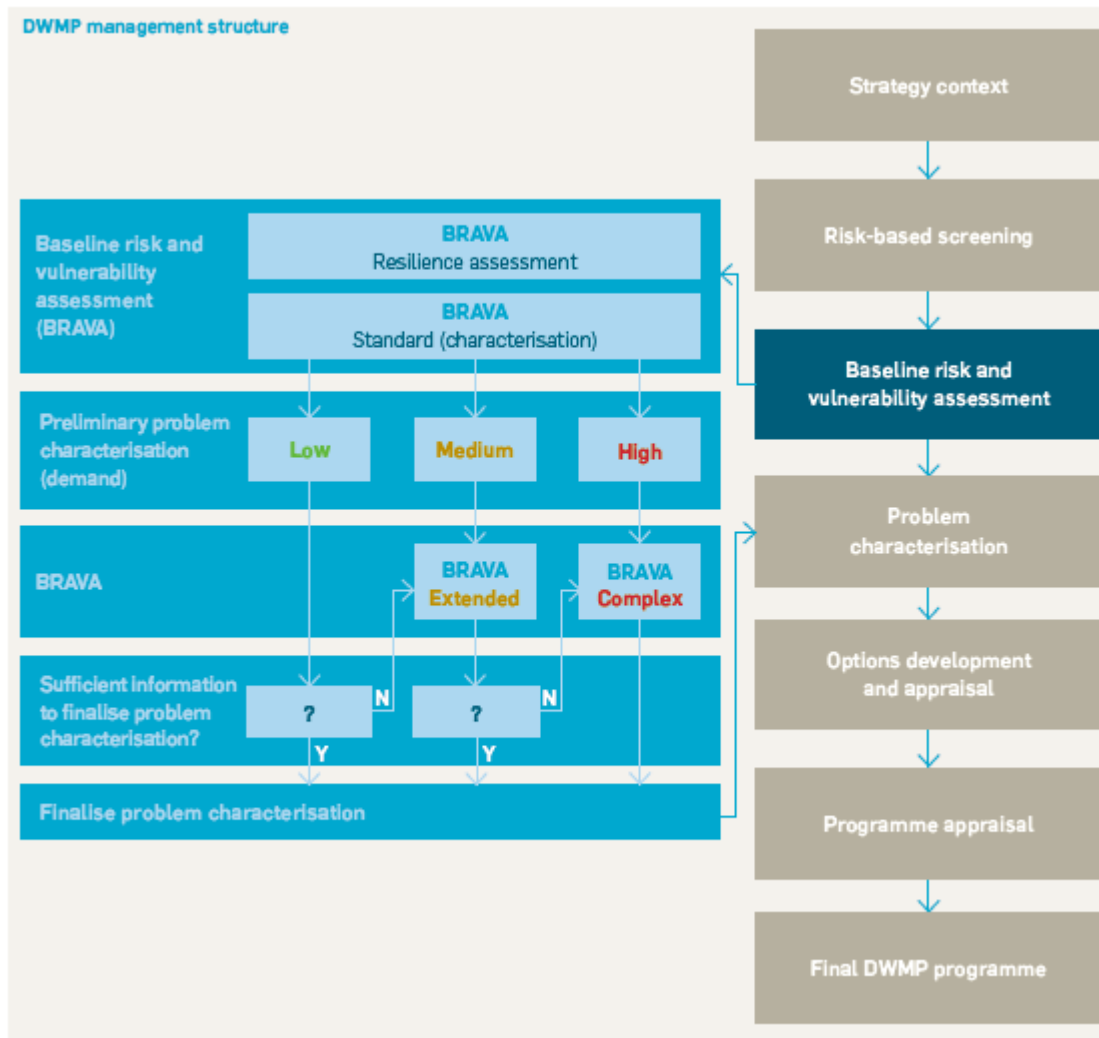


Introduction to Baseline Risk and Vulnerability Assessment

Alice Cardew
United Utilities

What is the aim of this step?

