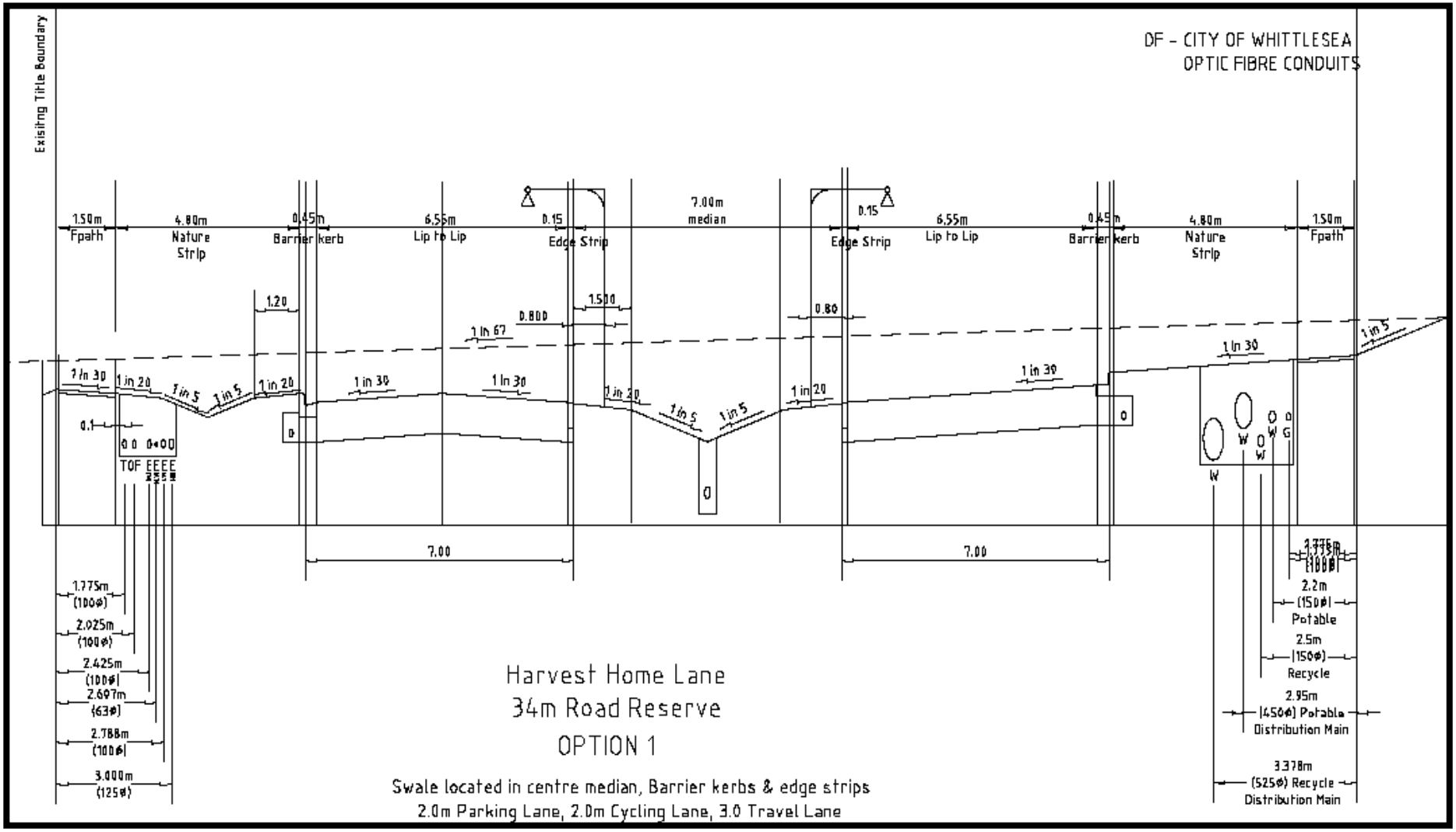
Rainwater Tanks

SWALES IN WIDE NATURESTRIPS



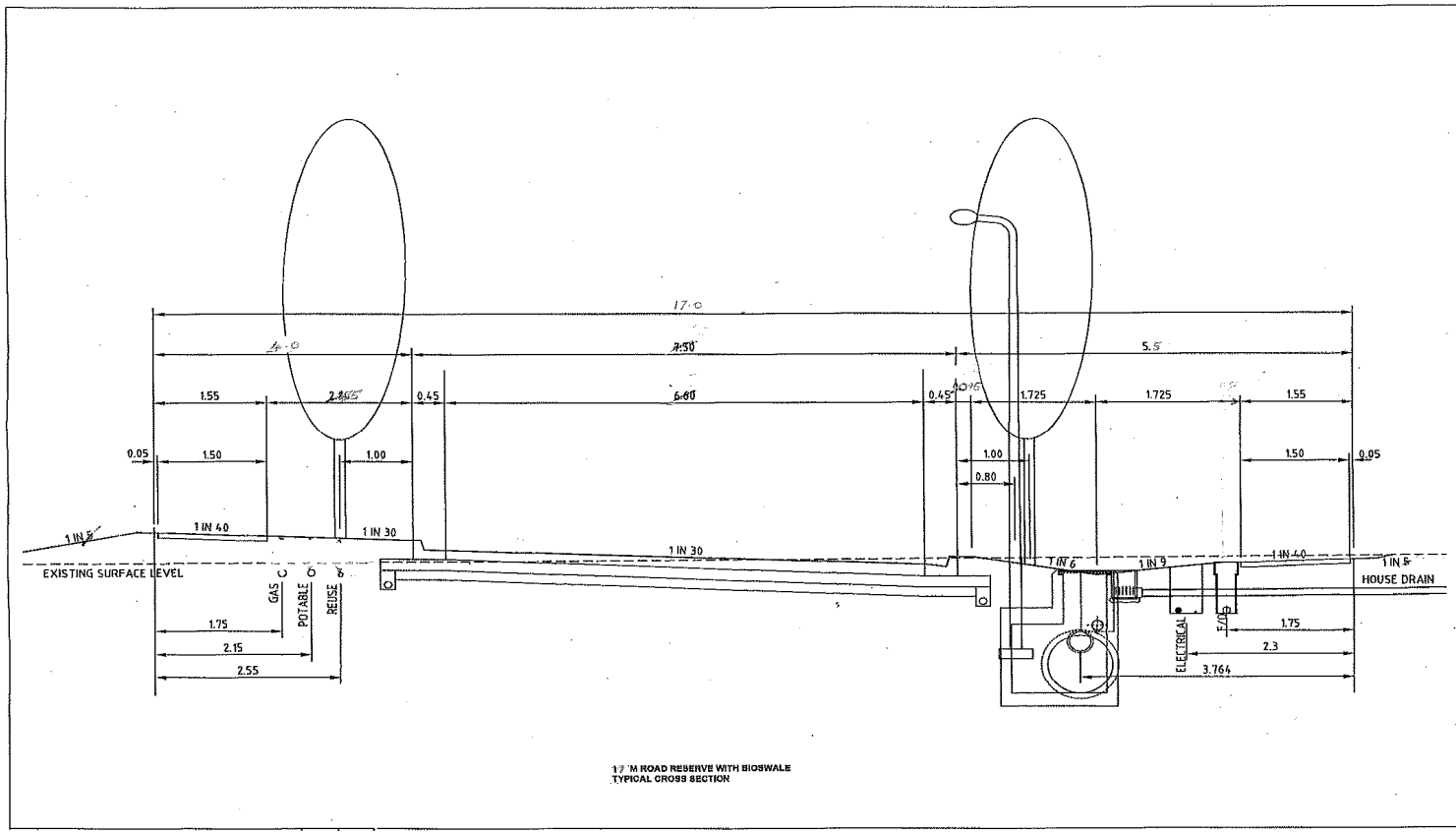
Vegetated Swales – Outer urban

SWALES IN CENTRE MEDIANS



Bioretention Swales – Inner Urban

MINIMUM SPACE FOR SWALES



17 M ROAD RESERVE WITH BIOSWALE
TYPICAL CROSS SECTION

City of Whittlesea

Rain Gardens

Gross Pollutant Traps

Aquifer Storage and Recovery

- Requires Suitable Geological Conditions
- Injected Water free of pollutants
- Storage Plume Must be Confined
- Reclaimed Water to be fit for purpose

