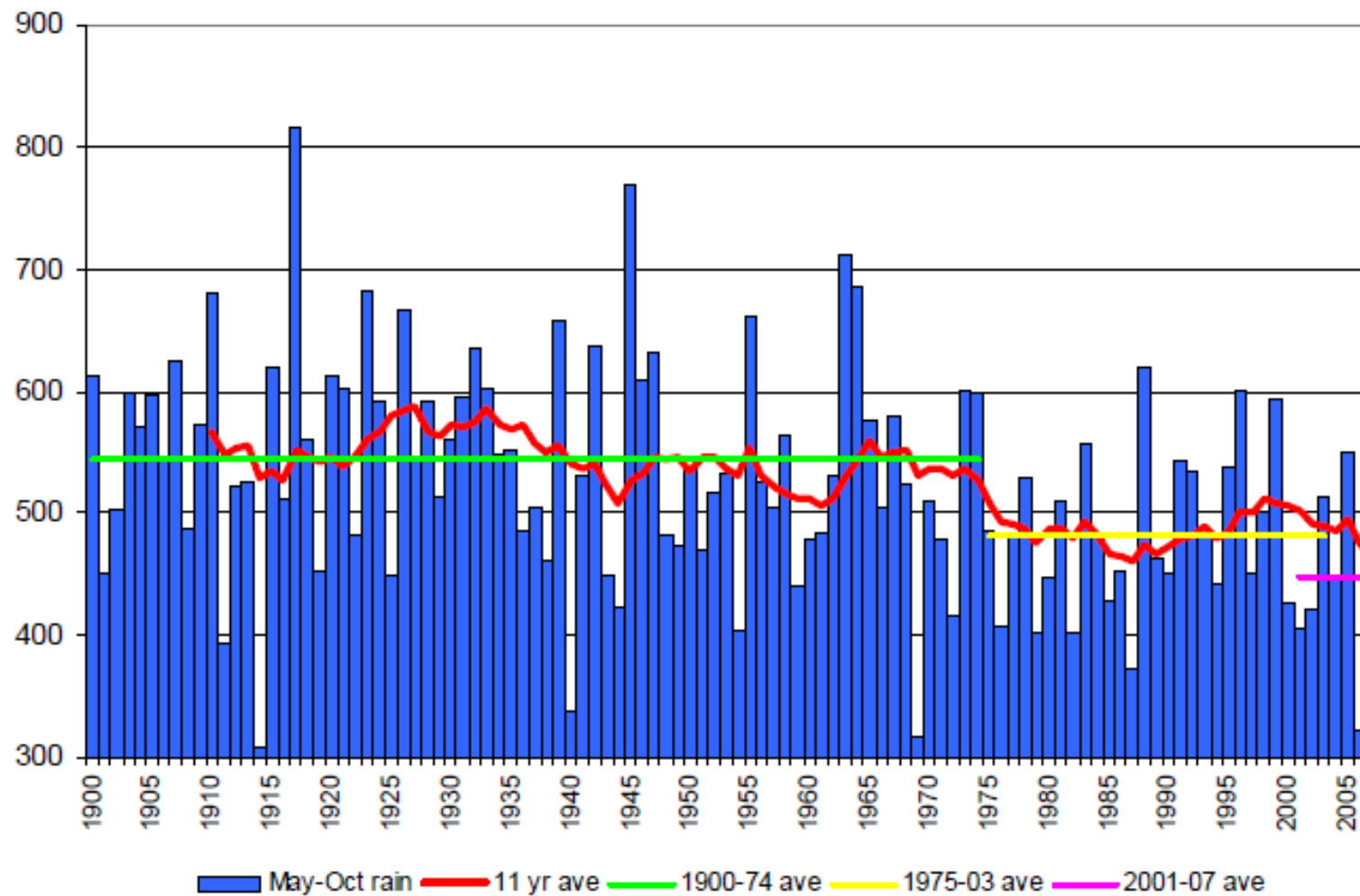


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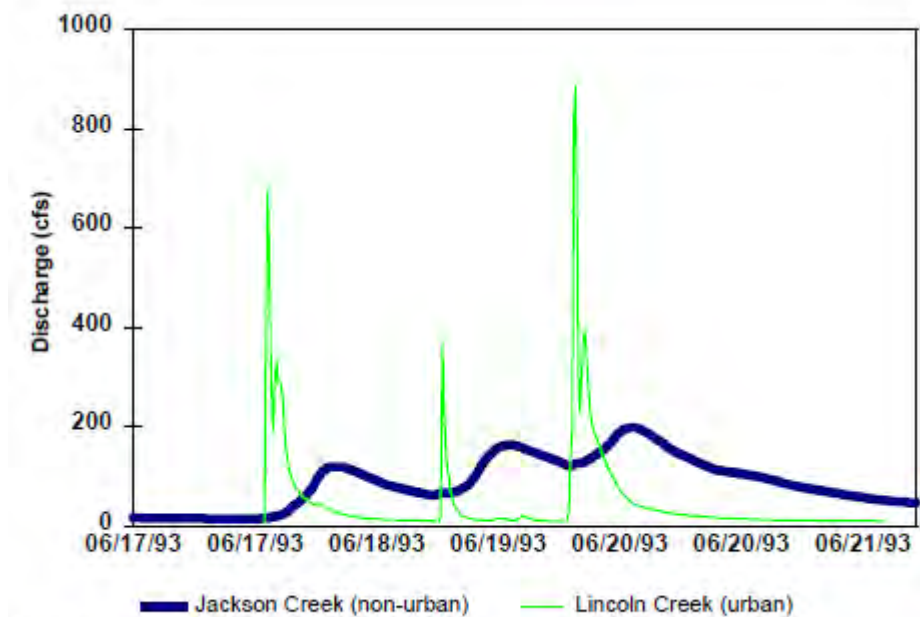
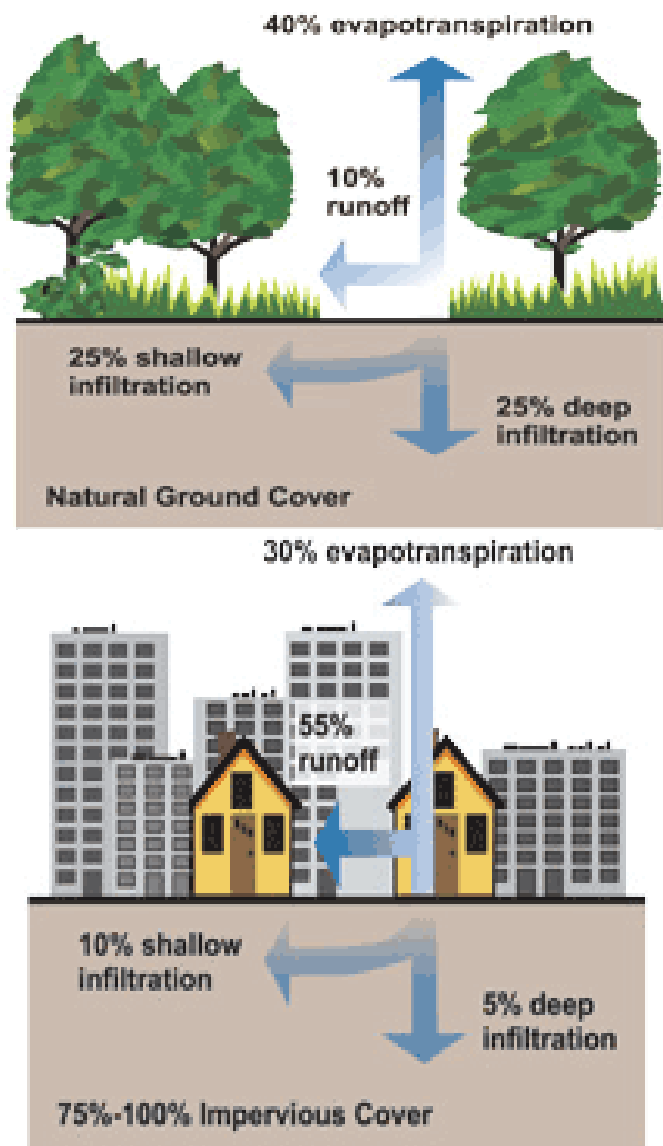
An industry perspective

1. Development Process and Regulatory Requirements
2. Options for Water Sensitive Urban Design
