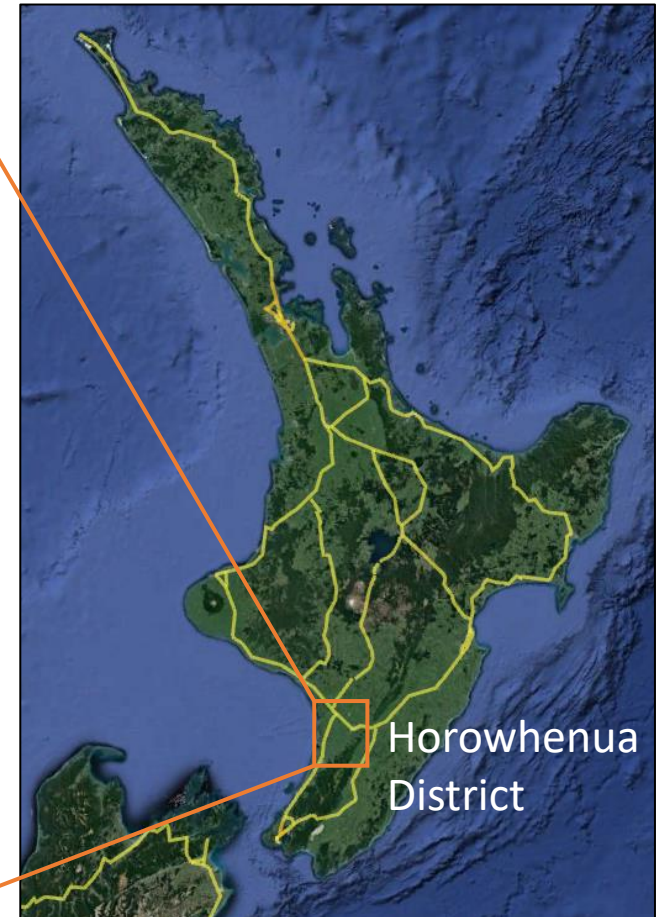
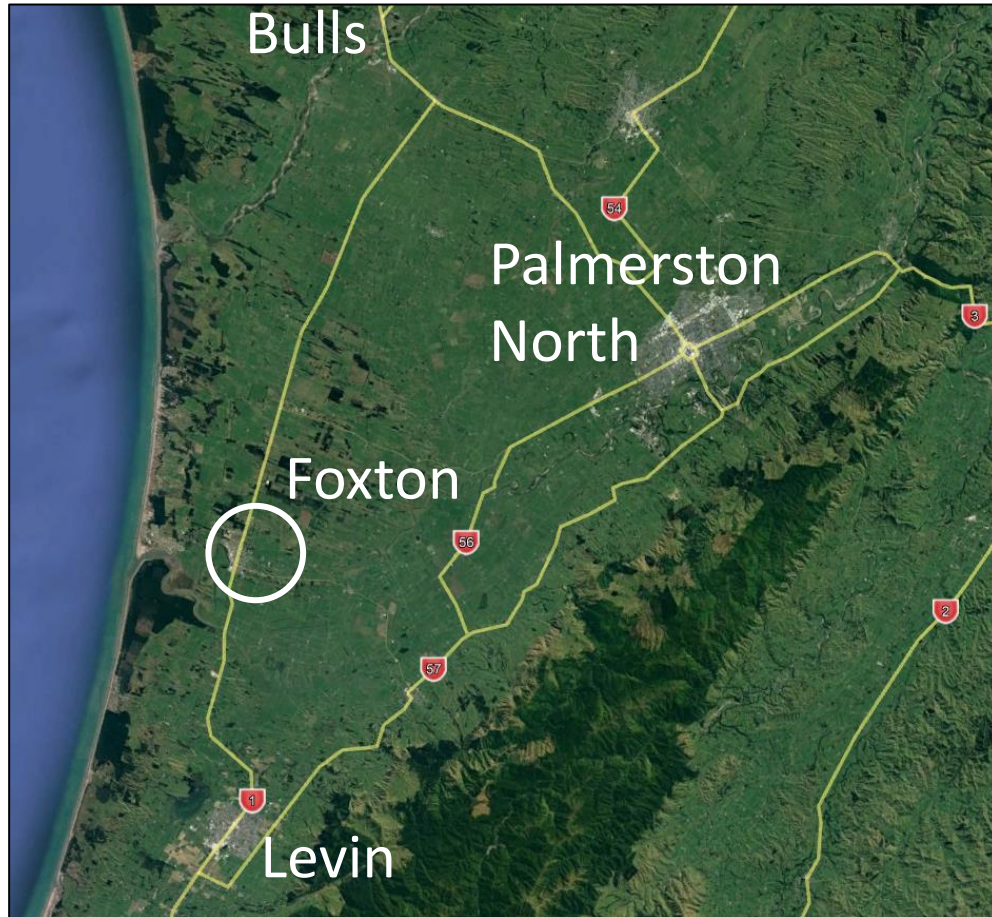