City of Whittlesea

Constructed Wetlands

City of Whittlesea

Lakes and Ponds

City of Whittlesea

THANK YOU

www.whittlesea.vic.gov.au

Toolern Integrated Water Management Project

(Clearwater)

25 Sept 2009

Stephen Bock

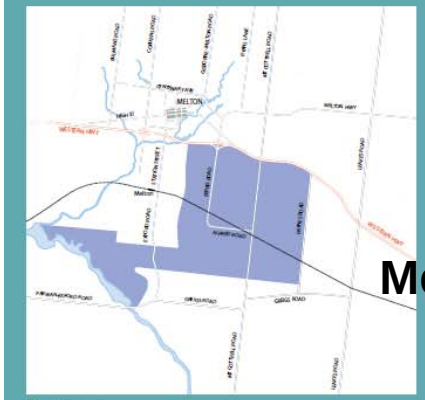
Toolern Precinct

Toolern

Harness Racing Victoria – Tabcorp Park

Western Hwy

Greater Melbourne



Melton Township

The key uses are:
- General Employment
- Mixed use: Employment
- Feature Employment
- Civic uses
- Retail / activity centre
- Mixed use: Residential
- Medium density residential
- Conventional density residential
- Public open space

Harness Racing Victoria

Melbourne-Ballarat Railway Line

Ferris Road

Paynes Road

Melton Reservoir

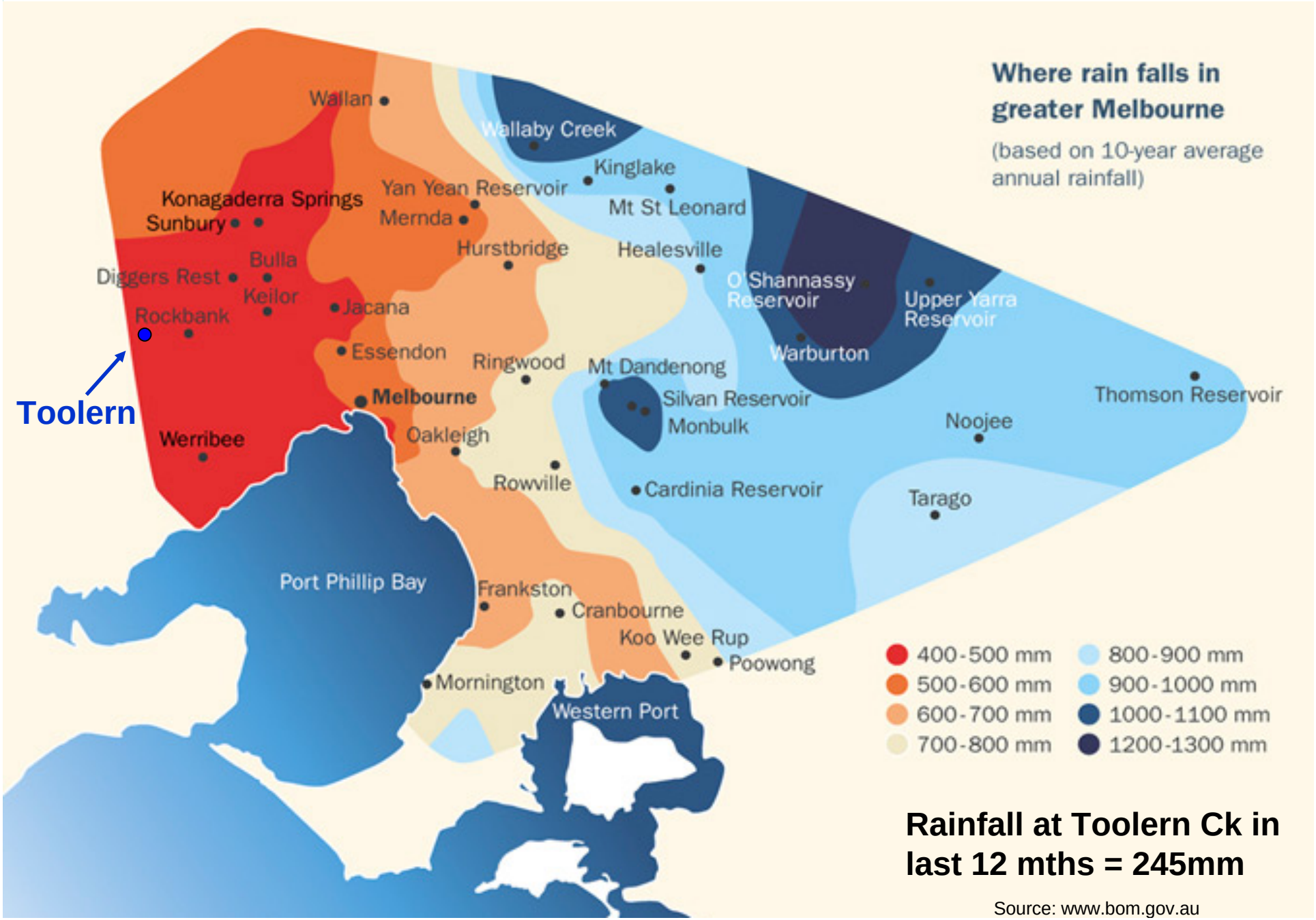
Surbiton Park RWP

Rail Line

Toolern Data

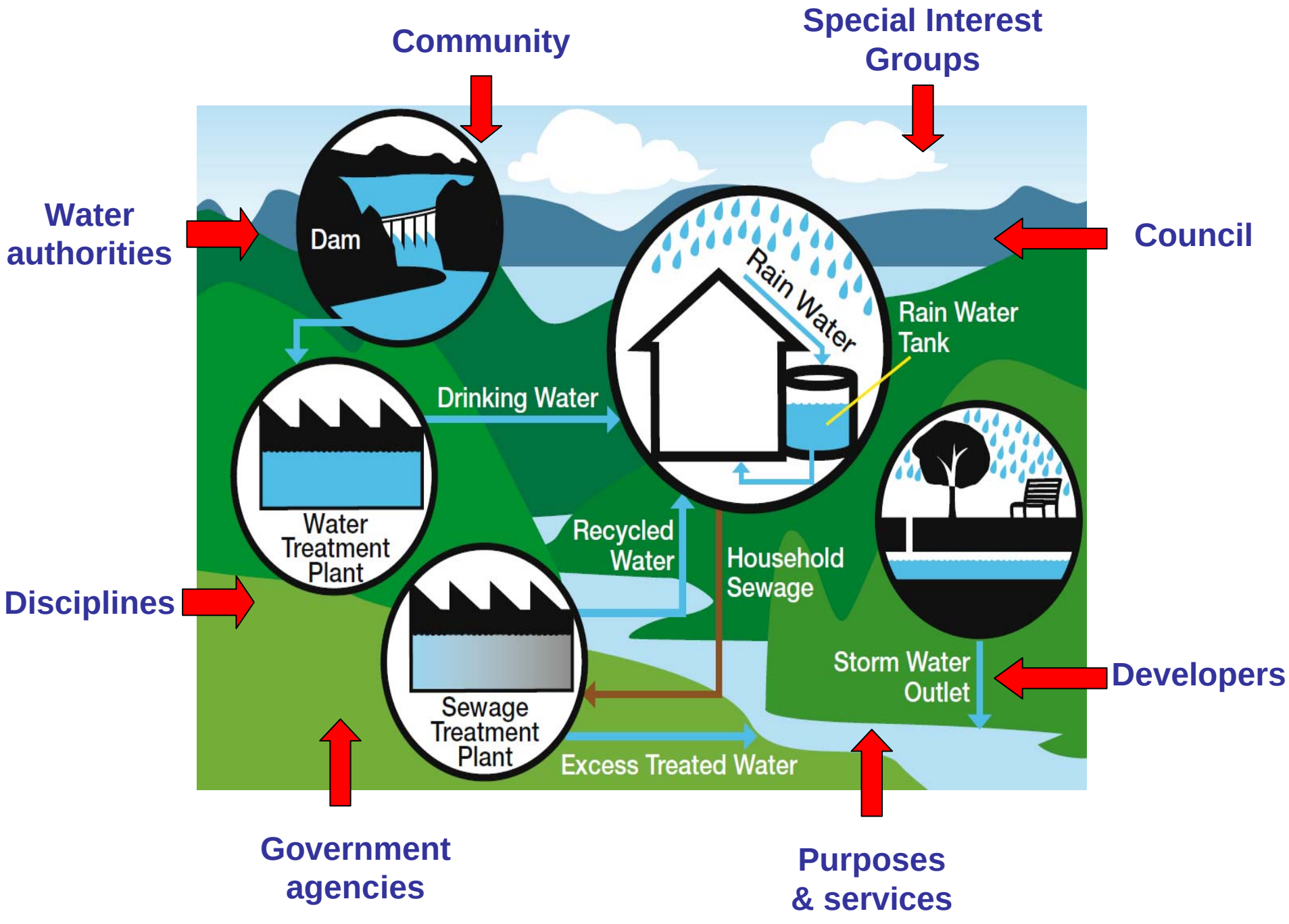
- **Expected Population** **60,000**
- **Toolern Precinct Area** **2316 Hectares**
- **Residential** **1811 Hectares**
- **Public Open Space** **212 Hectares**