3. Changing Behaviours and Attitudes



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Source: Masterson and Bannerman, 1994

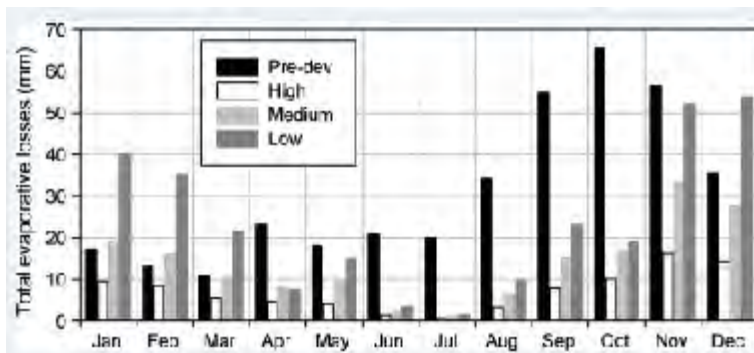
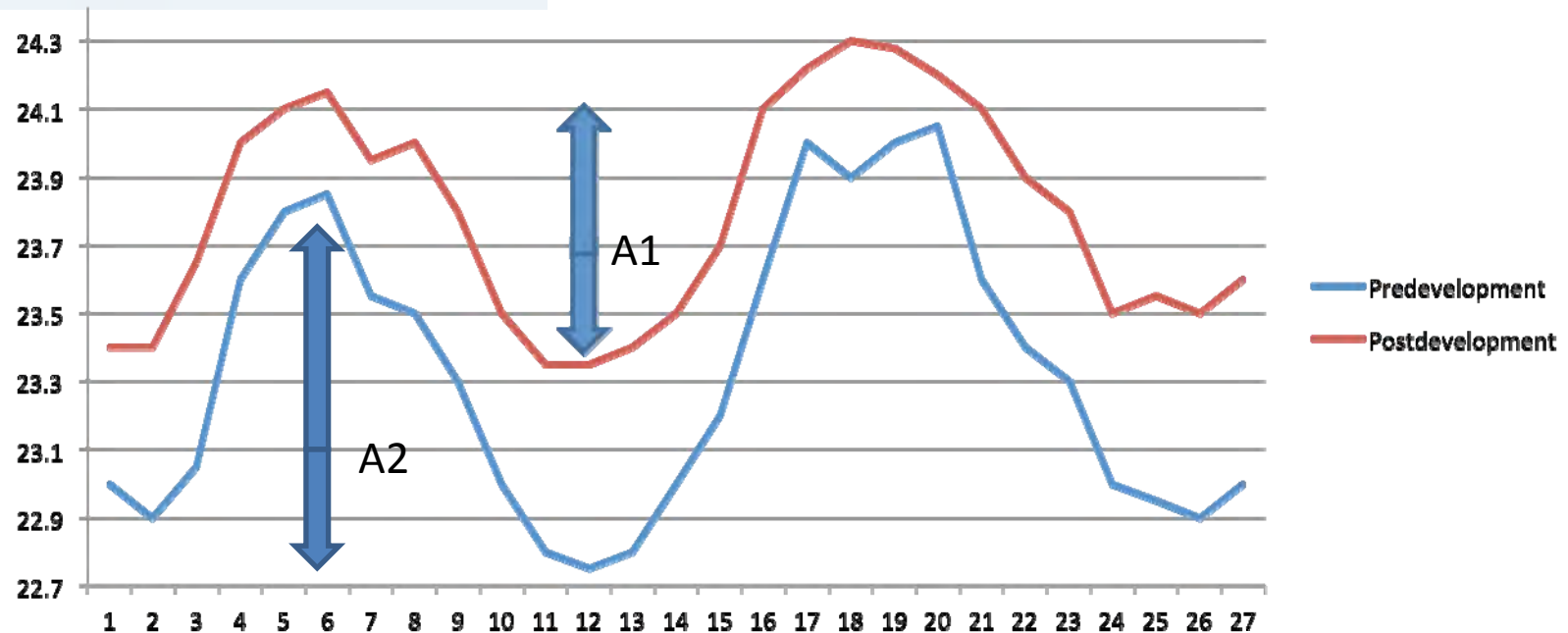
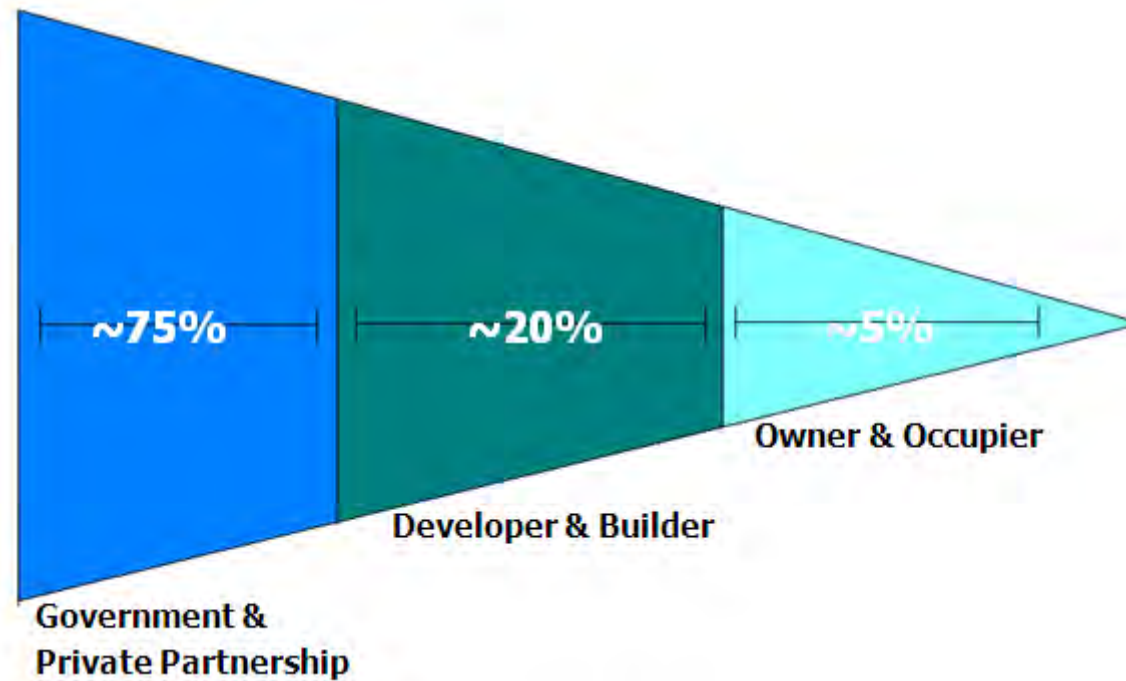
