

# Earthquake Repairs at Christchurch Wastewater Treatment Plant (CWTP) – Clarifying the Situation

Ian Billings, Greg Offer and Tim Scott (New Zealand)

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## SUMMARY

Christchurch wastewater treatment plant has four large secondary clarifiers that separate solids from the mixed liquor in the final stages of treatment. The 6.3M earthquake on 22nd February 2011 caused major damage at the site and rendered all four clarifiers unserviceable. Without clarifiers in operation the plant was forced to discharge bio-trickling filter-treated sewage to the oxidation ponds for an extended period. This paper outlines the investigations of earthquake damage, the strategy for “quick fix” repairs to restore plant function, and decisions on permanent repair priorities and methods. Without the clarifiers in operation the city of Christchurch was exposed to environmental and health risks from the discharge. This created urgency to implement temporary repair on at least two clarifiers. The paper describes how a temporary “quick fix” was successfully implemented within 4 months to restore basic plant function. More difficult and complex issues were faced with the permanent repairs. The paper describes the varying levels of damage discovered, the method for selecting repair options, and the relative performance of each option. The paper also describes some technical highlights, including the success and failure of various diagnostic tools, and the use of very large bore (1.8m diameter) liners for pipe repairs.