

# Performance of new stormwater system at Fonterra Tirau

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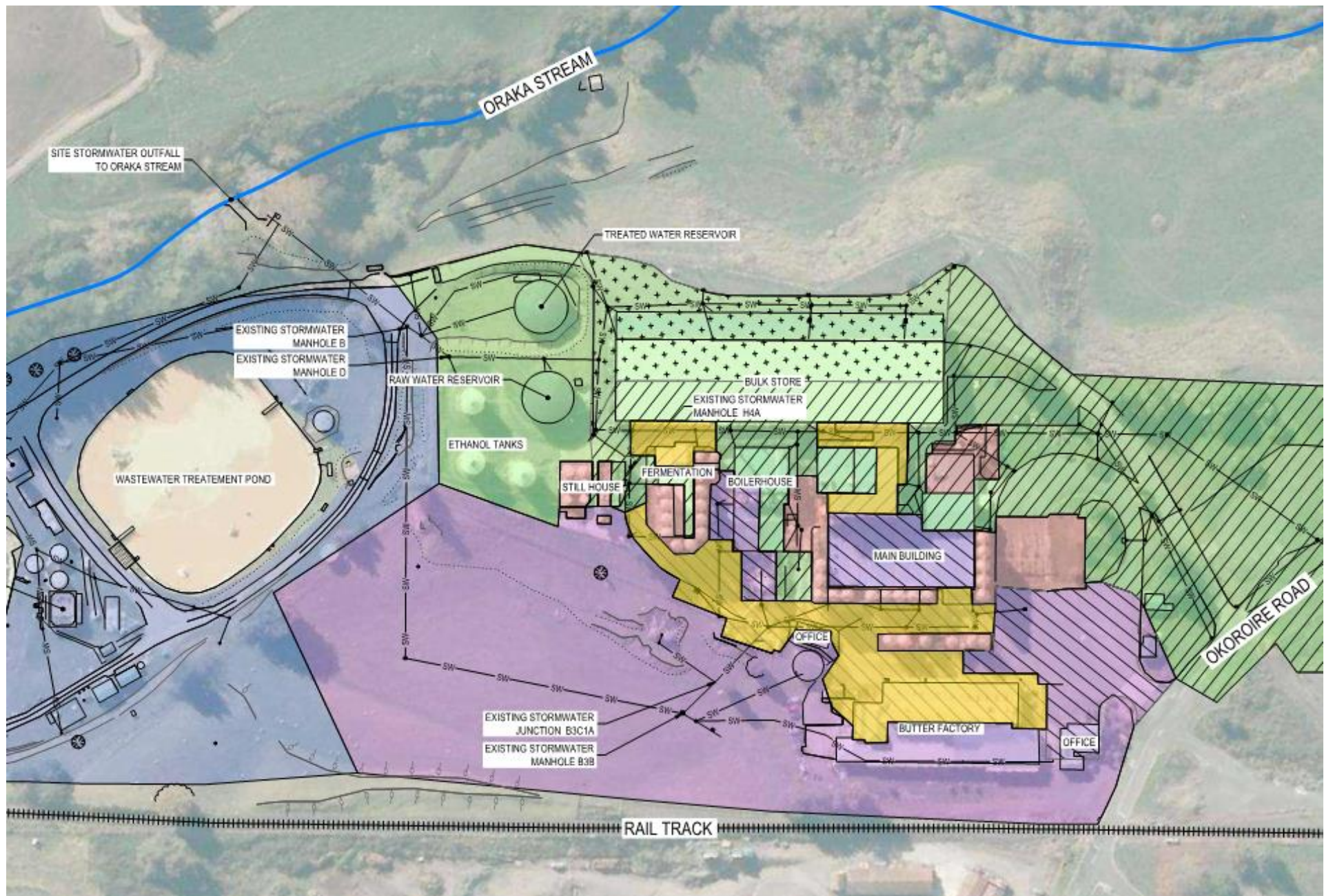
*M. PEACEY (FONTERRA) & C. MOORE (BECA)*



# Introduction

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- Fonterra's approach to stormwater design
  - Sustainability objectives
  - Risk based hierarchy
- Tirau site
  - 80 years of dairy production
  - Combined stormwater and cooling water discharge
  - Tirau township stormwater joins site discharge