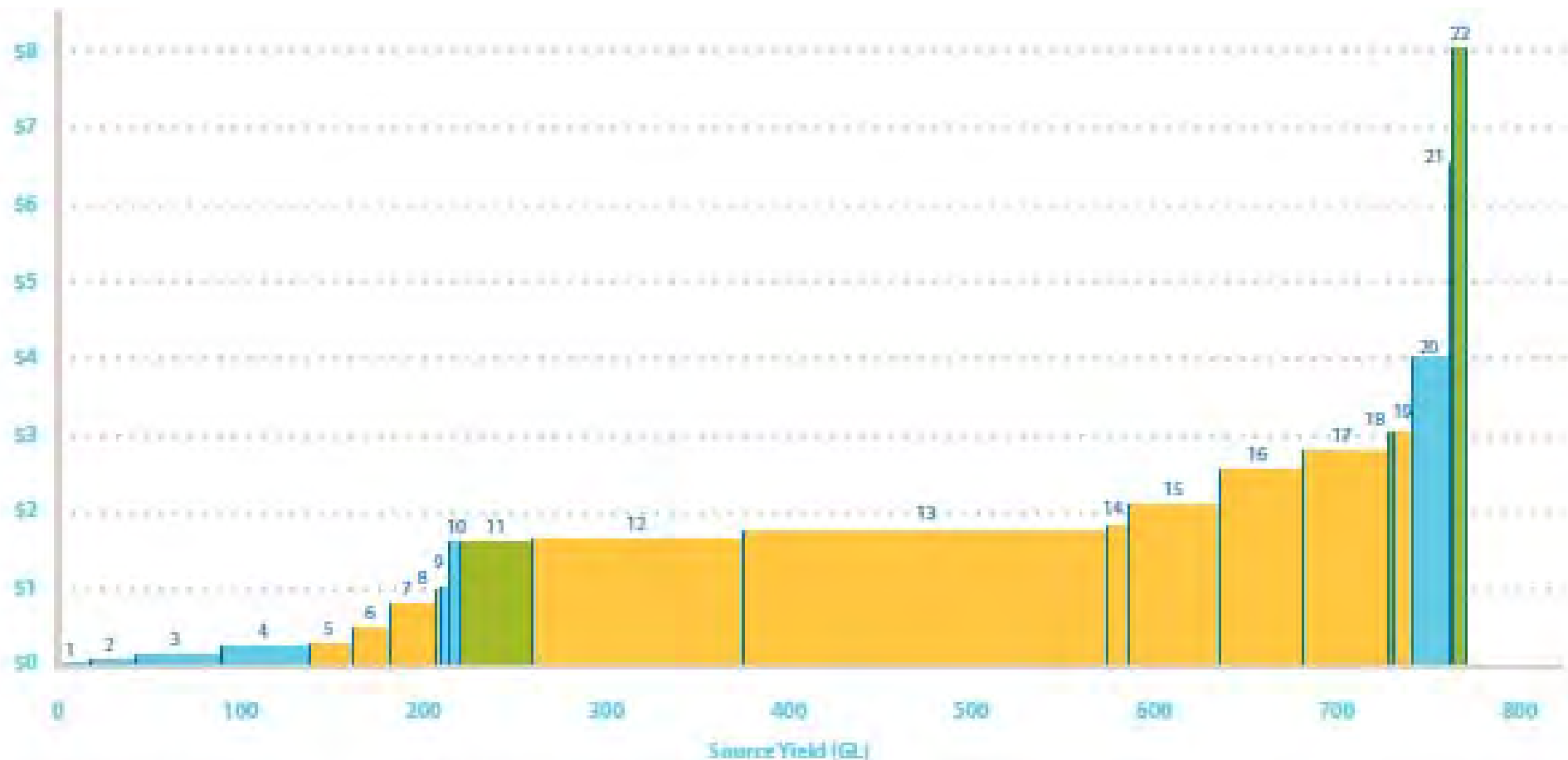


Fig. 9. Total monthly evaporative losses from shallow groundwater table, soil and transpiration from deep-rooted vegetation for pre-development conditions and three densities of urban development for 2002 (for scenarios with no groundwater abstraction).