Foxton Wastewater Land Treatment

Consenting and Construction Challenges and Lessons

Phil Lake

Location



Location



Background

Foxton's Wastewater Treatment:

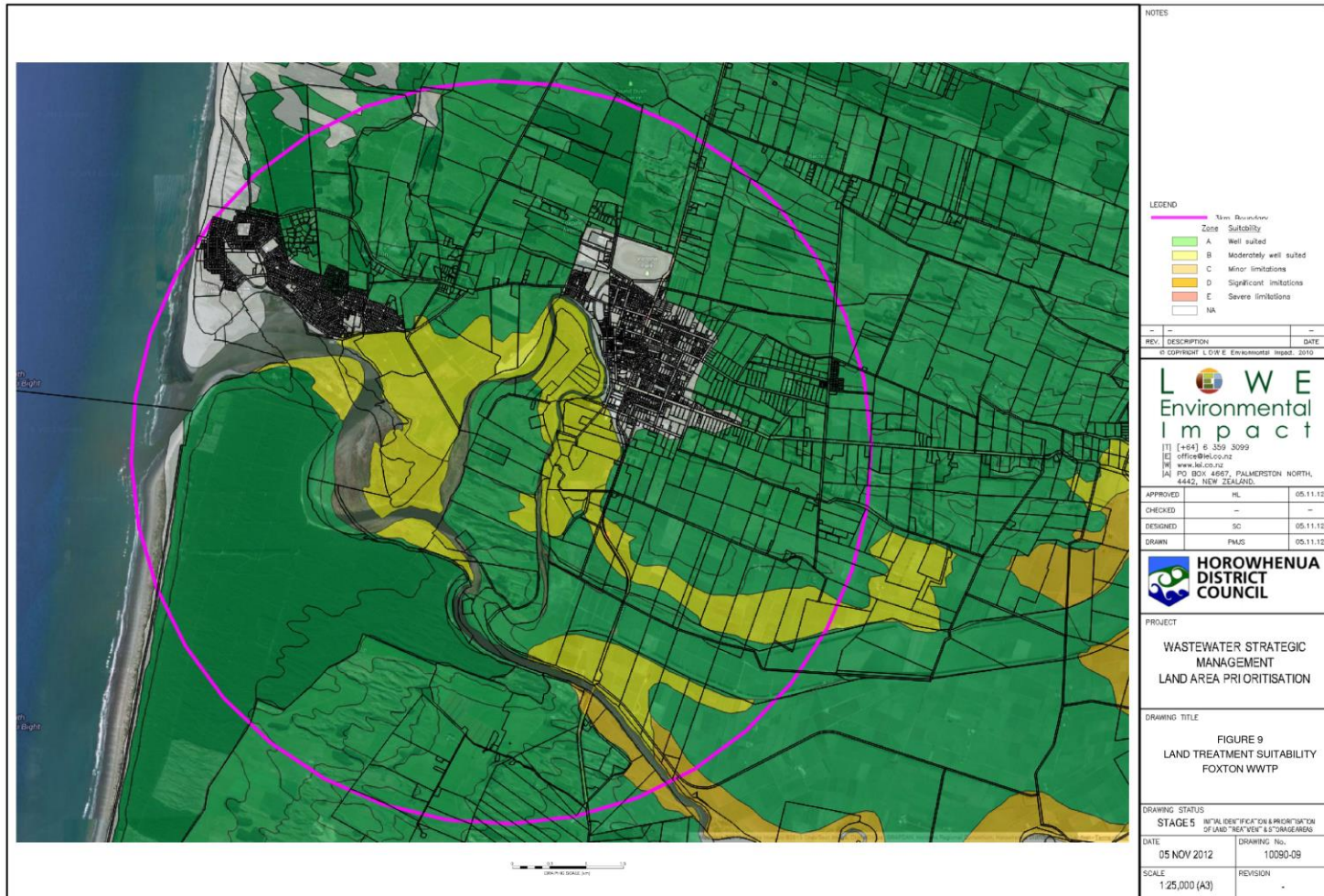
- WWTP (single pond) built at Matararapa in 1976.
- Two maturation ponds added in 1993/94.
- Continuous discharges into Foxton Loop 3 km downstream of Foxton.



