R. M. TOWILL CORPORATION
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Clean Design for Wastewater

1. Biotrickling filters at Sand Island WWTP. **2.** RMTC environmental engineers overcame the challenges of a remote environment and designed a WWTP on the island of Roi Namur, Kwajalein Atoll, of the Marshall Islands.

Leighton Lum, PhD, PE, Chief Environmental Engineer and newly appointed Vice President of the R.M. Towill Corporation, modestly downplays his work in wastewater by claiming he's been in a lot more exciting situations than he encounters on the job—like the 7.1 magnitude San Francisco earthquake in 1989 during an environmental engineering convention. Perhaps being at the helm of environmental engineering for a pioneering company whose work extends from Honolulu to remote Pacific atolls to South Korea doesn't make the daily news very often, but excitement, or the lack thereof, doesn't diminish the significance of wastewater management.

Lying at the edges of our consciousness is a vast and largely unseen system that makes the visible part of our lives pleasant by taking away the wastewater generated by it. Today, RMTC has or is currently involved in the planning and/or design of many wastewater systems in the State and Pacific Region, including the biggest treatment plant in Hawai'i—the 90 mgd (million gallons per day) capacity Sand Island Wastewater Treatment Plant.

It wasn't always that way. Throughout the 1960s, local engineering companies, including RMTC, did work only on small plants, *i.e.*, up to 1 mgd. Large plant design was given to more qualified and experienced mainland firms. That would change just before the passage of the Federal Water Pollution Control Act of 1972 (since renamed the Clean Water Act), when RMTC made its move. "This company has always had a vision for the future," said Donald Kim, former CEO, referring to RMTC's efforts to break into major environmental engineering design work. "We have sought better ways to improve the environment and haven't spared any effort to do it."

RMTC determined the level of expertise the City and County of Honolulu needed and acquired the proper personnel. As a result, it was awarded a major design contract for the Sand Island Wastewater Treatment Plant (WWTP)—the first large-scale work in Hawai'i by a local company. Operational since 1978 and still the largest in the State, the Sand Island WWTP services the area stretching from Kuliouou Valley in east Honolulu to Aliamanu in the west. The second major RMTC project was the Honouliuli WWTP, built in 1983 and servicing the area from Halawa, up through Mililani and to Ko Olina. Other projects of note include the 5.2 mgd Waianae WWTP secondary upgrade; new wastewater reclamation facilities in Makena; Kona International Airport; and most recently, the design of a portion of the emergency bypass pipeline serving the environmentally critical Waikiki area.

Wastewater projects have taken RMTC staff all over O'ahu and the Neighbor Islands, including Lana'i. Other projects have taken them to remote Pacific locations like the Kwajalein Atoll and the Island of Ebeye of the Marshall Islands. RMTC has designed facilities ranging in size from the largest in the State to systems for small communities and individual ones for private homes. The firm has been involved in all wastewater infrastructure from

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its point of generation to its disposal.

But beyond the technical aspects of environmental engineering and RMTC's broad scope, Dr. Lum insists the approach to each project is key. "One has to step back and view the project from all angles and express thoughts to facilitate development of an optimal solution," he says. For example, during work on the Ala Moana Force Main Modification project, abandonment and replacement of a 50-year-old force main was considered because its useful life was thought to be over due to its age. Dr. Lum had another idea and suggested inspection of the line, which was substantial in cost at $300,000, but could save over $20 million if the facility was proven good. Results were positive—the line turned out to be in almost new condition.

3. RMTC designed secondary treatment processes for the existing Waianae WWTP 5.2 mgd primary treatment plant.

Dr. Lum and his team have demonstrated open mindedness and willingness to try new solutions. At a conference in Los Angeles, Dr. Lum met a rep from a manufacturer of a new system that uses lava rocks to control odor. Dr. Lum asked the rep on the spot if he would drive him out to the site using it. Lava, which is durable and has a high surface area, is used to grow bacteria that removes odor. RMTC engineers investigated the "biotrickling" system and found it viable for the Sand Island WWTP (*see photo* 1). "It's very simple, cheap to build and run—and no, the lava isn't from the Big Island," Dr. Lum said with a smile.

"One of the keys to success," reflected Dr. Lum, "is to realize you never know everything, and to listen to everyone involved—from operations to engineers." But he doesn't claim the successes for himself. Through the years, the environmental engineering team has gained a lot of experience through implementing new technologies, says Dr. Lum, and credit goes to the many good people at RMTC, along with a cohesive, supportive management. It's all in a day's wastewater work—important, but at the edges of consciousness for most.

RMTC PROFILES

If perspective is important to Leighton "Doc" Lum's environmental engineering work, it also plays a big part in his personal life. "If you do other things [besides work], you can see things from a broader viewpoint," says the R.M. Towill Vice President and Chief Environmental Engineer.

Above: Dr. Leighton Lum at his desk in front of a row of family photos.

Dr. Lum chose environmental immunology and engineering as a career because it involved a combination of basic engineering, microbiology, chemistry, oceanography and computer systems and modeling. He earned his undergraduate and master's degrees from the University of Hawai'i at Manoa, and a doctorate in Environmental Health Engineering from the University of Texas at Austin. Joining the R.M. Towill Corporation in 1979 right after graduate school, Dr. Lum has gained the respect of colleagues and clients over the past 27 years with a pragmatism that cuts straight to the heart of an issue.

Dr. Lum says he wouldn't call himself a workaholic. "I try to be very efficient because I'm lazy," he jokes. But a balanced life does allow for other endeavors. Dr. Lum earned his stockbroker's license and paid his dues the first seven or eight years by "learning how not to lose money." He manages investments for a few friends, for RMTC's pension fund and for Kalihi Union Church, where he teaches Sunday School to 5th graders.

It's kids he really enjoys. An AYSO coach for kids under 12, Dr. Lum also teaches tennis (his "first love," which he plays weekly) to a group of kids when soccer season is over. Besides watching UH football "when they win" and a round of golf once in awhile, Lum would also like to surf, if only there was an uncrowded spot close to shore.

"My son [Jonathan, 10] is really sweet," says Lum, who spends a lot of his free time with his two children, "and my daughter [Karalyn, 5] is—real interesting. Lively. She thinks of all kinds of things and is excited about life." He and his wife Valerie adopted Karalyn from China to have a second child to go with their biological son. The Christian missionary-based adoption agency they used asked to rent one of the two studio apartments in their backyard. The Lums allowed them to use it rent-free. It's a kid's thing. And a perspective thing too—one that makes the best use of resources for the benefit of others.

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