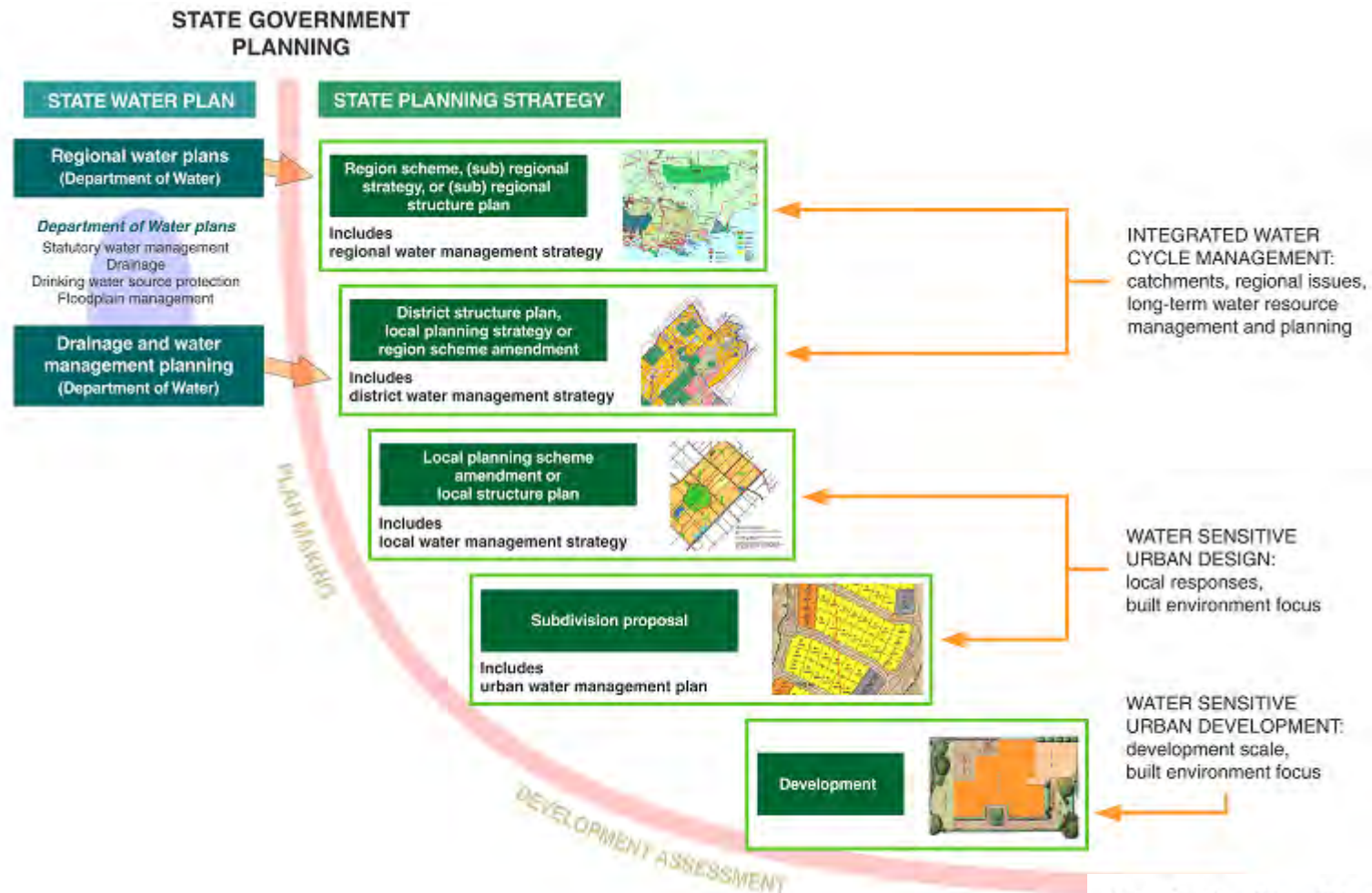
Development Process and Regulatory Requirements





- | | | | |
|-----------------------------|--|--|--|
| 1 Increased Urban Density | 7 North West Metro Coastal Groundwater | 13 New Desalination Sites | 19 Esperance - Kalgoorlie Desalination |
| 2 Urban Form | 8 Jandakot Groundwater Expansion | 14 Wellington Dewatering | 20 Rainwater Tanks |
| 3 Technological Advancement | 9 Garden Bores | 15 Southern Seawater Desalination Pt 2 | 21 Sewer Mining Systems |
| 4 Behavioural change | 10 Community Bores | 16 Wellington Dam Desalination | 22 Greywater Systems |