Background

- Discharge Consenting – Site Selection
 - 1998 consent required HDC to seek land discharge locations for future consents.
 - 2012 district-wide land treatment suitability study by LEI
 - GIS multi-criteria broad-scale assessment of whole district.
 - Considered options of suitability within 5 km of each WWTP.
 - Considered possible central site for all district discharges.
 - Land and soil properties ranked for suitability

Background



Background

- Discharge Consenting – Site Selection
 - Focus Group consultation during 2014 included:
 - Identification of the community's core values and aspirations;
 - High level identification and consideration of 22+ locations;
 - Desk-top feasibility studies of some potential discharge sites;
 - Refinement of preferred discharge site locations and costs;
 - Consideration of land discharge regimes and design concepts.
 - Based on Focus Group outcomes and feasibility studies, Matarapa was selected as the best site in the area.

Background

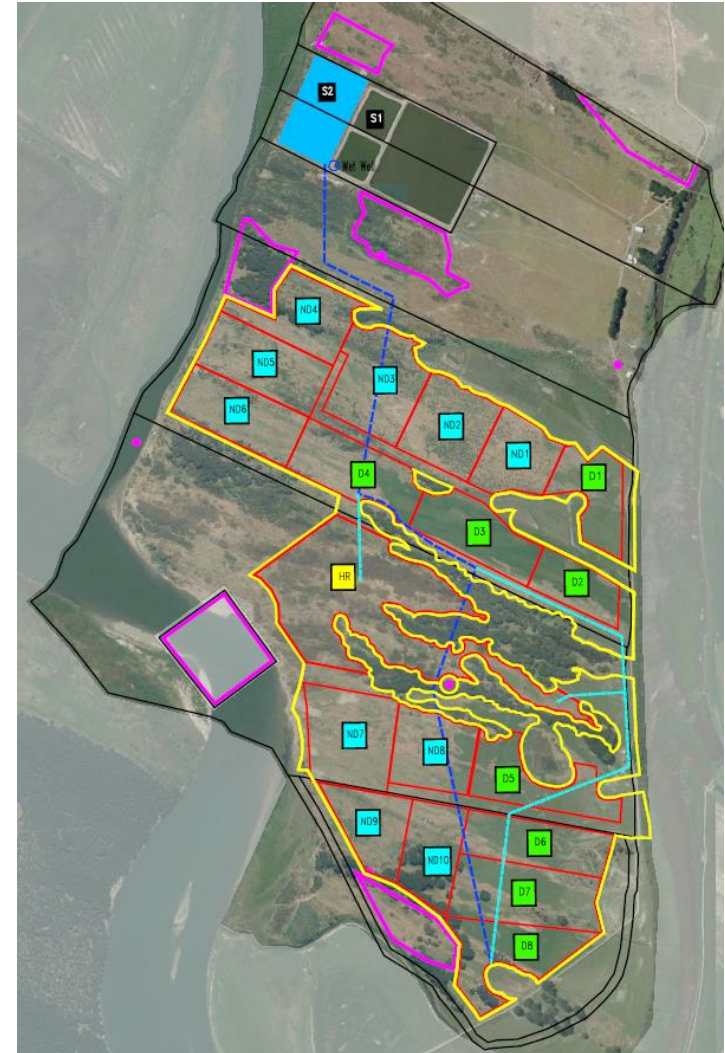


Background

- Discharge Consenting – Application Timeline
 - 2015: Detailed site investigations and conceptual design.
 - 2015: Prepared and lodged consent application.
 - 2016: Consent application publicly notified.
 - 2016-19: Environment Court processing including direct negotiations with iwi and expert conferencing.
 - February 2019: Consents granted.
 - 3 years to implement:
 - Build storage pond;
 - Install 63 ha of irrigation;
 - Cease discharges to Foxton Loop.
 - 28 years for irrigation and intensive farming (irrigated beef).

Land Treatment Overview

- Irrigation avoids all culturally sensitive areas, kanuka, wetland, and drains.
- Three irrigation management units have application rates that reflect different soils and terrain.
- Build 50,000 m³ of storage.
- Continue existing bull farming operation.



Consenting Challenges

- District Plan constraints:
 - District Plan maps of flood hazard are incorrect but rules restricting structures and earthworks still applied.
 - Entire site is Outstanding Natural Landscape.



- Unable to modify terrain from original contours;
- All irrigation posts needed to be under 3 m high;
- Considered visual effects of fenceposts and irrigation posts;
