

TROJAN UV CASE STUDIES

Municipal Wastewater

Photo credit: Travis Thurston

TrojanUV Solutions: Reuse with TrojanUVSigna™



UV Disinfection Upgrade for Water Reuse in **EWA BEACH**, Hawaii

PROJECT BACKGROUND

Ewa Beach, located on the Island of O'ahu in Hawaii, is home to the Honouliuli Wastewater Treatment Plant (WWTP), the regional wastewater treatment facility for the 'Ewa district. The Honouliuli WWTP service area encompasses 76,000 acres of land and provides water for the Ewa District, as well as for the industrial customers in the area.

Originally put into service in 1984, the Honouliuli WWTP provides conventional primary treatment, solids treatment & handling and odor control for the region. Treated wastewater was discharged into West Mamala Bay through a deep ocean outfall.

In an agreement with the Environmental Protection Agency (EPA), the city was required to improve the wastewater system and develop an effluent reuse system. In the summer of 2000, construction was completed on a 12 MGD water recycling facility (WRF) to recycle

highly-treated wastewater. The Honouliuli WRF included filtration and UV disinfection with the TrojanUV4000™ to treat to Class R-1 reuse standards for various uses such as irrigation. The TrojanUV4000 used 256 medium-pressure UV lamps to disinfect the filtered effluent (including redundancy).

THE TROJANUV SOLUTION

The Honouliuli WRF is owned by the Honolulu Board of Water Supply (BWS), and operated by Veolia. Both the BWS and Veolia are advocates of UV disinfection and have supported the technology's use for reuse. In order to maintain high-level reuse at the WRF while reducing operation costs, in 2015, the BWS and Veolia began proactively seeking a replacement for the 15 year old TrojanUV4000.

The TrojanUVSigna™ was selected to replace the TrojanUV4000 in order to take advantage of the high-efficiency low-pressure high-output

(LPHO) lamp technology which reduces both electrical consumption and power costs. The TrojanUVSigna has received independent bioassay validation per industry protocols (NWRI 2012, UVDGM) demonstrating its effectiveness for high-level reuse.

Other key factors in the selection process included:

- Simple installation into a new UV channel
- TrojanUV Solo Lamp™ Technology, which demonstrated exceptional power savings and increased lamp life compared to the TrojanUV4000
- Reduction in overall operating costs and simpler maintenance
- The ability to operate the existing TrojanUV4000 system while installing the new UV system

The new system will be installed in early 2017 and be operational in summer 2017. With the high cost of power in Hawaii, upgrading to the new UV system will provide significant power

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savings (75%) and will enable equipment payback in less than 2.5 years.

The TrojanUVSigna installation at Honouliuli WRF will disinfect a maximum flow rate of 12 MGD and average flow rate of 9 MGD. There will be one new channel of equipment with four lamp banks (one is redundant) and space for a 5th (future) bank.

As UV lamp technology evolves and design advancements are made, opportunities for reducing the cost of UV disinfection emerge. Honouliuli and Veolia recognized this opportunity and decided to upgrade to the TrojanUVSigna. In addition to the financial benefits, the TrojanUVSigna reduces the WRF's environmental footprint for disinfection thanks to the high-efficiency lamps and low power consumption.

The TrojanUVSigna is specifically designed for large-scale wastewater disinfection applications, makes upgrading from previous UV systems easier, and simplifies maintenance for the wastewater treatment plant operations staff.

TrojanUV Solo Lamp Technology combines the best features of both medium and low-pressure lamp technology:

BENEFITS OF MP LAMPS

- Low lamp count and small footprint
- Dimmable from 100 to 30% power

BENEFITS OF LPHO LAMPS

- Low power consumption (~1/3 the energy usage of MP lamps)
- Long lamp life (>15,000 hours)
- Low carbon footprint



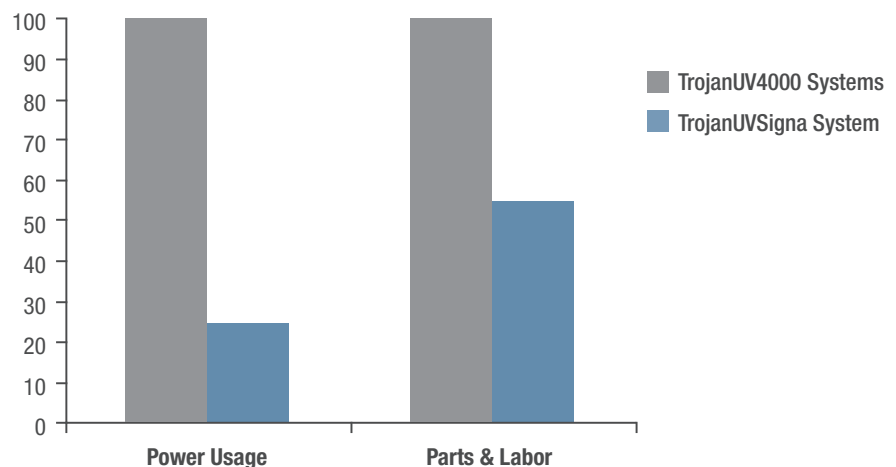
SYSTEM DESIGN PARAMETERS

- **PEAK DESIGN FLOW:** 12 MGD
- **DESIGN UVT:** 70%
- **DELIVERED UV DOSE:** >100 mJ/cm²
- **DESIGNED TO THE NWRI 2012 WATER REUSE GUIDELINES**
- **SYSTEM INCLUDES:** One channel with four UV banks (one redundant)

HONOULIULI UV EQUIPMENT COMPARISON

	TrojanUV4000 System	New TrojanUVSigna System	Difference
Peak/Avg. Flow	12/9 MGD	12/9 MGD	
Upstream process	Tertiary Filters (sand)	Tertiary Filters (cloth)	
# Channels	1	1	
# Banks	4 (3+1)	4 (3+1) with option for 5 th	
Lamp Type	Medium-Pressure 3200 Watts per Lamp	Low-Pressure High-Output 1000 Watts per Lamp	
Maximum Connected Load	>800 KW	<200 KW	>70% reduction
Power to treat avg. flow	>300 KW	<100 KW	>70% reduction

Summary of Savings Offered with TrojanUVSigna



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