

International Project in Auckland, New Zealand



Client: Manakau Wastewater Services

Location: Auckland, New Zealand

Site Issue: Dredging of biomass and sediment from sewage treatment impoundments constructed in the Pacific Ocean.

Solution: Provide specialized testing and consulting services, to help develop a cost-effective plan for the dredging and dewatering of the biomass.



Brief History

The city of Auckland, New Zealand uses four 200 acre impoundments in the tidal ocean area for secondary treatment of sewage. During 30 years of operation of the impoundments, approximately 2,000,000 m³ of dead algae accumulated in the impoundments. About 1990, Water Care, the operator of the sewage treatment plant decided to modernize the water treatment plant. Part of the planned modernization included the construction of an on-shore secondary treatment system and the decommissioning of the impoundments. The decommissioning is complicated by the accumulation of heavy metals and other substances in the biomass.

HE&C was retained during the bidding process, to assist in preparation of the bidding documents for the dredging of the impoundments and to provide an analysis of the bids submitted. The successful bidder, Manukau Wastewater Services (MWS), retained HE&C to perform bench scale tests on a mixture of biomass and sediment and time rate consolidation characteristics of the mixture. Based on the results of the testing, HE&C provided MWS with recommendations for handling and dewatering of the mixture. MWS completed the project in 2001 removing 3,200,000 cubic meters of 8% dry solids organic sediment, dewatering the sediment to 21% dry solids using a centrifuge and placing the solids in an 80-acre in-water landfill cell.

Major Activities Performed by HEC Personnel

- Prepared bidding documents for the dredging of approximately 2,000,000 m³ of sediment and biomass from impoundments in the Pacific Ocean.
- Developed an innovative test method, using a seepage consolidometer, to determine the consolidation properties of the dredged material in the dewatering lagoon.
- Developed a computer model to interpret the data from the seepage consolidation test and to estimate the self weight consolidation behavior of the sediment in the dewatering lagoon.
- Provided the client with recommendations for performing bench scale settling tests using 8-inch diameter x 6-feet high columns.