# The problem

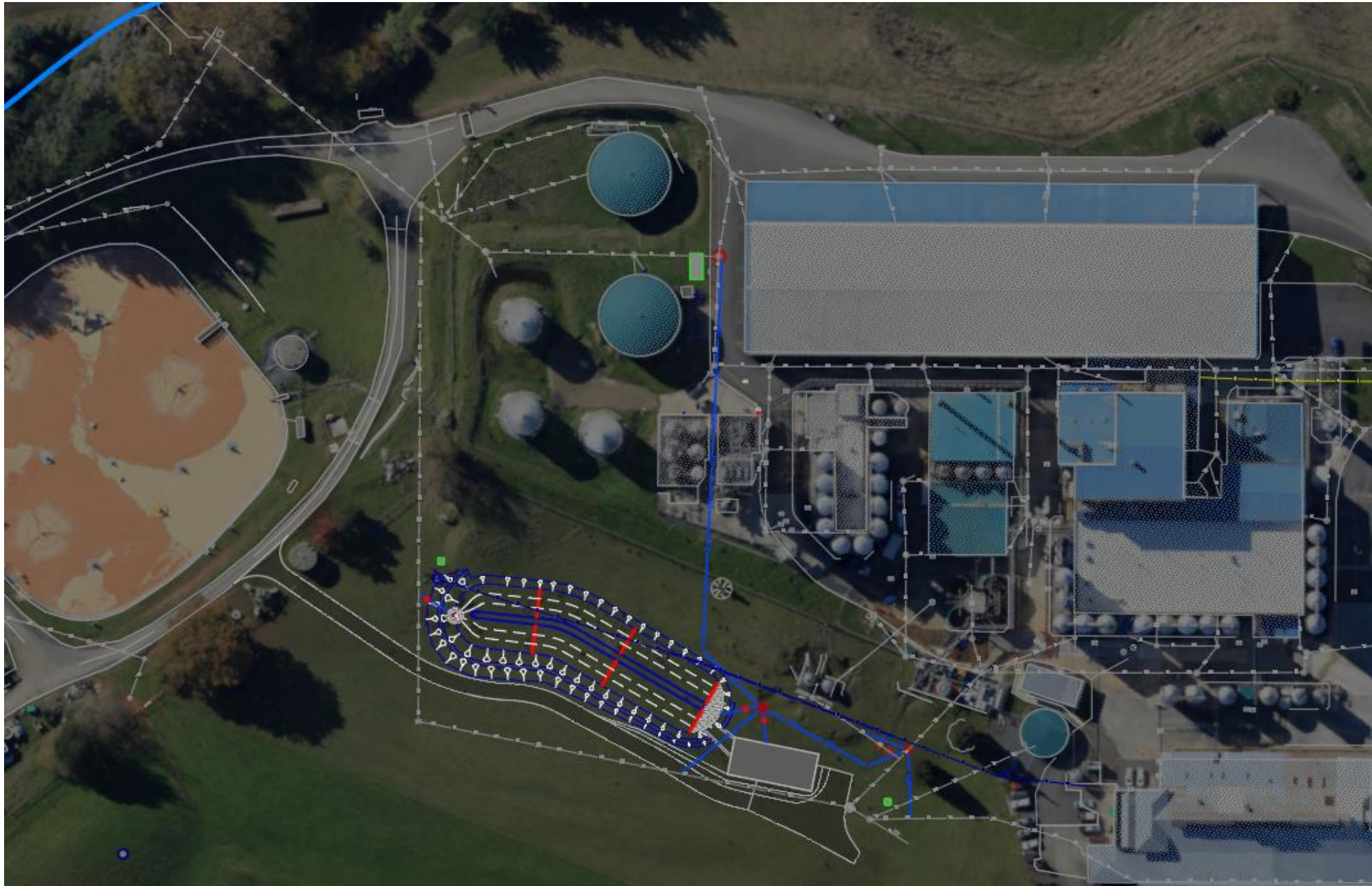
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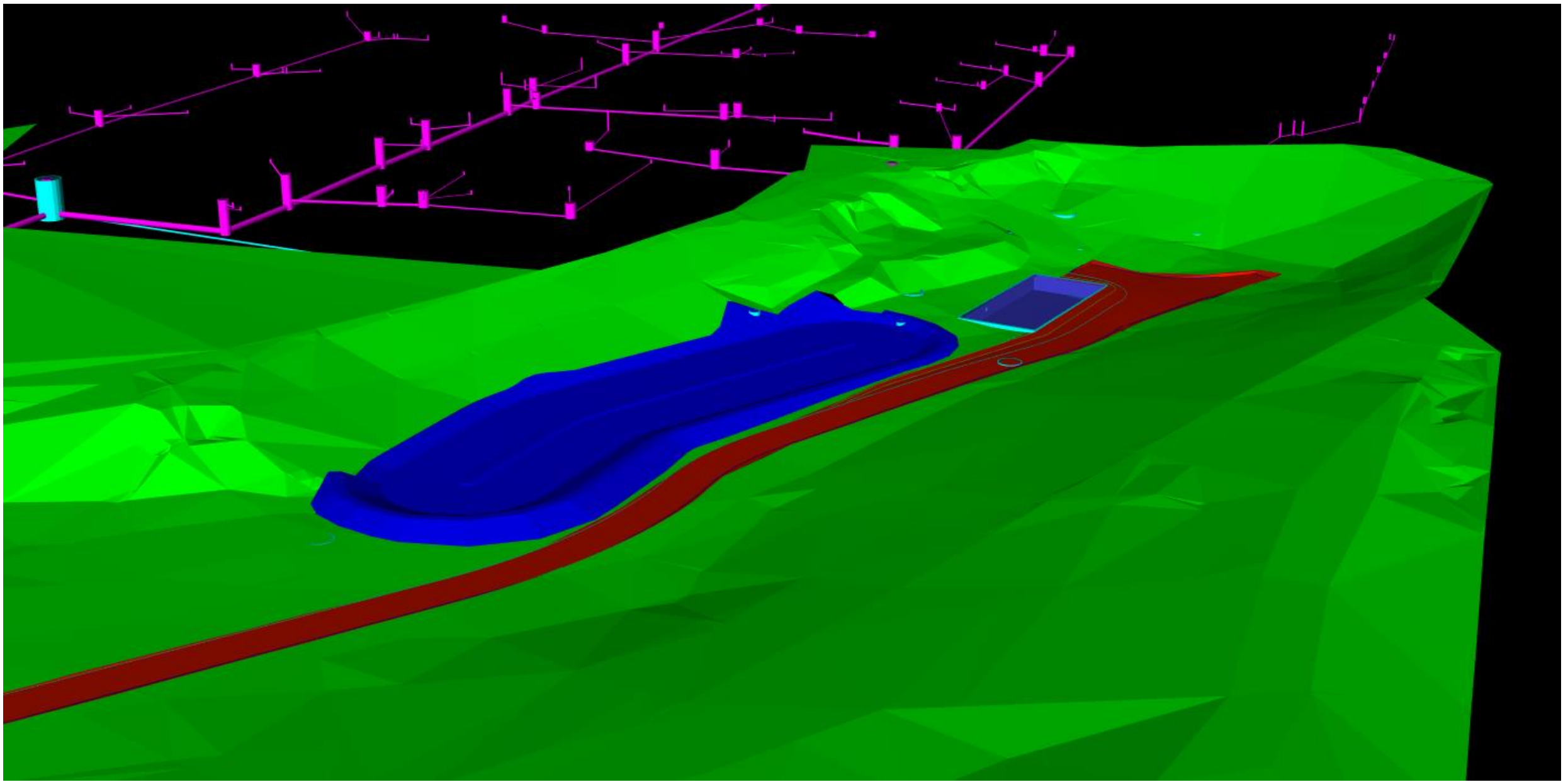
- Stormwater non compliances
  - Existing, aging stormwater system
  - Limited discharge control
  - Limited monitoring
  - Tirau township stormwater
- Resource consent renewal
  - New limits operational 1 August 2017