The Rainfall Shadow



Rainfall at Toolern Ck in last 12 mths = 245mm

Source: www.bom.gov.au


Community
Special Interest Groups
Water authorities
Council
Disciplines
Developers
Government agencies
Purposes & services
Dam
Rain Water
Rain Water Tank
Drinking Water
Water Treatment Plant
Recycled Water
Household Sewage
Storm Water Outlet
Sewage Treatment Plant
Excess Treated Water

Project Stakeholders

- Western Water
- Melbourne Water
- Melton Shire Council
- Southern Rural Water
- Sustainability Victoria
- Parks Victoria
- GAA
- EPA

- Developers
  - Taylors
  - Watsons
  - MAC
- Environmental Groups
  - Pinkerton Landcare Gp
  - Friends of Toolern Ck
- Community Groups
- Major Landowners
  - Harness Racing Victoria
  - Industrial
  - Melton Shire Council

Project Methodology

Defining what the Project looks like	Charter the Project	Multi – Generation	**Gate Review**
	Produce Project Plan	Team & Stakeholders	
Measure and gather Voice of Customer & Business etc	VOC & VOB	Other Measurements	**Gate Review**
	Gather Best Practice	Customer Segmentation	
Explore the options. Multi Criteria Analysis	Design Concepts	Updated Charter	**Gate Review**
	Best Fit Selection	Confirm fit with VOC, VOB	
Develop the preferred solution(s)	Detailed Design	Process Control Plan	**Gate Review**
	Pilot Plans & Replication		
Implement	Handover to Developers, Council & Other Process Owners. Western Water remains an active partner. Have the targets been met? Can they be sustained?		**Gate Review**

Toolern, WSUD & IUWM
Going beyond Clause 56

Clause 56 requires the removal of

- 80% Total Suspended Solids
- 45% Total Phosphorus
- 45% Total Nitrogen
- 70% Gross Pollutants

Toolern

- Achieve and surpass all Clause 56 targets through conventional WSUD treatments and innovative solutions
  - Collaborate with academia & developers to encourage innovation
  - Set targets for Directly Connected Imperviousness
  - Stormwater harvest & re-use to reduce potable consumption by at least 50%
  - Identified and outlined in the Toolern Precinct Structure Plan

Elements of Success

- Collaboration
- Stakeholder Input
- Positive Attitudes
- Questioning existing practices
- Innovation is possible


WESTERN
WATER

Topic Cluster Groups

Cluster 1:

- Working with developers
- Planning for asset hand over

Cluster 2:

- Melbourne Water Wetland Guidelines – updated guidelines
- Music Version 4

Cluster 3:

- Stormwater offsets -Form A

Cluster 4:

- Bayside Amendment – C44

THANK YOU

Contact Clearwater

info@clearwater.asn.au

www.clearwater.asn.au

9235 5335