

CCC CWTP Fire Adaptive Recovery Action Plan - Version 1

1 Background

The fire of 1 November 2021 started on the roof of one of the trickling filters and quickly spread to the second trickling filter where it continued to burn until 25 November, when Fire and Emergency New Zealand (FENZ) deemed the fire extinguished.

Damage immediately visible following the fire indicated:

- Roofs destroyed and filter media damaged
- Mechanical equipment including effluent distributor arms and odour control pipework damaged
- Further assessment required to determine the extent of structural damage to the reinforced concrete housing structure.

The trickling filters were a key component of the secondary treatment process at the Christchurch Wastewater Treatment Plant (CWTP), responsible for removing around 60% of the organic matter through the treatment process. The trickling filters are covered media filled structures with distribution arms, air handling and drainage systems. Supernatant wastewater from the primary sedimentation tanks was pumped to the top of the structures and trickled through the media where biofilm on the media consumes nutrients. Air was pumped up from the bottom, to maintain aerobic conditions, and then withdrawn to be passed through biofilters to mitigate the odour.

The trickling filters have been isolated since the fire. This has imposed significantly higher organic loads onto the downstream treatment processes particularly the oxidation ponds. The plant has implemented an interim recovery plan that comprises polymer dosing to improve the efficiency of sedimentation tanks, the conversion of two clarifiers to suspended growth aeration basins, hydrogen peroxide dosing to the oxidation ponds and increased mechanical aeration of the oxidation ponds. This plan will improve wastewater treatment effectiveness and allow the plant to operate within its consent conditions while Council consider the long-term solution for the plant. The interim recovery plan process will have a lower capacity, higher operating costs, and higher operating risks than the treatment plant operation prior to the fire.

Council is investigating the long-term solution for the plant. The long-term solution will depend on the findings of the damage assessment, the outcome of insurance negotiations (funding to repair or rebuild), or whether another secondary treatment process should be implemented that provides for the long-term treatment needs of the plant while allowing a reduction of greenhouse gas emissions from the plant.

2 CCC Objectives

The key objectives, which are driving the overall response and the workstreams underway, are:

- Recover Treatment Capacity – Interim operational changes to the plant to increase treatment capacity and improve treatment performance to maintain healthy oxidation ponds and discharge wastewater effluent within consent requirements.

- Mitigate the effects on the Community - Local residents are impacted by the ongoing odour from the treatment plant and measures are required to support community wellbeing.
- Mitigate the effects on the Environment – The impact on the environment including immediate impacts of sewage discharge into the ponds located in a wildlife reserve includes working with tangata whenua to identify ways to reduce any detrimental effects
- Finalise Insurance Claim – Seeking to maximise recovery within a reasonable timeframe to provide funding for future repair or rebuild works.
- Plan for the future – Repair, rebuild or take opportunity to adopt new technology whilst allowing for population growth and greenhouse gas emission reduction.

3 Current Workstreams

Workstream	Projects	Status	Timeframe
Emergency Response	Trickling Filter removal from treatment process	Complete.	Complete
	Improve solids removal	Polymer dosing of primary sedimentation tanks completed in November and continued through to May. Additional sedimentation tanks now operating and polymer dosing on stand-by.	Ongoing, dosing requirements reviewed regularly as interim solution implemented
	Maintain dissolved oxygen in the oxidation ponds	Peroxide dosing of wastewater entering the ponds established in November and ongoing.	
Insurance	Visual and Structural Assessment including concrete testing	Visual inspection by insurer and Council consultants complete. Structural assessment by Council consultants ongoing pending results of concrete testing. Testing of cores underway in the UK.	Complete apart from specialist lab testing
	Repair and Rebuild Cost Estimates	Initial cost estimates completed.	Complete
	Negotiate Settlement	Insurance claim lodged and accepted, interim payment of \$10m received	Ongoing

		Expenditure to date under review to determine timing of further payments from insurers	
Health, Safety and Environment	Fire Investigation Report	Cause and Origin Report ongoing by External Investigators and Insurer.	Ongoing
	Health and Safety Management Plans, Inductions, and Inspections		Initial planning complete, inspections and audits ongoing
	Environmental Monitoring	Air sampling is underway, working alongside Community and Public Health (a division of the Canterbury District Health Board) and Environment Canterbury, with weekly update meetings. Six-week programme to identify gases contributing to the odour with sampling data shared with stakeholders and published on Council's website.	Grab sampling underway and continuous monitoring sites being established
		Hydrogen sulphide identified as key indicator and up to six 24/7 monitoring stations to be implemented around the plant and neighbouring residential area. Additional monitoring to respond to incidents and reports of odour using mobile meters.	
		External odour, air quality and noise specialists engaged by Council to provide independent sampling, analysis, and reporting.	
		Noise monitoring programme underway to check levels from chipping and compaction of filter media.	
Community Response Recovery Plan	Community Support Package	As of 7 June, community support packages have been distributed to approximately 40% of the 3,380 eligible in zone residents and 48 out of zone (on medical grounds) working with Nga Hau E Wha, He Waka Tapu, The Loft, and the Bromley Community Centre.	Ongoing
	Community Wellbeing and	Workshop updating progress at the treatment plant planned for late June.	

	Support Workshops	Public Meetings	
Interim Recovery Plan	Communications and Engagement	<p>Communication and Engagement Plans in place to support both the operational response and the community response recovery plan, with a focus on frequent updates across multiple channels.</p> <p>Joint communications plan developed with Transwaste, Hurunui and Waimakariri District Councils in relation to the carting and disposal of trickling filter media at Kate Valley Landfill.</p>	Complete
	Trickling Filter Bypass	Piped bypass of trickling filters in progress.	Interim recovery plan implemented by late June 2022
	Aeration basins	New aerators are operational in two of the clarifiers, converting them into aeration basins. Pumps to recirculate the sludge to be installed by mid-June to improve treatment effectiveness.	
	Odour management for oxidation ponds	Effluent discharged to the ponds is being dosed with hydrogen peroxide. Two mechanical aerators on pond 1 and further aerators to be installed.	
	Trickling Filter Media Removal	Contractor engaged and work commenced 12 May with a programme duration of four months (7 September).	Media removal completed by early September 2022
Long Term Recovery	Trickling Filter Replacement Options Study	Consultants engaged to deliver a report outlining future options for replacement of the trickling filters, with a focus on modern technology, future population growth and a reduction in greenhouse gas emissions.	Options assessment completed late 2022

4 Programme and Next Steps

The draft timeline below outlines the activities remaining for 2022. Key focus areas are around ongoing community support, Health, Safety and Environmental response, treatment process recovery, trickling filter material removal, and the long-term Tricking Filter Options Study.