- Considered visual effects of greening of pasture from irrigation;
- No rules specific to kanuka but trees needed to be protected.

Consenting Challenges

- One Plan conflicts:
 - Wastewater discharges to land strongly encouraged but:
 - Nitrogen losses are tightly restricted by Table 14.2;
 - Irrigation of beef farms meets definition of intensive farming;
 - New intensive farms are difficult to consent due to conflicting rules and policies regarding nitrogen loss limits;
 - Irrigating areas of kanuka is a non-complying activity;
 - Existing pond seepage to groundwater requires consent;
 - Tension between increased contamination of groundwater and reduced contamination of surface water.

Consenting Challenges

- Overseer modelling:
 - Overseer model version updates increased predictions of nitrogen losses well beyond Table 14.2 limits.
 - One Plan and Table 14.2 had no mechanism for adjusting when Overseer updates changed its predicted losses for the same scenarios.
 - Conflict between principles of Overseer and its use as a regulatory and annual compliance tool.

Consenting Lessons

- Test case for application of One Plan rules and policies for new intensive farms and wastewater irrigation.
- Good things take time. Lots of patience and \$\$ too!
- Good consent outcomes rely on:
 - Thorough pre-application consultation/engagement;
 - Robust site investigations and technical documentation;
 - Robust design and technical backing;
 - Strong, unified team of experts;
 - Resolving opposition and concerns raised by iwi, submitters, and Council experts.

Construction Challenges

- Management of:
 - Uninterrupted wastewater treatment and farming;
 - Integrated design and operation;
 - Complex and fluid project team;
 - Iwi liaison and monitoring;
 - Materials supplies;
 - Timelines;
 - Costs.



Construction Lessons

- Invest time to:
 - Integrate design and operation;
 - Obtain different perspectives and expertise;
 - Explain reasons for decisions;
 - Gain common understanding;
 - Avoid conflicts;
 - Solve problems.



Simple win-win solutions are usually possible but may require several iterations of designs or discussions.

Construction Lessons

- Management of detail helps avoid cost escalation and delays (even without COVID disruptions)
- Smooth sailing is a bonus!