| 5 Catchment Management | 11 Industrial Recycling | 17 Gingin - Jurien Groundwater | |
| 6 Gnanigara Water Trading | 12 Groundwater Replenishment | 18 Community Greywater | |

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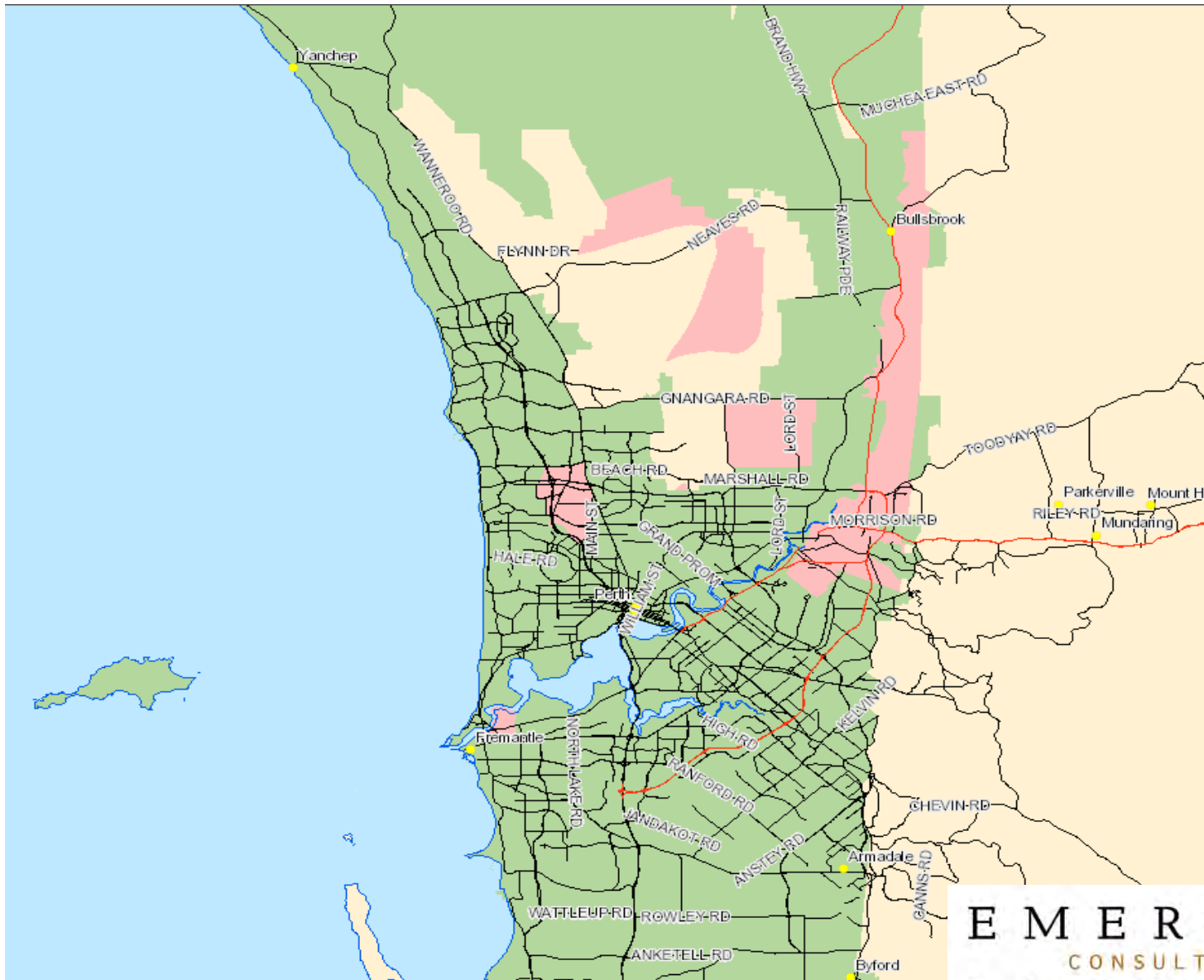
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DoW
DoHealth
LGAs
SRT
EPA
DEC
WAPC/DoP
DEWHA – Federal

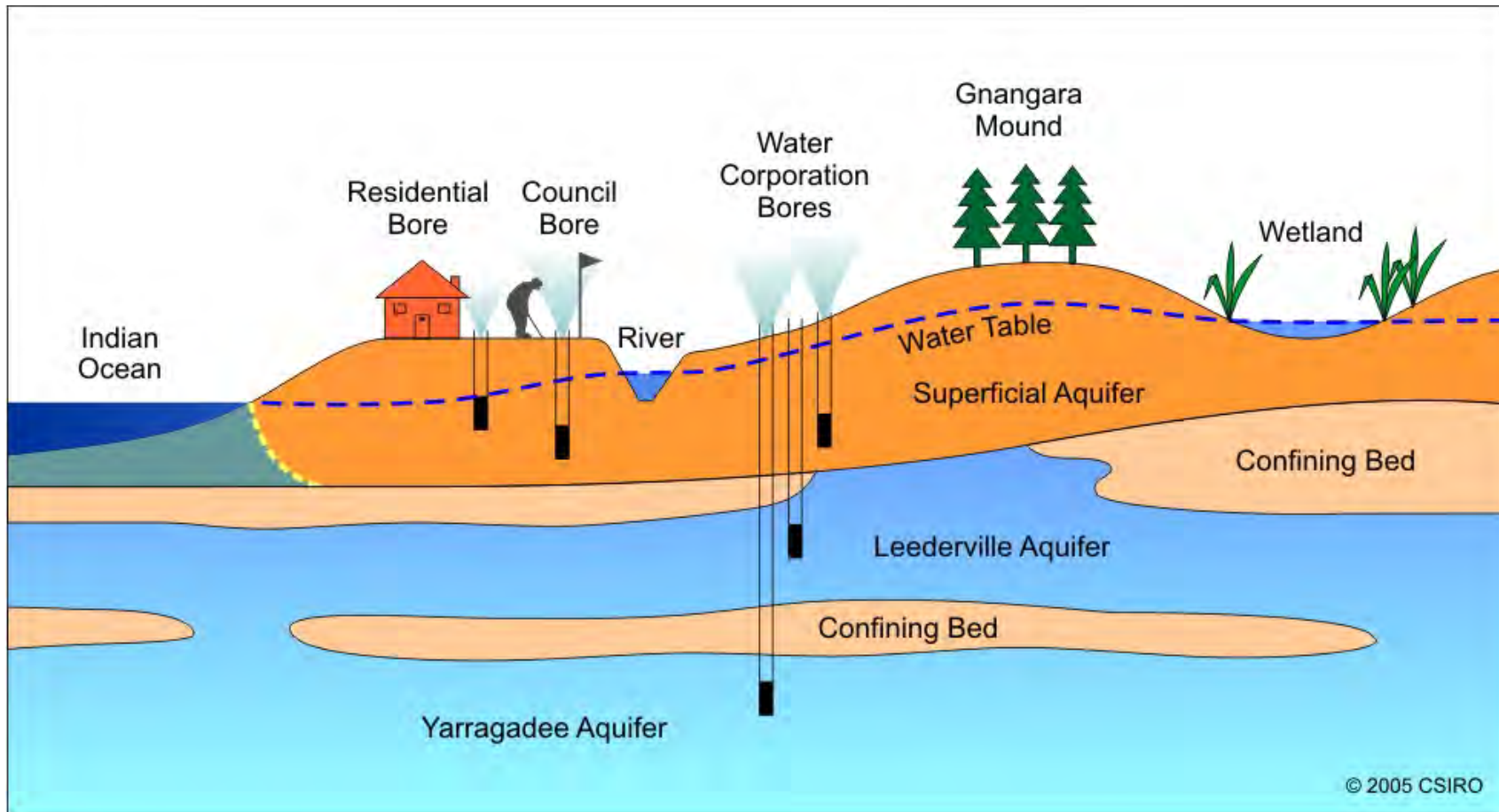
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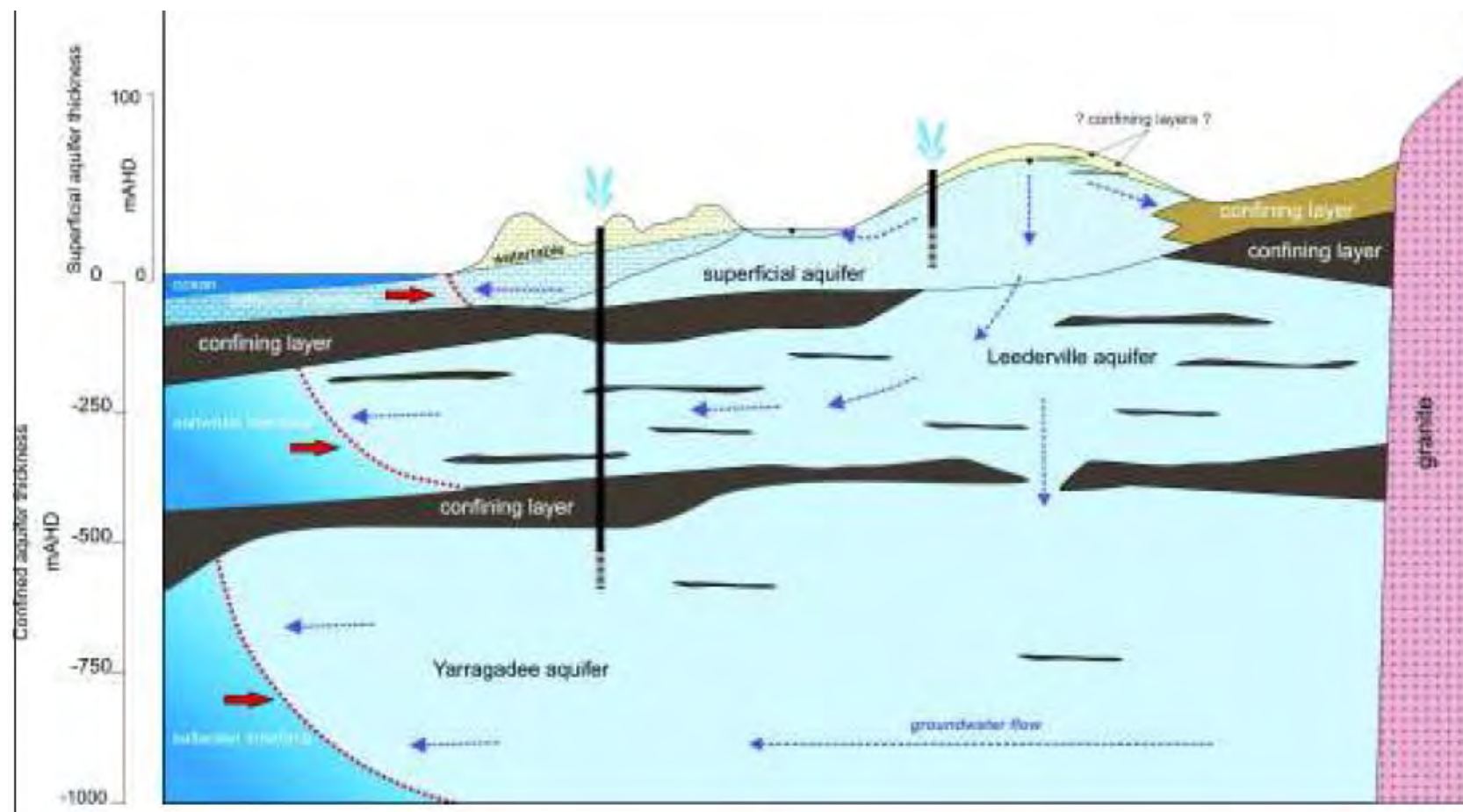
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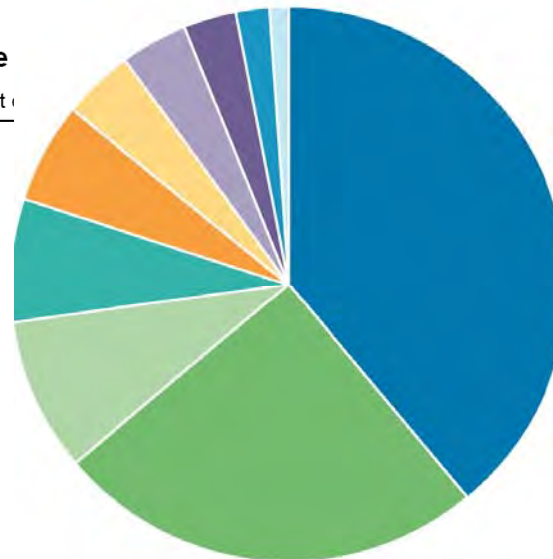