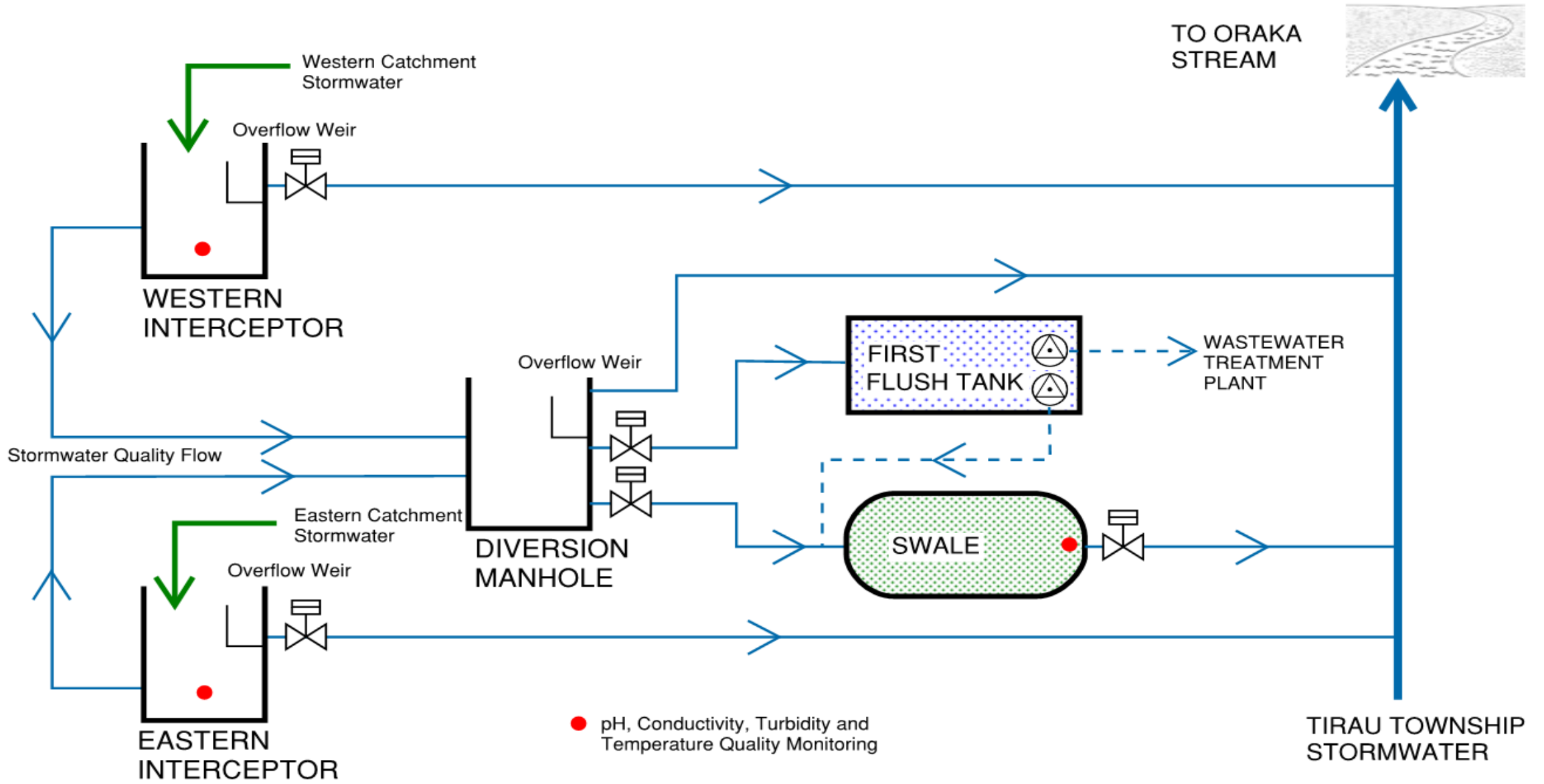
# The solution

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- New stormwater treatment system
  - Quality treatment provided
    - First flush tank
    - Swales
  - Quality monitoring and control
    - Sensors
    - Shut off valves









# First Flush Tank

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- High strength (soluble) collection & management
- Centralised spill management
- 10mm first flush
  - 350m<sup>3</sup> total; 305m<sup>3</sup> live and 45m<sup>3</sup> dead storage
- Pumping
  - Wastewater treatment plant
  - Manual pumping to swale