Completed Works

Pump shed



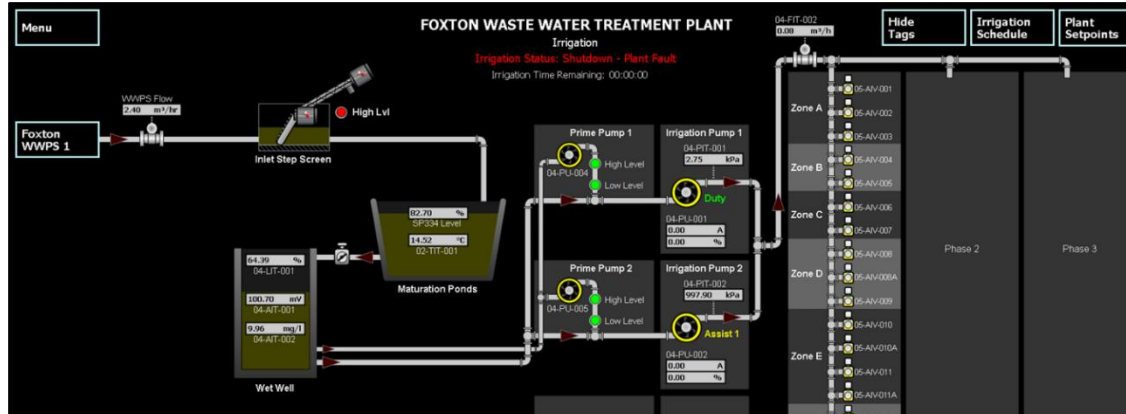
Wet well



Pumps



Computer Controls



Weather Station

Wind Speed: 4.20 m/s
Wind Inhibit Period: 10 min
Wind Reset Period: 20 min
Rainfall Last Hour: 0.04 mm
Outside Temperature 1.5m: 12.80 °C
Outside Temperature 6.0m: 12.42 °C
Humidity: 93.98 %
Solar Radiation: 168.45 W/m²

Wind Direction: 208.56

05/09/20 11:54:12 INFO INFO ACK FOXTON_WWTP_MISC_AL_Plant_Shutdown
05/09/20 11:54:12 INFO INFO ACK FOXTON_WWTP_MISC_AL_Convert_Shutdown
05/09/20 11:54:12 INFO INFO ACK FOXTON_WWTP_MISC_AL_PumpRunpump_Unavailable

Menu

FOXTON WASTE WATER TREATMENT PLANT

Phase 1 Irrigation Area

Irrigation Status: Running
Irrigation Time Remaining: 00:00:40

Hide Paddocks

Irrigation Schedule

Plant Setpoints

Paddocks

Service

Fertiliser

Phase 1 Moisture Probes

MU1 Inside Irrigation: 1 17.25 mm
MU1 Outside Reference: 2 17.05 mm
MU2 Inside Irrigation: 3 18.52 mm
MU2 Outside Reference: 4 18.94 mm