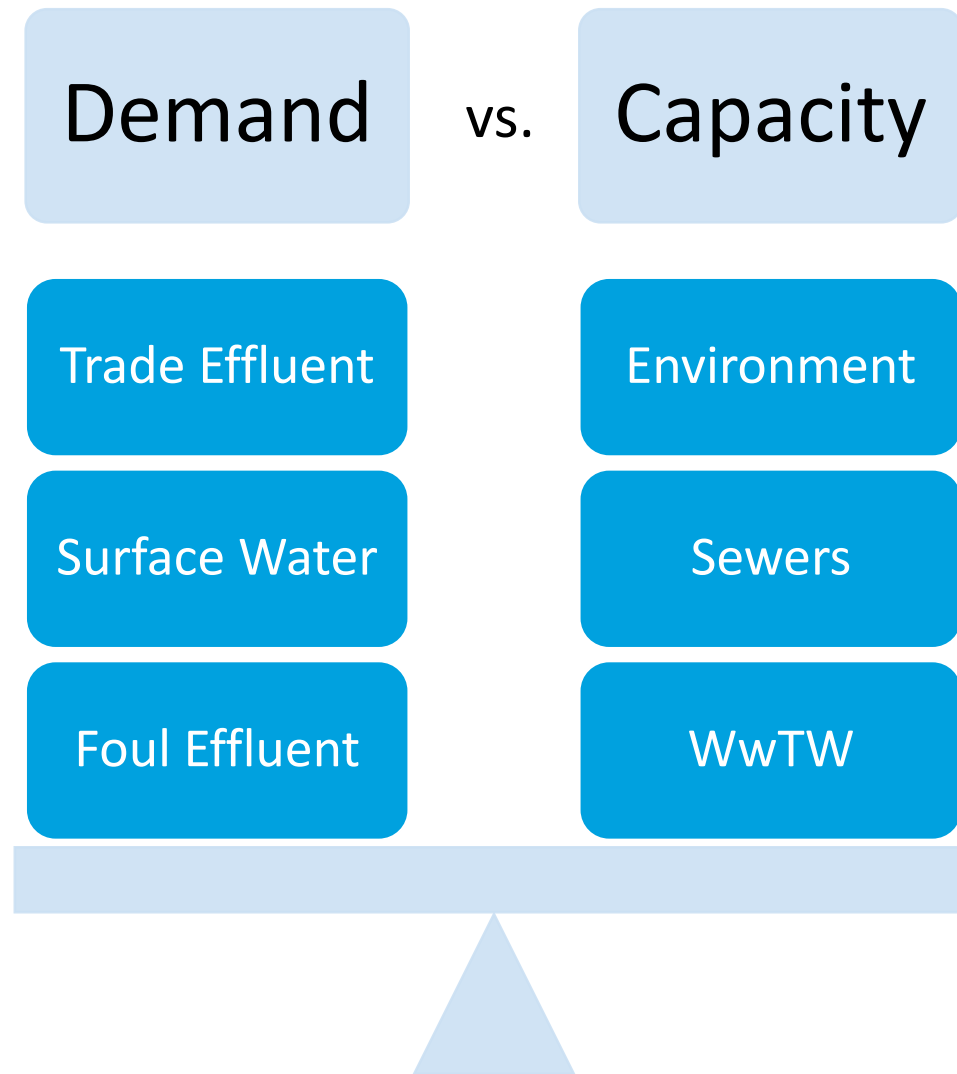


To understand the risk of a service failure and when it is likely to occur

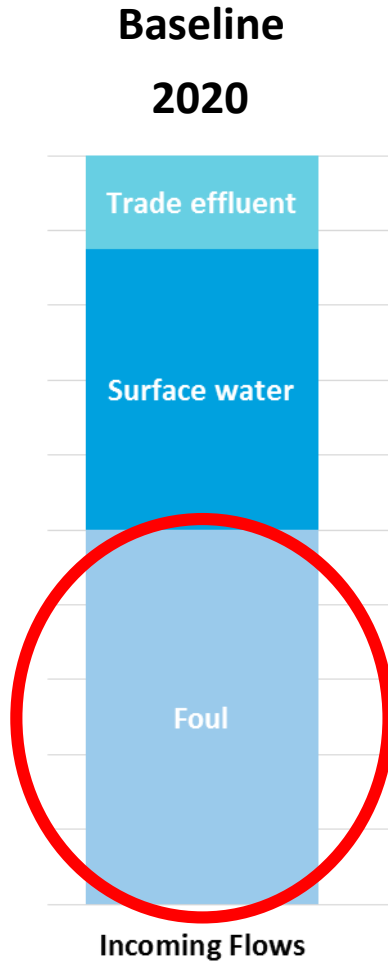
This can be due to:

- Long term pressures
- Significant events

It's about balance – vulnerability to long term pressures



Understanding Demand

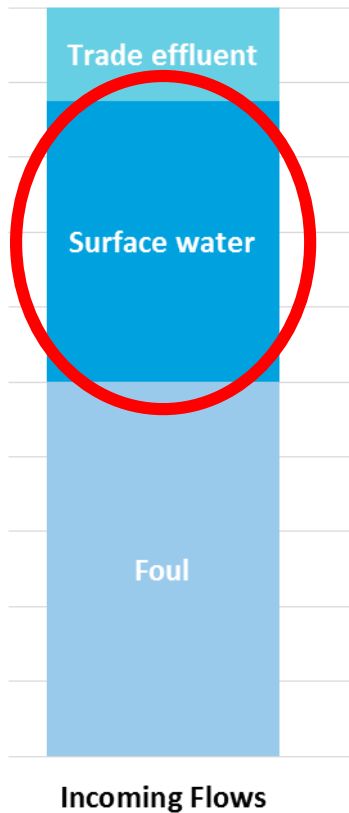


To understand how foul flow and loads will change we need to consider population and behavioural changes:

- Local Development Plans
 - What stage is the plan at?
 - Where is the growth?
 - What is the phasing of the development?
- Review historical growth to understand infill growth rate
- Occupancy rates – today and in the future
- Growth forecasts from the Water Resources Management Plan
- Per capita consumption forecasts

Understanding Demand

Baseline 2020

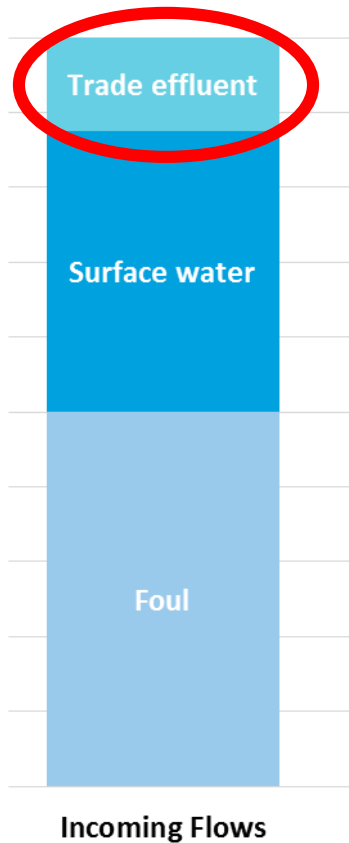


To understand how surface water flows will change we need to consider:

- Impact of climate change
- Changes in base flow infiltration
- Future urban creep

Understanding Demand

**Baseline
2020**



To understand how trade effluent flow and loads will change we need to consider:

- Future economic growth and the differences that might have on different sectors
- Local Development Plan
- Potential for pre-treatment by certain traders

Understand Capacity



Drainage Capacity

- Hydraulic models

Treatment Capacity

- Process models
- Hades models

Environmental Capacity

- SAGIS/ Simcat models
- ICM
- Coastal models

Standard BRAVA

1. Assess base year performance

Current flows and loads

Current asset capacity and performance



2. Assess future performance

5, 10 and 25 year forecast flow and loads

Central growth estimate **only**



3. Are planning objectives breached?

If yes, proceed to preliminary problem characterisation

Preliminary Problem Characterisation

		Strategic needs score ("How big is the problem")			
		Negligible	Small	Medium	Large
		1-2	3-4	5-6	7-8
Growth (demand) forecast uncertainty	High				
	Medium				
	Low				

- Standard BRAVA only tests a central growth estimate to see if a planning objective will be failed.
- If there is high level of uncertainty in that growth estimate or the problem identified is very large it is useful to test more scenarios to fully understand the problem.



Extended

±30% growth forecast



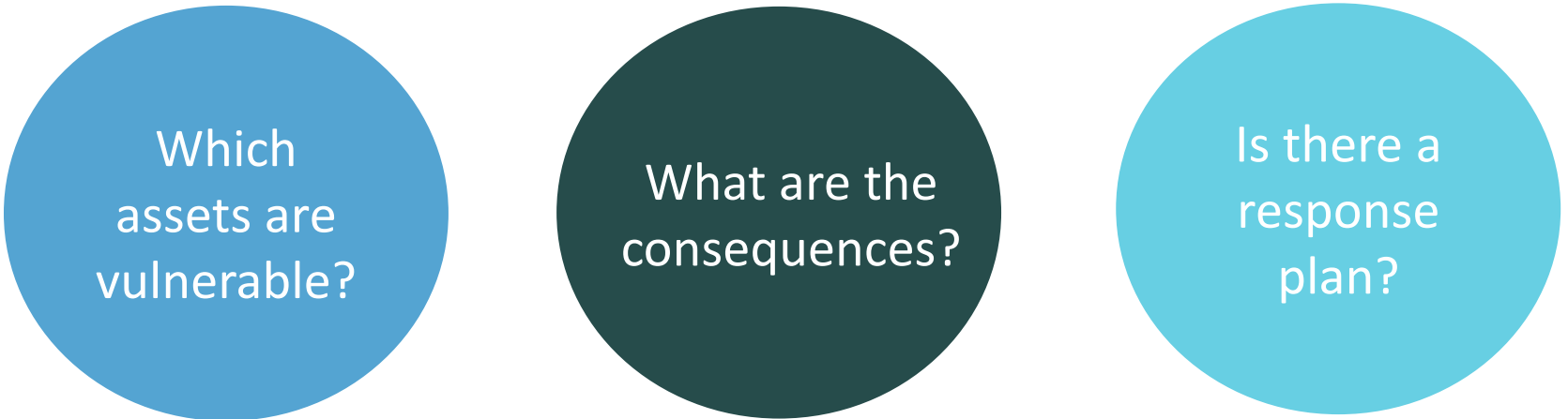
Complex

Apply multiple ± uplifts to growth projections

Resilience Assessment – Significant Events

The aim of this assessment is to understand whether planning objectives may be breached due to a significant event such as:

- i. flooding
- ii. power outage
- iii. communications outage



Which
assets are
vulnerable?