# Swale Treatment

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- Suspended solids treatment
- Two 65m long, 7m wide wetland swales
- Planted in native oioi
- Bunded for calamity spill containment
- Liner provided under





by CyberLink PowerDirector

# Previous Performance

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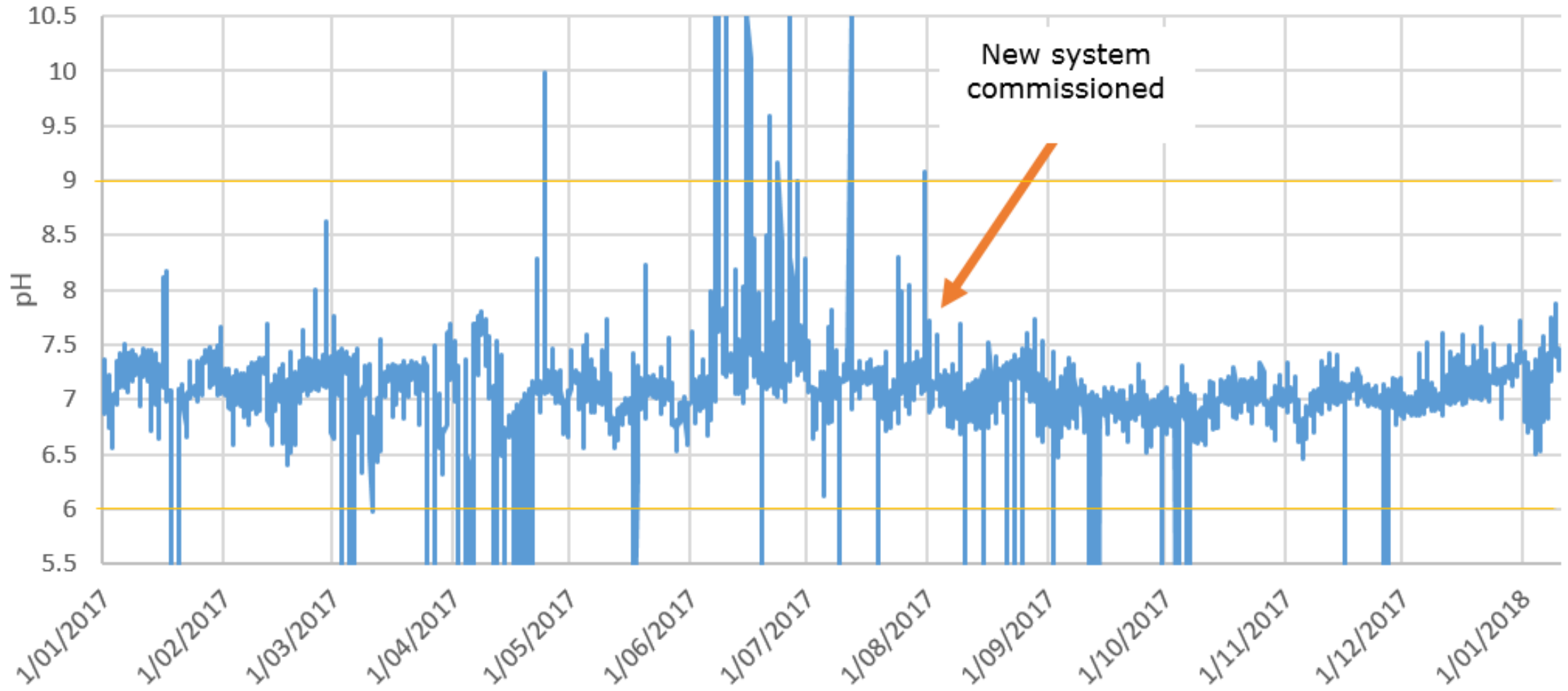
- pH, temperature and conductivity monitoring and weekly BOD grab sample
- Five non-compliances over last year
- Averages compliant with consent limits
- No isolation possible if non-complaint flows detected – High risk