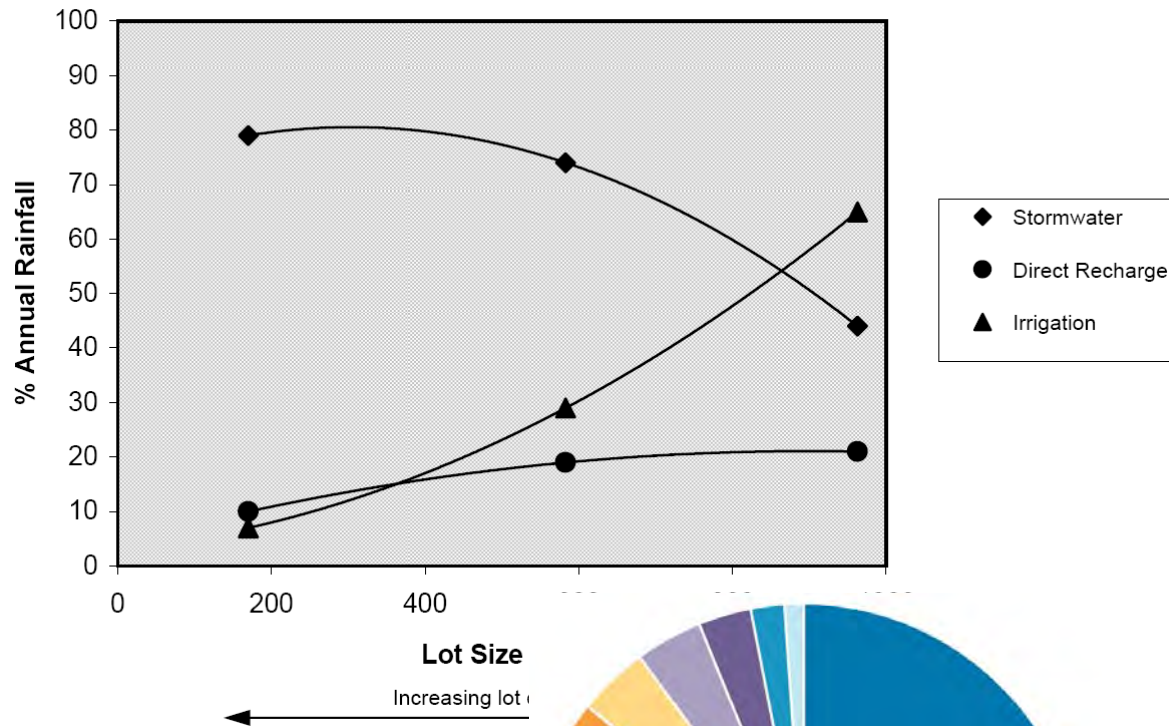
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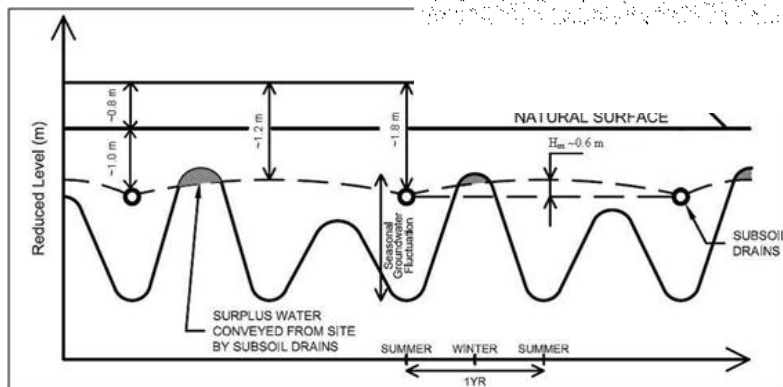
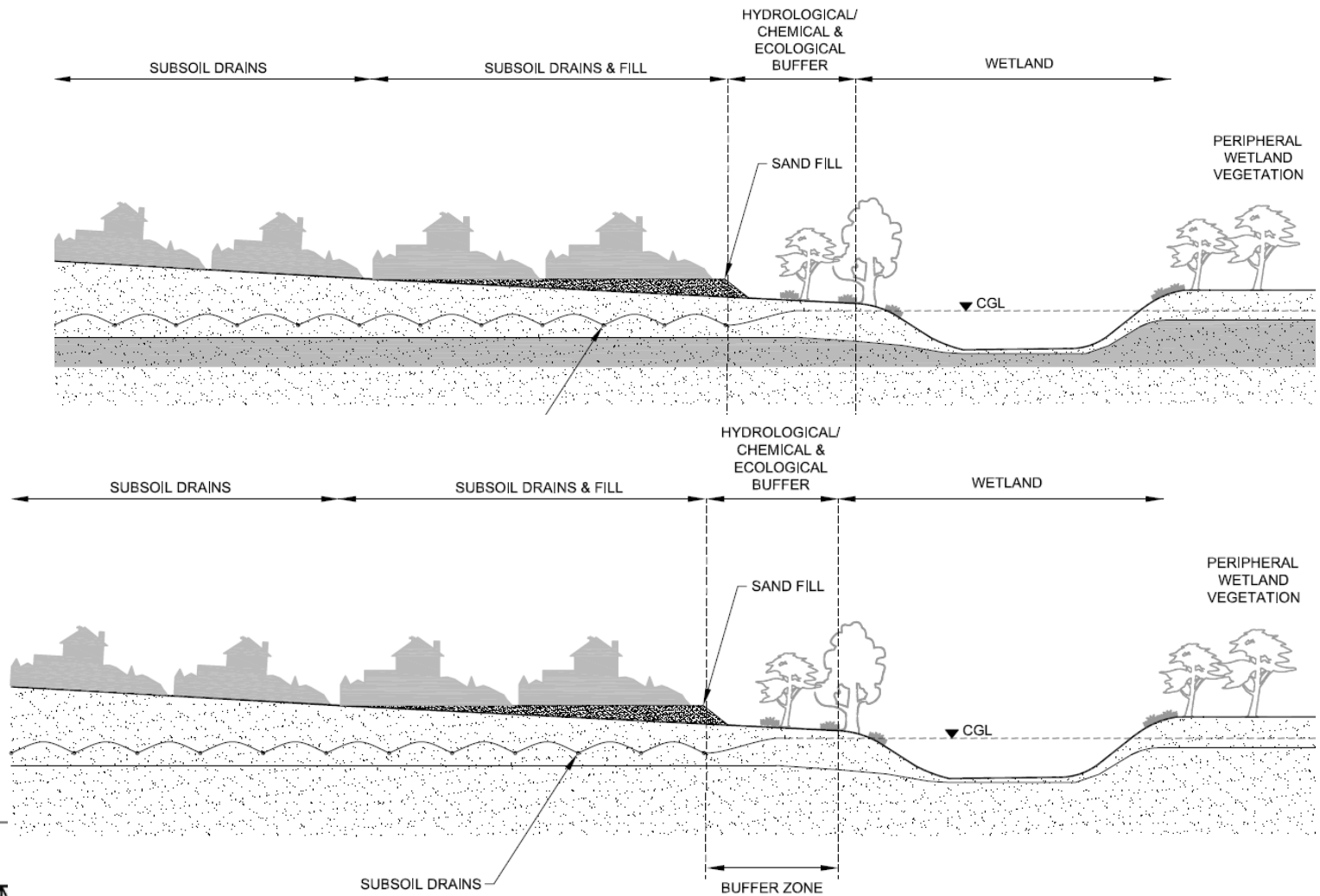


Effect of Lot Size on Water Balance

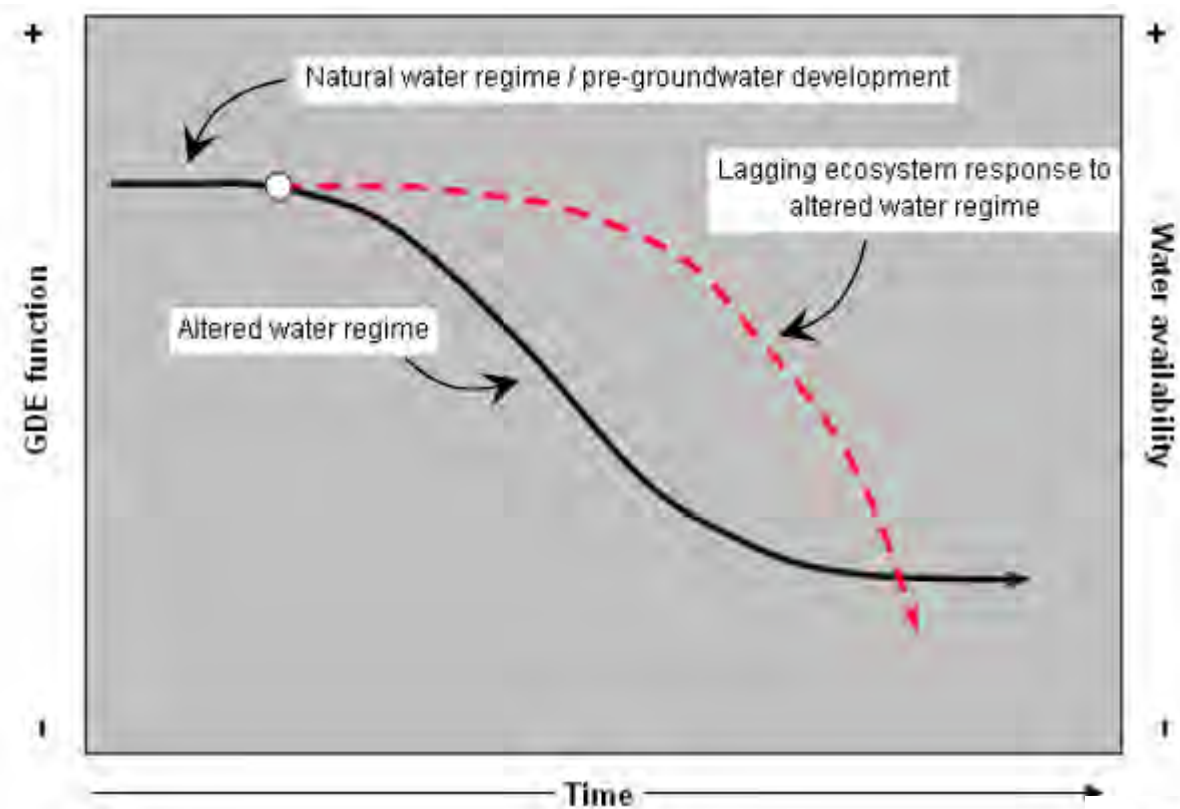


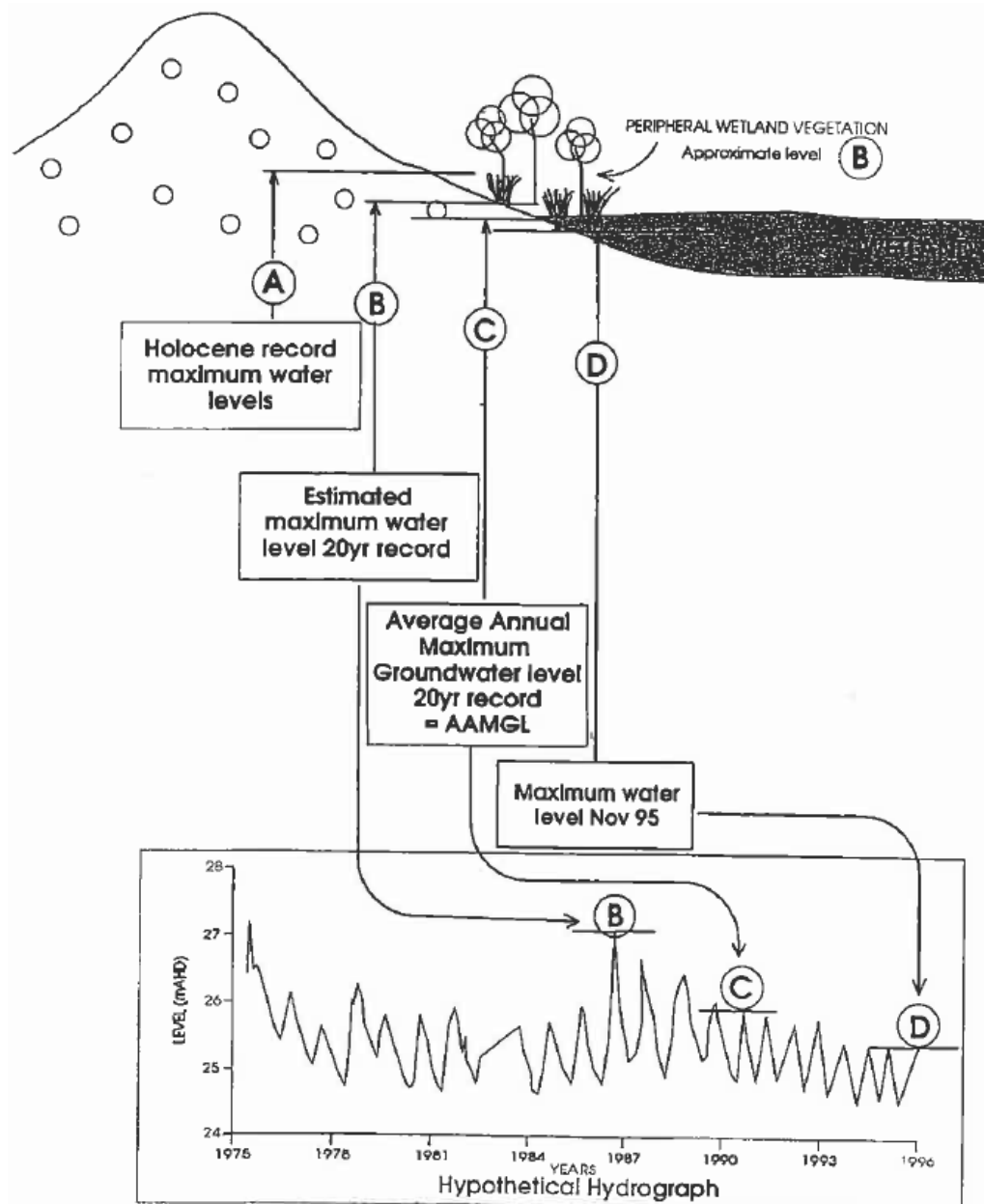
- Irrigation 39%
- Shower and bath 25%
- Toilet 9%
- Washing machine 7%
- Taps 6%
- Evaporative air conditioner 4%
- Leaks 4%
- Handwatering 3%
- Pool & spa 2%
- Dishwasher 1%

Average Perth residential water use, by area (%)



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1. Pointless using EWRs & GDEs unless the work can and is checked. Current surrogate is AAMGL which is only good if the system is connected. If perched, is this process necessary? Especially when it has meteoric processes only
2. The current guidelines are event based only. This works well for surface water, though most of our systems are interconnected with groundwater. Groundwater is volume based and therefore some of the guidelines are not truly applicable. Design criteria need to be reviewed on groundwater systems. We are not experiencing massive failures in design. This is due to lower than long term averages in groundwater levels (caused by meteoric rainfall) – see open drain which are now dry. The current systems are suggested to be oversized due to be event based rather than volume based
3. Water conservation from a developer at subdivision with local government authority is limited. In reality the majority of efficiency and change needs to come from a larger strategic basis at a regional context (an all of government approach). Private utilities (to reduce monopolies found within WA) and decentralisation will help in this matter
4. The limiting factor for potable water is \$1/KL and the cost of alternatives are too high