

# Genifuel Not Waste

The objective of the proposed project is to design, build, and operate a Hydrothermal Processing (HTP) system to recover the energy in wastewater solids as renewable oil and natural gas at an operating water resource recovery facility (WRRF). The HTP process has already been demonstrated at smaller scales, but a system running continuously in an industrial environment is needed to support widespread deployment of this energy recovery technology. HTP technology addresses critical problems in wastewater solids (sludge) management, while providing specific advantages not available with competing technologies. As a result, the process has attracted intense interest from the wastewater industry.

The proposed project will be located at the Anacortes Wastewater Treatment Plant in the City of Anacortes, Washington. This plant serves a population of approximately 17,000 people with an average daily flow of 1.89 million gallons. The proposed system would recover >90% of the carbon in the sludge stream to produce ~3 barrels of 100% renewable biocrude per day for subsequent downstream conversion into drop-in fuels, and a gas product which can be either used as-is or upgraded for direct injection into a natural gas pipeline for use in transportation.

The project offers significant potential to truly realize the goal of recovering the resources in wastewater. Nationally, 15,000 WRRFs produce over 12 million metric tons (dry weight) of solids annually. Recovering the energy in these solids via HTP into renewable biocrude will produce the equivalent of 41 million barrels of oil per year and save \$3 billion in wastewater solids disposal costs. These disposal costs can be 50% to 60% of a wastewater utility's total operating cost, resulting in a significant economic benefit to utilities and their customers, particularly budget-constrained small and medium-sized facilities.

The Genifuel HTP process overhauls the traditional principles of solids management furthering the transition to resource recovery at a WRRF. A reliable technology that transforms a cost and environmental burden (sludge) into revenue generating renewable fuels would revolutionize solids management at WRRF's throughout the world. The communities serviced by small and medium sized WRRF stand to critically benefit from this shift to resource recovery, generating needed fuel resources where they are used from an otherwise wasted product.

The uncertainty and inevitability of future regulations challenges small and medium-sized WRRF's. The primary benefit to the WRRF of using HTP is the nearly complete elimination of wastewater solids—turning this escalating cost into revenue. HTP technology can be applied at various stages in the treatment process, including for primary sludge, secondary sludge, post-digester biosolids, or any combination of these. This provides wide flexibility for integration of HTP into existing operations, ranging from complete treatment of raw sludges to elimination of post-digester biosolids.

The basic premise of Water Resource Recovery Facility is no longer viewing any output as waste. The Genifuel HTP process more fully captures the value of sludge.