# Current Performance

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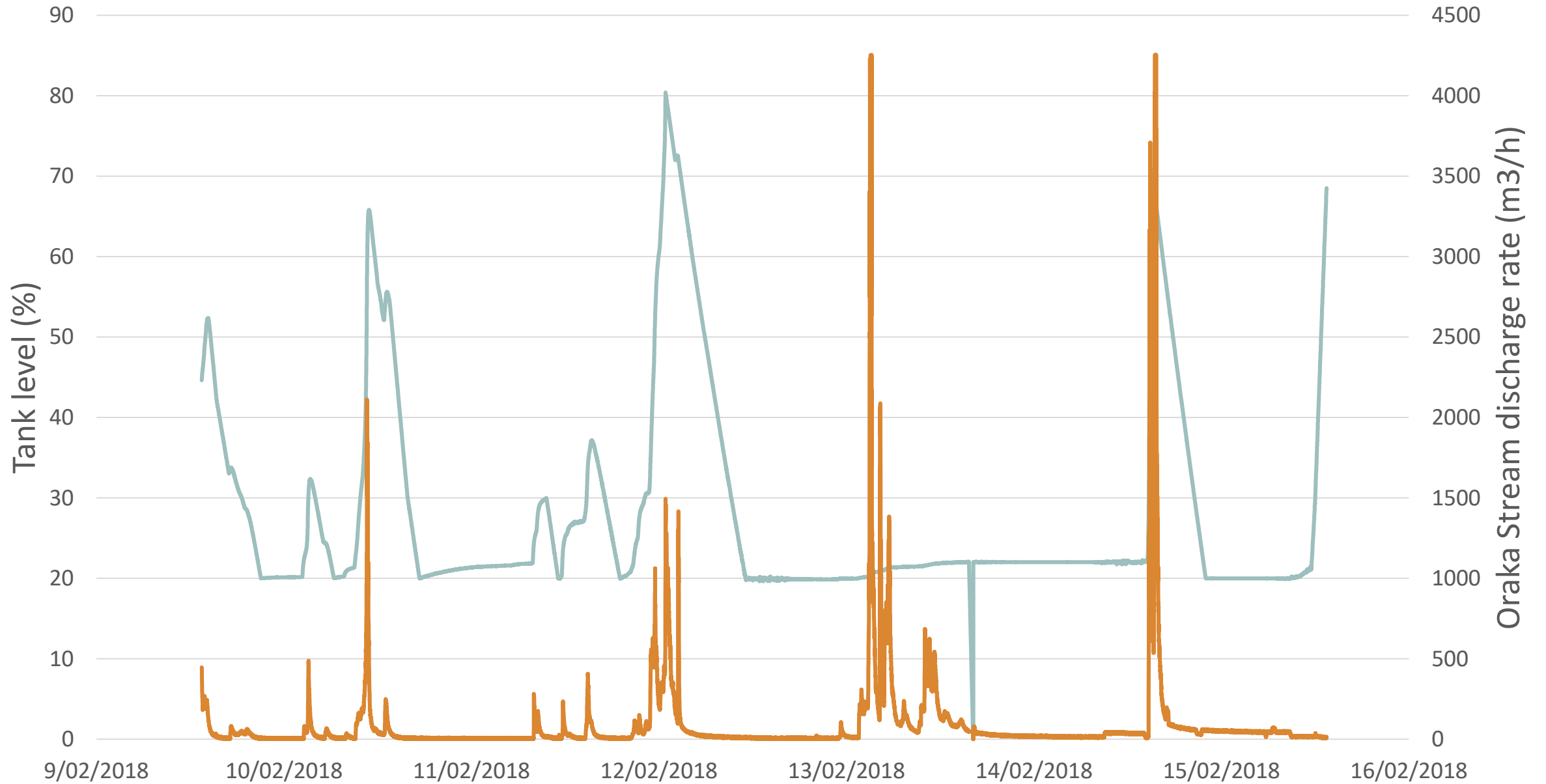
- pH, temperature, conductivity and turbidity monitoring and weekly BOD grab sample
- No non-compliances
- Turbidity and suspended solids improvement from swale
- First flush tank reducing TP, TN and COD

