SYSTEMS MODELLING AS AN AID TO CAPACITY BUILDING

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PROPOSITION

Capacity building, for workforce and community, can be aided by a formal systems modelling approach.

What is a systems model?

It is a representation of a problem and/or physical system that establishes the *critical components* and focuses on the *interactions* between them rather than the details of how the components function.
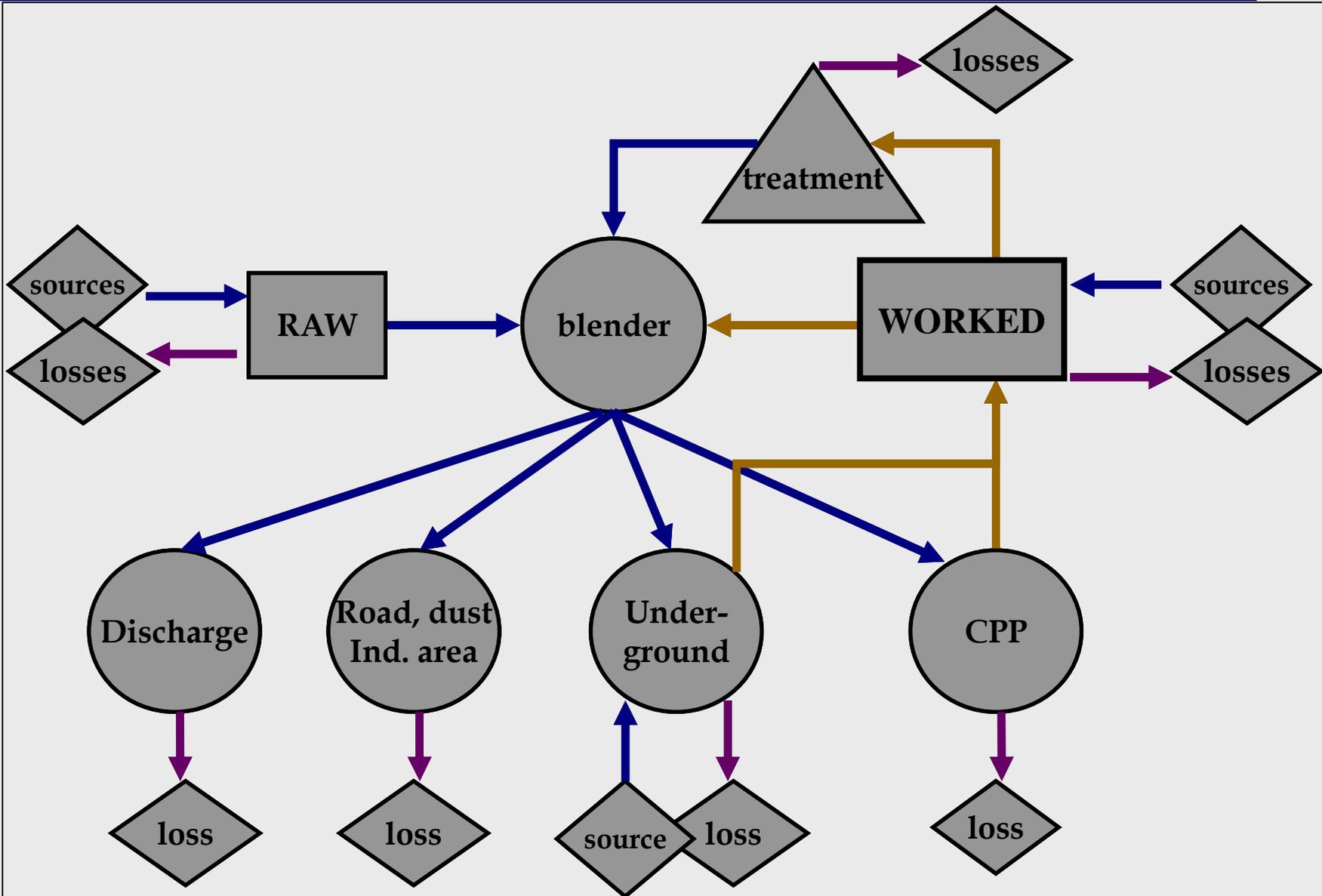
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TYPES OF MODELS
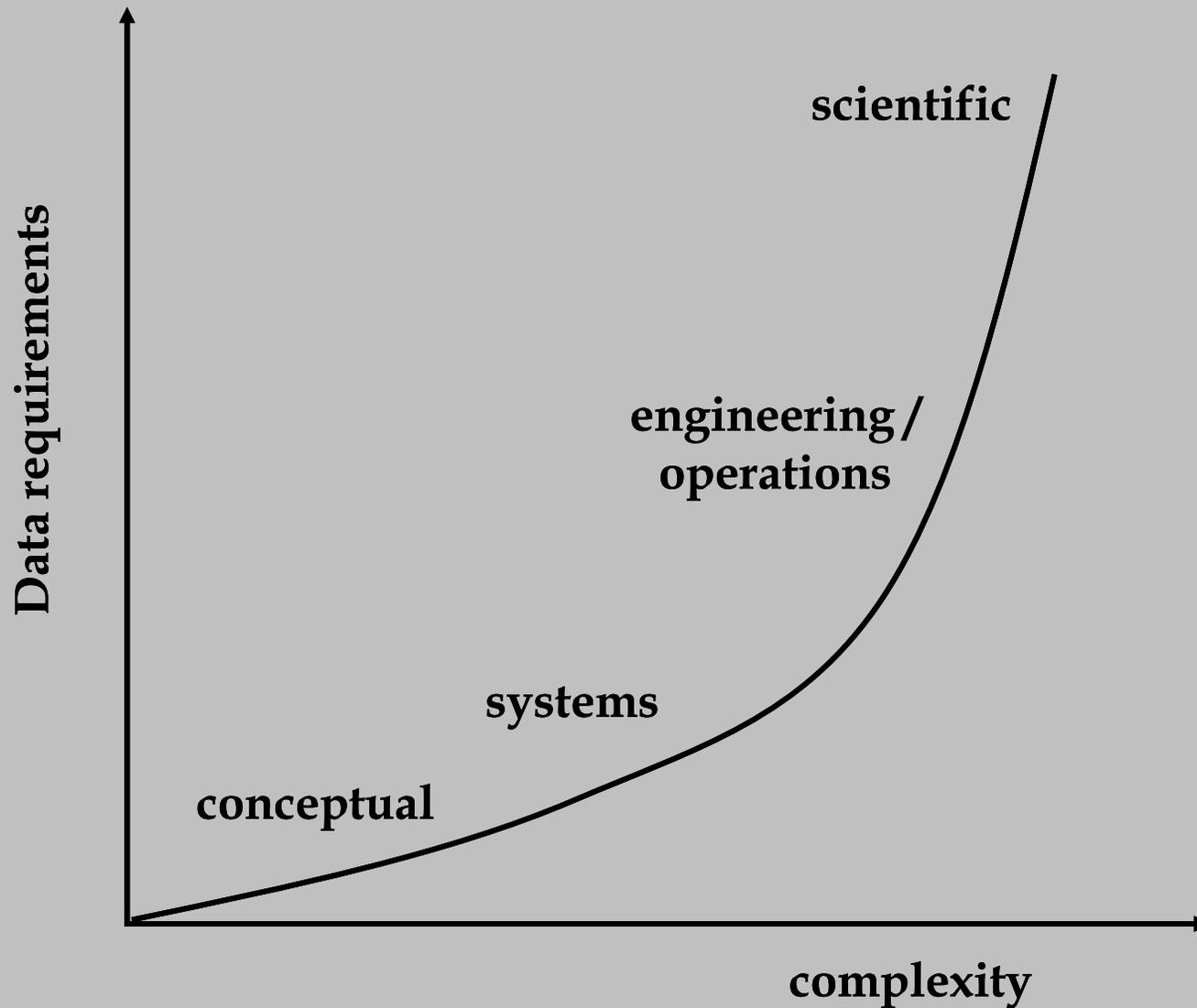
EXAMPLE:
Mine site water management

