

Lake Coleridge – 20 Years On

Brian Ellwood – Lowe Environmental Impact



• Lake Coleridge Village Treatment System Overview

• Treatment Quality

• Proposed Maintenance and Remediation

Introduction



- Lake Coleridge New Zealand's first hydroelectric scheme
 - Construction began in 1911, commissioned in 1914
- Wastewater treatment plant first installed in 1965. Consisted of an Imhoff tank, discharged to the power station tailrace
- Treatment plant upgraded in 2004, discharge to tailrace no longer required



Wastewater Treatment Plant





Wastewater Treatment Site Layout





Subsurface Wetland

- Submerged vegetated bed wetland: 31m long, 16m wide
- Surface area: 500m²
- Working depth: 0.55m
- Design flow: 41 m3/day
- Hydraulic retention time: approx. 2 days
- Planted with: Carex Secta & Carex Virgata
- Achieving: low BOD, SS and nitrate
- Low maintenance





Wastewater Quality Prior to Overland Flow



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Receiving Environment Water Quality



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Faecal Coliform Data





Maintenance Needed



- Water quality outcomes have consistency been achieved,
- However not all consent conditions were being met
- Overland flow area degraded:
 - Water unevenly distributed
 - Channelling of flow across overland flow area
 - Ponding of water

Overland Flow Area – Pre-Upgrade







Overland Flow Area – Pre-Upgrade











• Field vegetation removal and releveling



Field inlet

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• Upgrade inlet manifold





Denitrification Trench Testing





- Existing denitrification trench: sawdust/gravel blend
- Some sawdust still visible, similar to topsoil in Carbon and Nitrogen levels
- Lab analysis showed:
 - C:N ratio range: 15:1 to 22:1
 - High levels of potentially available nitrogen equivalent to 200 kg/N/ha

Field and Trench Remediation





Current Status









- After 20 years, the Lake Coleridge wastewater treatment plant continues to operate effectively
- Providing sustainable treatment of wastewater for this small community
- Remains cost-effective and appropriate for the receiving environment

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Advice AEE Agricultural Analysis Application Approachable Assessments Assimilation Assistance Biosolids Capability Client Communications Communities Compliance
Compost Consultation Contamination Coordinate Council Cultural Current Data Degradation Design Detention Developments
Discharges Documentation Drafting E. coli Ecosystems Effects Engagement Environment Equipment Evidence Exœllenœ Experienœd 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 Solutions Spreadsheets Standpipes Stormwater Strategy
Support Surface Water Sustainability Systems Team Testing Timely Treatment Validation Wastewater Water Water-balance Waterways

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