

## On-site Wastewater Management Training Course

### Land Capability Assessment; Desktop Study

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## Land Capability Assessment

- The State Environment Protection Policy (Waters) sets out requirements for managing domestic wastewater
- Clause 28 requires Councils to ensure that domestic wastewater can be 'treated and retained within allotment boundaries' and 'do not pose a risk to beneficial uses'
- Clause 29 requires Councils to develop a DWMP

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## Land Capability Assessment

- Residential developments that generate wastewater may require a Land Capability Assessment (LCA) to be undertaken at some time before the development proceeds, for submission to the local council
- The LCA should demonstrate that wastewater can be treated and retained within allotment boundaries
- May be done at subdivision (required) or single lot development stage

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## General Environmental Duty

- Businesses are responsible for protecting the environment and human health
- Commenced on 1 July 2021 under the amended Environment Protection Act 2017
- Intended to reduce the risk of harm from activities:
  - to human health and the environment
  - from pollution or waste
- See slides following in Section 13.1

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## Definition

- Environmental Protection regulation (EPR) 47/2021 defines LCA as:

“an assessment of the risks of harm to human health and the environment of the proposed or existing on-site wastewater management system at the site, taking into account the proposed or existing use of the system”

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## Reference Material

- The Code of Practice (CoP) – Onsite Wastewater Management, Publication 891.4 (EPA, 2016) refers to the requirement for LCA, and refers to:-
- Model LCA Report (MAV & DSE, 2006 as amended, i.e. Victorian Land Capability Assessment Framework (MAV, DEPI & EPA 2014))

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## Guidance

- The Municipal Association of Victoria, (MAV) through its involvement with the Country Towns Water and Sewerage Program, identified a need within local government and consultants for an increased understanding of LCA
- The 2006 Model Land Capability Assessment was prepared to address this need and was updated (Jan 2014) to align with the new Code

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## Land Capability Assessment

- So why did this concern arise?
- Local government officers expressed concern over the adequacy of LCAs being submitted for unsewered development, and
- The large number of cases appearing before the Victorian Civil & Administrative Tribunal (VCAT) which relate to approval of developments involving on-site wastewater

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## Land Capability Assessment

Generally, the purpose of a LCA is to:

- Assess the capability of a Site to sustainably manage wastewater within allotment boundaries; and
- Determine risk, gather relevant information to inform the design process and formulate a sustainable management plan

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## When is LCA required?

- Recommended for all unsewered development
- May not be required by Council if site is considered low risk or if adequate information is already available
- Must be undertaken for all unsewered properties in Special Water Supply Catchments

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## Who should undertake LCA?

- Suitably skilled and qualified person with appropriate technical expertise and experience in site and soil assessment and on-site wastewater design
- Councils may require written verification of qualifications, experience, professional membership and professional indemnity insurance

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## Consultation and Review

- Council officers assessing LCAs should be similarly qualified and experienced to competently and confidently interpret and evaluate LCA reports and specify development conditions
- Developers and LCA Assessors should consult with Council before and during the preparation of a LCA

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## Undertaking a LCA

- May be a for single-lot or subdivision
- Focus here is on single-lot LCAs
- Reporting based on EPA Code of Practice 891.4 and Australian Standard AS/NZS1547:2012
- Level of detail depends on site and surroundings
- LCA assigns a level of constraint to each site and soil characteristic

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## 'Site' characteristics

- Climate
- Flood potential
- Exposure
- Slope (%)
- Landform
- Run-on and seepage
- Erosion potential
- Drainage (indicative)
- Fill
- (Available) Land Area
- Geology and rock outcrops
- Vegetation

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## Scope and Consultation

- Identify the Site
- Consider the land-owner's preferences
- Liaise with Council
- Determine the level of LCA required
- Consult with agencies and authorities (e.g. Water Authority) as required

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## Important Advice

- Consultation is the Key: early consultation between Council and the Land Capability Assessor is vital in determining just what is expected in the LCA, what special issues might apply in the area, or what additional information can be obtained from Council

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## Stages of Data Collection

- Desktop Study (focus of this session)
- Site and soil check
- Soil description and profile assessment
- Calculations
- Collection of additional data
- Identify opportunities and constraints
- Mitigation options?
- Selection of appropriate system

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## Desktop Study

- Undertaken in consultation with the site owner
- Involves the collation and interpretation of available information
- Much can be derived online or from Council and relevant Government agencies and authorities