# Stormwater Final Discharge pH

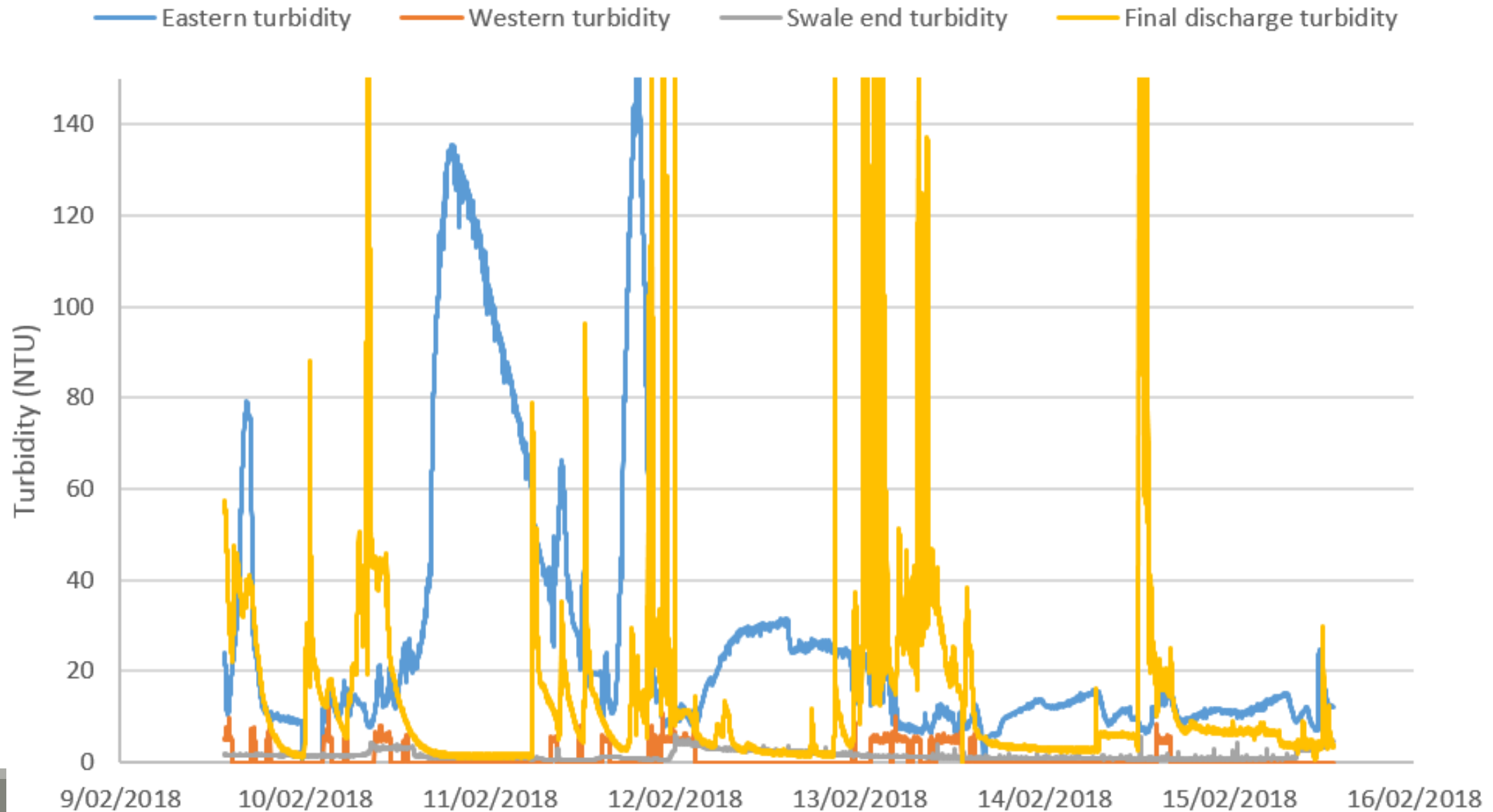




— First Flush Tank Level — Final discharge flow



# Swale Treatment



# Swale Treatment

Contaminant	Swale inlet	Swale outlet
Total suspended solids ( $\text{gm}^{-3}$ )	12	< 3
Total nitrogen ( $\text{gm}^{-3}$ )	0.42	1.12
Total phosphorus ( $\text{gm}^{-3}$ )	0.08	0.086
COD ( $\text{g O}_2 \text{m}^{-3}$ )	12	12



# Discussion

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- Cooling Water in system
- Weed growth in swale
- Volumes to wastewater treatment plant
- Town stormwater risk

# Conclusion

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- No non-complaint discharges
- Swale reducing suspended solids and turbidity
- First flush tank leading to reduction in TP, TN and COD
- Process flows within system
- First flush criteria should be reviewed regularly