What are the
consequences?

Is there a
response
plan?

Any questions?

Breakout Session

- We now have 40 minute breakout session with another 20 minutes at the end for groups to feedback.
- There are 4 groups of questions: 2 related to RBCS, 2 related to BRAVA

RBCS Breakout

In your respective groups, the 16 indicators haven been split into 'Environmental' and 'Capacity' catchment needs. For each indicator, using *Post-it Sticky Notes*, can we please have your comments on:

A. What are the **STRENGTHS** of this metric?

(What do you like about this indicator? How will it drive the right behaviours?)

B. What are the **WEAKNESSES** of this metric?

(How could it be improved?)

C. Are there any **CONSISTENCY** issues

(Is the criteria clear – if not why?)

D. How could it inform DWMP **strategy development**?

(How would you use this indicator to develop strategic options?)

Group 1	Group 2
2: Intermittent discharge impacts upon bathing or shellfish waters. 3: Continuous/intermittent discharges to sensitive waters. 4: Storm Overflow Assessment Framework (SOAF) 8: Pollution incidents (category 1, 2 and 3) 9: WwTW quality compliance 10: WwTW flow compliance 11: Storm overflow spills 14: WINEP	1: Wastewater 1 in 50 year resilience 5: Capacity Assessment Framework (CAF) 6: Internal sewer flooding 7: External sewer flooding 12: Other RMA drainage systems 13: Planned residential new development 15: Sewer collapses 16: Sewer blockages

Breakout

2

Discharges to bathing or shellfish waters

3

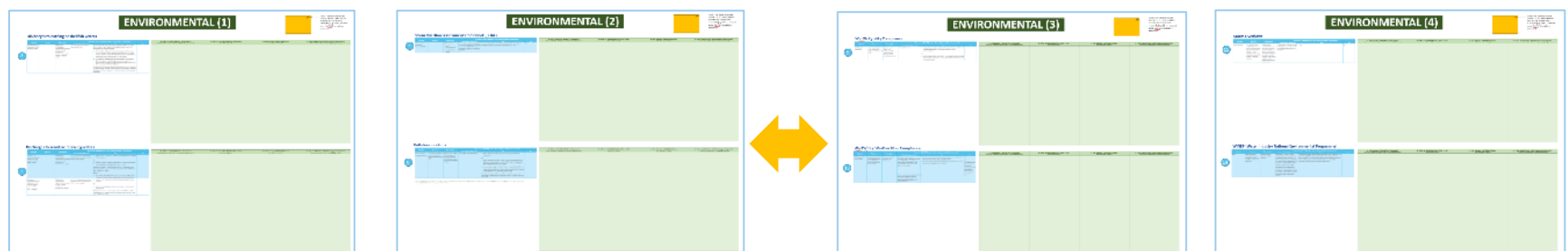
Discharges to sensitive receiving waters

ENVIRONMENTAL (1)

ABCD

<p>A. Influence the REPUTATION of the asset?</p>	<p>B. Influence the REPUTATION of the asset?</p>	<p>C. Influence the REPUTATION of the asset?</p>	<p>D. Influence the REPUTATION of the asset?</p>
<p>A. Influence the REPUTATION of the asset?</p>	<p>B. Influence the REPUTATION of the asset?</p>	<p>C. Influence the REPUTATION of the asset?</p>	<p>D. Influence the REPUTATION of the asset?</p>

- A. What are the **STRENGTHS**?
What do you like about this indicator?
How will it drive the right behaviours?
- B. What are the **WEAKNESSES**?
How could it be improved?
- C. Any **CONSISTENCY** issues
Is the criteria clear – if not why?
- D. How could it inform DWMP **strategy development**?
How would you use this indicator to develop strategic options?



Questions

Group 3

A catchment has been identified as vulnerable through the risk based catchment screening due to high levels of internal flooding and planned development

- a. What data would you want?
- b. What models and scenarios would you test?
- c. What things could affect your confidence in the results of these tests?

Group 4

A catchment has been identified as vulnerable through the risk based catchment screening due to WwTW flow compliance and potential impact on bathing waters

- a. What data would you want?
- b. What models and scenarios would you test?
- c. What things could affect your confidence in the results of these tests?