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## Desktop Study

- Collects preliminary data from readily available sources
- Provides an overview of opportunities and constraints
- Determines what information is relevant
- Identifies information gaps and what additional information is required

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## Imagery

- Satellite imagery [www.google.com/earth/](http://www.google.com/earth/)
- Free to download and activate
- Image quality varies
- Location (latitude/longitude), elevation and has capacity for measurement and historical imagery
- Images can be rotated for different views (including Street View)

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## Topographic Maps

Show:

- Landscape
- Contours
- Anthropogenic (human) features
- Cadastral boundaries
- Grid references
- 1:25,000 maps have 10 metre contours

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## Topographic Maps

Can determine or identify:


- Shape of land
- Drainage direction
- Water bodies and drainage lines
- Slope
- Relief (difference in elevation)
- Aspect (facing direction)

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## Topographic Maps



Topographic map SIX Maps

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## Topographic Maps



Topographic map maps.gosford.nsw.gov.au

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## Maps and Spatial Information

- NSW [www.maps.six.nsw.gov.au](http://www.maps.six.nsw.gov.au)
- NSW [www.nratlas.nsw.gov.au](http://www.nratlas.nsw.gov.au)
- TAS [www.mrt.tas.gov.au](http://www.mrt.tas.gov.au)
- VIC [www.dpi.vic.gov.au](http://www.dpi.vic.gov.au)
- VIC [www.land.vic.gov.au](http://www.land.vic.gov.au)
- WA [www2.landgate.wa.gov.au](http://www2.landgate.wa.gov.au)

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## Geological Maps

- Scanned 1:250,000 geological maps of much of Australia available from Geoscience Australia:
- [www.geoscience.gov.au](http://www.geoscience.gov.au)
- Geological maps of Victoria available from:
- <http://dpistore.efirst.com.au>

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## Geological Maps

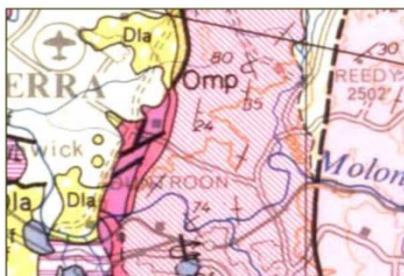
- Select location
- Choose resolution
- Relate landforms
- Solid geology
- Superficial deposits
  - Alluvium
  - Beach deposits
  - Colluvium



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## Geological Map

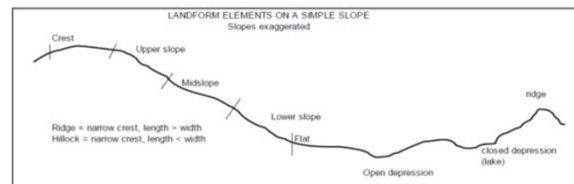


Geology east of Canberra (Geoscience Australia)

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## Landform Elements



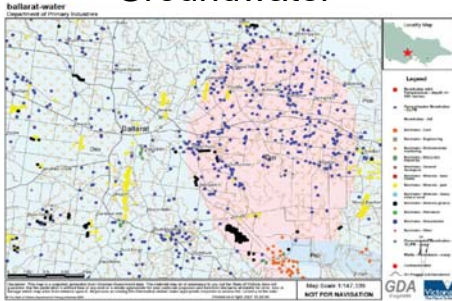
Landform elements on a simple slope

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## Groundwater



Groundwater bores around Ballarat, VIC (NRE VIC)

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## Other Resources

- Vegetation maps
- Bushfire maps
- Special Water Supply Catchment maps
- Flood maps
- Maps of services (water, sewer)
- Local studies

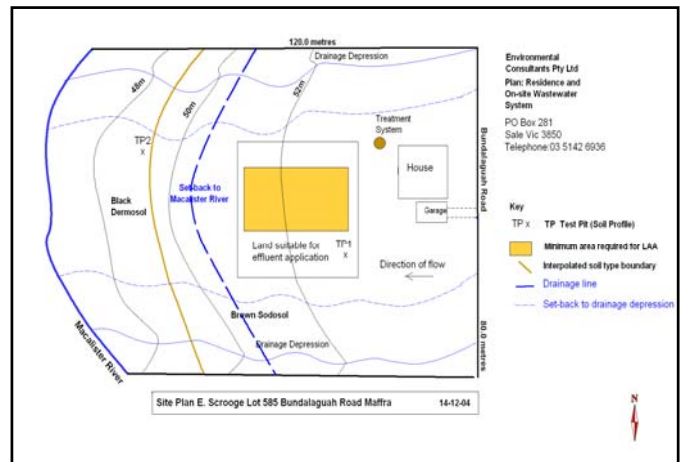
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## Site Plan and Description