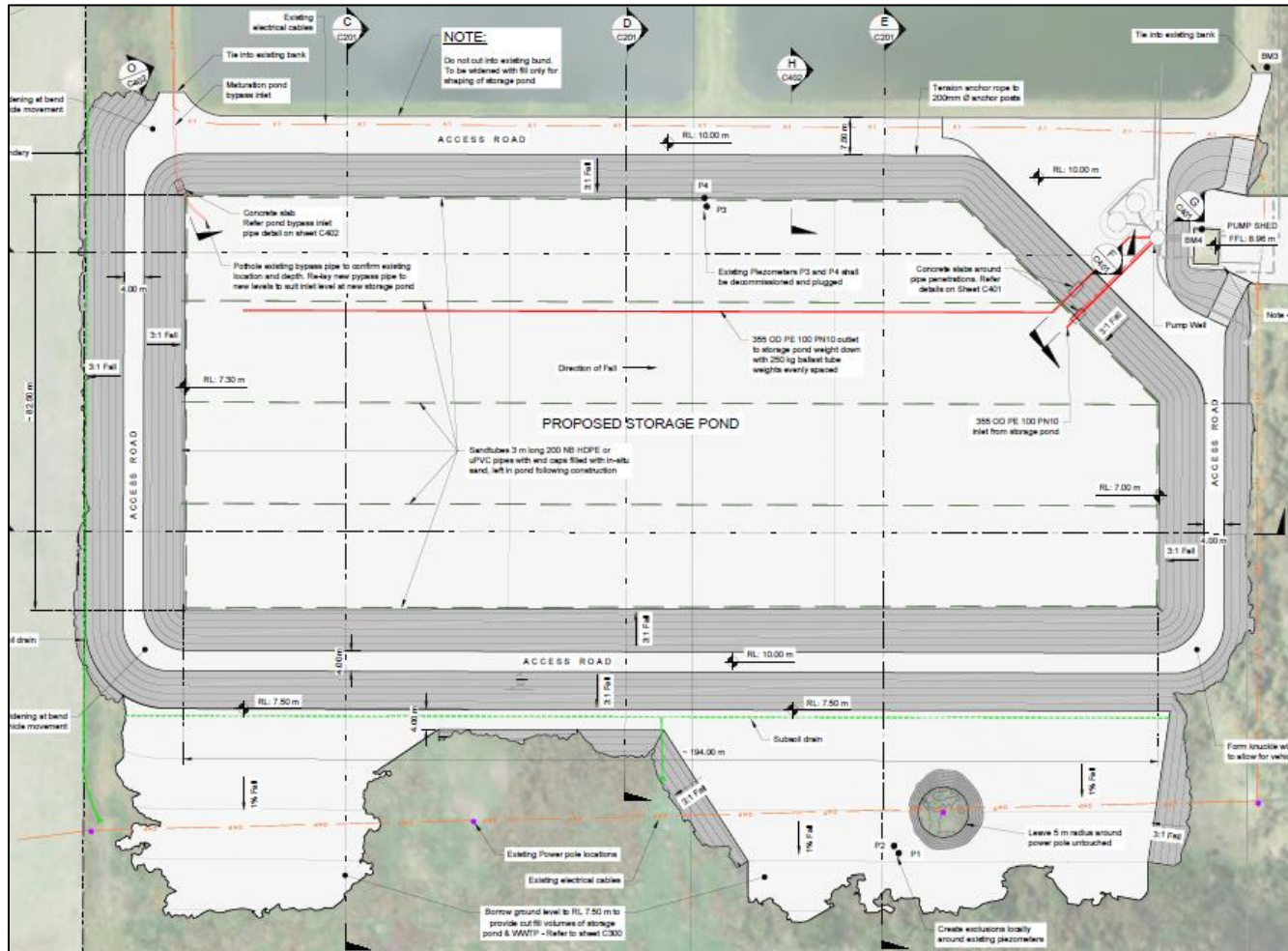
#	Depth	MU	Schedule Time	Zone	Block Value
1.	5.0 mm	2	Friday, 9 October, 11:25 Runtime: 01:00	C	05-AV-007
			Friday, 9 October, 12:25	-	-
2.	15.0 mm	2	Friday, 9 October, 12:25 Runtime: 04:03	D	05-AV-009
			Friday, 9 October, 16:29	-	-

MU & Irrigation Block Legend

Defect Irrigation: MU 1 ☐ Out of Service ☐
Non-Defect Irrigation: MU 2 ☐ Unavailable ☐
High Rate Discharge: MU 3 ☐ Active ☐
Paused ☐
Currently Scheduled ☐
Selected for New Schedule ☐

Fault Reset

New Storage Pond



New Storage Pond



Future Irrigation Areas



LOWE Environmental Impact

Advice AEE Agricultural Analysis Application Approachable Assessments Assimilation Assistance **Biosolids** Capability Client Communications Communities Compliance
Compost **Consents** Consultation Contamination Coordinate Council Cultural Current Data Degradation **Design** Detention Developments
Discharges Documentation Drafting E. coli Ecosystems Effects Engagement Environment Equipment Evidence Excellence Experienced Expert Facilitating Farming Feasibility
Fieldwork First-flush Fit-for-purpose Flooding Fun Geology Graphs Greywater Groundwater Guidelines Handbag Hazardous Hydraulics Innovation Interpretation Investigation
Irrigation Land Landfills Landscape Land-treatment Leaching Lodge **Management** Metals Microbiology **Modelling** Monitoring
NES **Nitrogen** **Nutrients** Onsite Optimisation Organics Overseer Papers Pathogens Phosphorus Plain-english **Plans** Preparation Presentations
Project Quality Relevant Remediation Reports Research Review **Sampling** Scientific Septage Sludge **Soil** Solutions Spreadsheets Standpipes Stormwater Strategy
Support Surface Water Sustainability Systems Team Testing Timely **Treatment** Validation **Wastewater** Water Water-balance Waterways