NOT A SYSTEMS MODEL

SYSTEMS MODEL

EXAMPLE OBJECTIVES

		Conceptual model – system levels		
		Governance	Surrounding community & environment	Site/technical
Best practice layer	Technical performance	1.Adopt leading practices for water use productivity (ML/Mt) in coal preparation and underground mining.	1.Minimise discharge of worked water. 2.Minimise use of fresh water (the minimum fresh water requirements are potable water, fire fighting and 5% CHPP make-up for vacuum pumps)	1.There should be no loss of production due to inability to supply fit-for-purpose water.

LEADING PRACTICE EXAMPLE:
INFORMATION + SYSTEMS MODEL
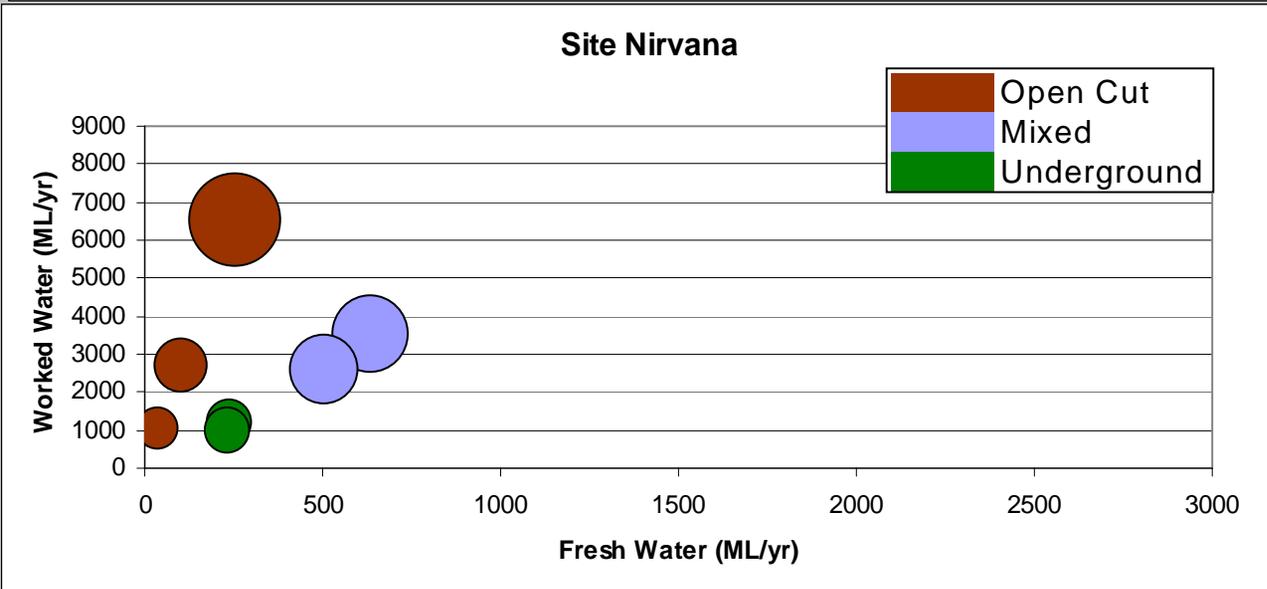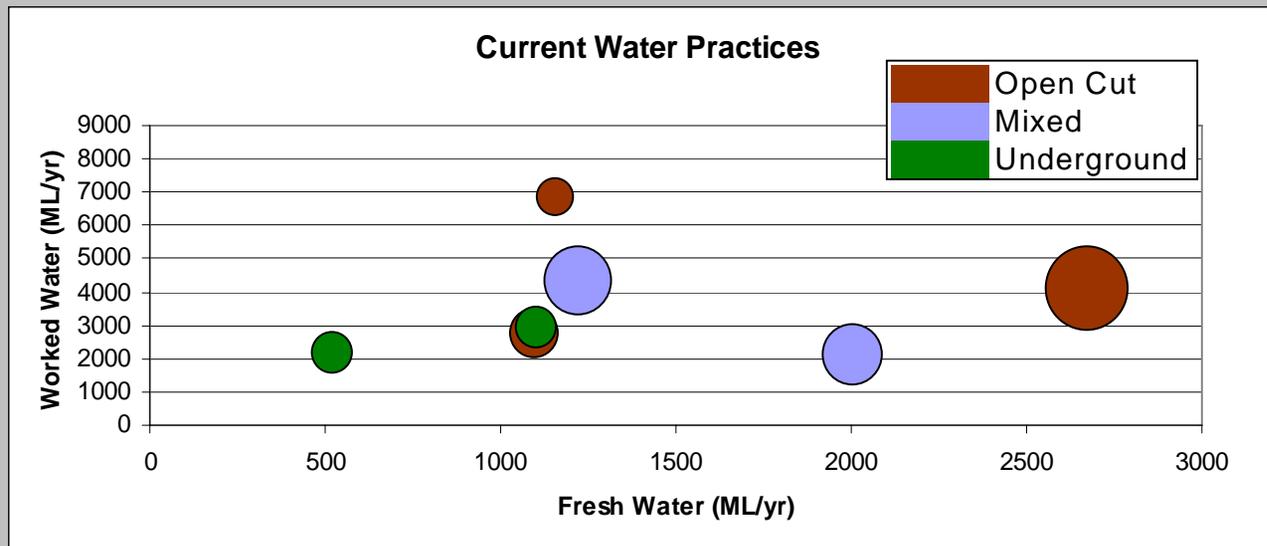
Current
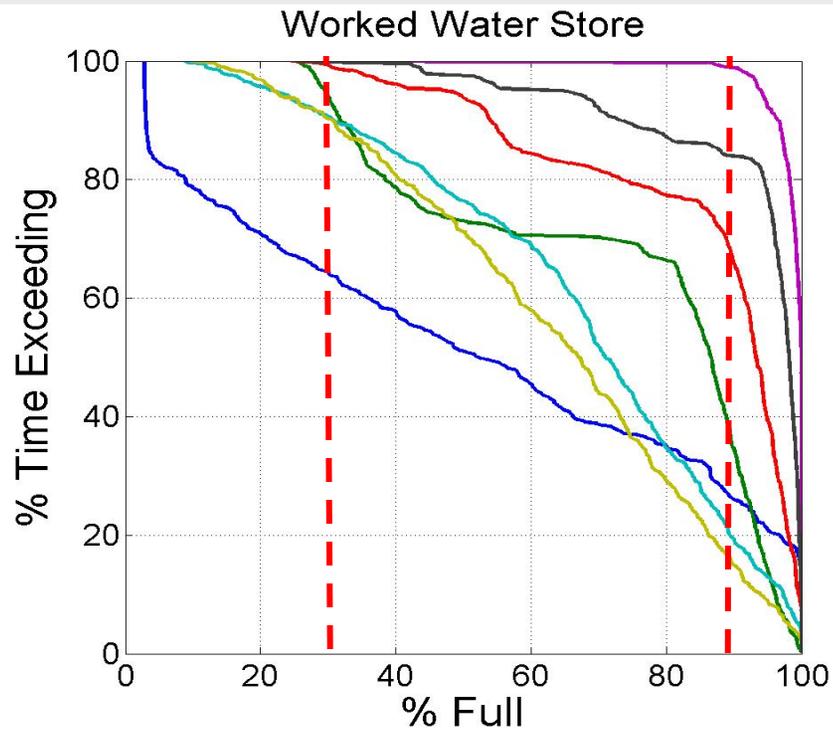
Site Nirvana
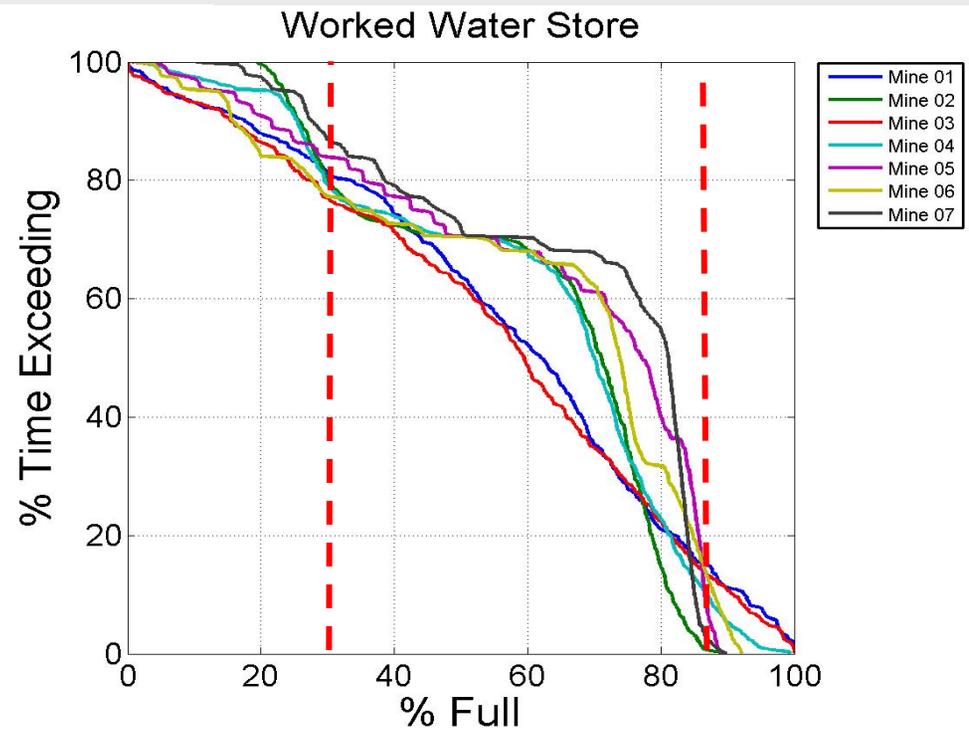
SUMMARY OF SITE CHANGES
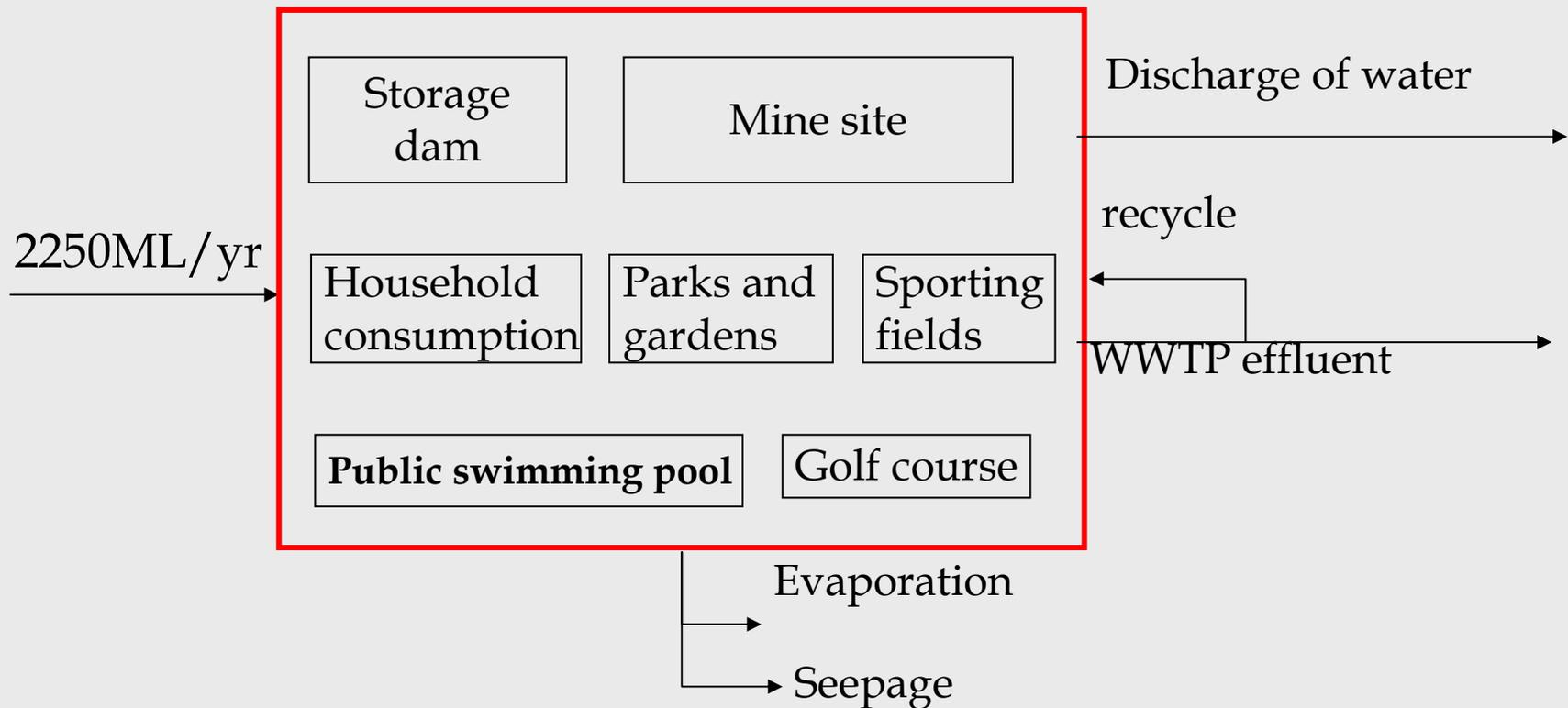## MIN FRESH WATER USE + LEADING RATIOS +:

		Worked Water Storage Capacity (ML)			Drainage Area (ha)			Evap. control
		Current	Practice	Inc.	Current	Practice	Inc.	25% red.
Mine 1	O/C	226	2750	12.2	1683	2104	1.3	✔
Mine 2	Mixed	16000	17000	1.1	4088	4088	1.0	✘
Mine 3	O/C	10000	10000	1.0	6289	9434	1.5	✔
Mine 4	O/C	1600	7000	4.4	896	896	1.0	✔
Mine 5	U/G	802	34000	42.4	1891	1891	1.0	✘
Mine 6	U/G	908	22750	25.1	661	1900	2.9	✘
Mine 7	Mixed	16210	40000	2.5	3641	3641	1.0	✘

SUMMARY OF SITE PERFORMANCE

Current Water Practices

Legend: Open Cut, Mixed, Underground

Y-axis: Worked Water (ML/yr), X-axis: Fresh Water (ML/yr)

Site Nirvana

Legend: Open Cut, Mixed, Underground

Y-axis: Worked Water (ML/yr), X-axis: Fresh Water (ML/yr)

Expanding the system

System Boundary

Multiple mines and other users

DISCUSSION