- A site plan should be prepared showing, as a minimum; contours, boundaries, location of watercourses, location of any buildings, the wastewater treatment system, and the area available for the application of the treated effluent
- A description of the nature of the key site and soil features

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## Victorian Land Capability Assessment Framework

Document from [www.mav.asn.au](http://www.mav.asn.au)

- Victorian Land Capability Assessment Framework (Word - 1.13MB)

Water Balance resources from [www.onsiteisite.com](http://www.onsiteisite.com)

- VLCAF irrigation area sizing spreadsheet (Excel - 36.4KB)
- VLCAF trench and bed sizing spreadsheet (Excel - 21.3KB)

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## Buffers or Setbacks

- Provide mitigation against unidentified or unintended hazards
- Reduce potential pathways for human and environmental exposure
- Valuable and cost-effective risk management strategy for OSSM
- Appropriate buffer selection based on EPA Code of Practice 891.4 (Table 5) and AS/NZS 1547:2012

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Table 5: Setback distances for primary and secondary treatment plants and effluent disposal/irrigation areas in sewered and unsewered areas (where applicable)<sup>1,2,3,4,5</sup>

Landscape feature or structure	Setback Distances (m)		
	Primary sewage and greywater systems	Secondary sewage and greywater systems	Advanced secondary greywater systems <sup>1</sup>
<b>Buildings</b>			
Wastewater field up-slope of building <sup>1</sup>	6	3	3
Wastewater field down-slope of building	3	1.5	1.5
Wastewater up-slope of cutting/reticulation <sup>2</sup>	15	15	15
<b>Open spaces</b>			
Wastewater field up-slope of adjacent lot	6	3	1
Wastewater field down-slope of adjacent lot	3	1.5	0.5
<b>Infrastructure</b>			
Water supply pipe	3	1.5	1.5
Wastewater up-slope of potable supply channel	300	150	150
Wastewater field down-slope of potable supply channel	30	15	15
Gas supply pipe	3	1.5	1.5
In-ground water tanks <sup>3</sup>	15	7.5	3
Stormwater drain	6	3	2
<b>Recreational areas</b>			
Children's grassed playground <sup>4</sup>	6	3 <sup>5</sup>	2 <sup>5</sup>
In-ground swimming pool	6	3 <sup>5</sup>	2 <sup>5</sup>
<b>Waterways</b>			
Dam, lake or reservoir (potable water supply) <sup>5,6</sup>	300	300 <sup>7</sup>	150
Waterways (potable water supply) <sup>1,8</sup>	100	100 <sup>7,9</sup>	50
Waterways, wetlands (contaminant or ephemeral, non-potable), estuaries, ocean beach at high-tide mark, dams, reservoirs or lakes (stock and domestic, non-potable) <sup>9,8</sup>	50	30	30
<b>Soils</b>			
Category 1 and 2a soils	NA <sup>8</sup>	50 <sup>8</sup>	20
Category 2b to 6 soils	20	20	20
<b>Other</b>			
Vertical depth from base of trench to the highest seasonal water table <sup>8</sup>	1.5	1.5	1.5
Vertical depth from irrigation pipes to the highest seasonal water table <sup>8</sup>	NA	1.5	1.5

## Desktop Summary

- Tabulate data
- Assessment of level of constraint for each relevant site and soil characteristic
- Design on most limiting feature, or
- Engineer out limiting features

## Desktop Study

- Undertaken in advance of and to prepare for field study
- Guides field study
- Identifies data gaps to be filled by field study
- Most importantly, saves time and money

## Into the Field We Go.....

**Desktop Study** – the study will have identified potentially suitable effluent management areas (EMAs) from available information sources. A preliminary constraints map will also identify:

- Appropriate setback areas from natural or built features (existing and proposed)
- Identified physical constraints (e.g. bedrock, fill)
- Data gaps (areas for investigation)
- Regional soil landscapes (including boundaries)
- Recommended soil (test pit) locations
- Indicative groundwater depth

