

CITY COUNCIL

CITY AND COUNTY OF HONOLULU
530 SOUTH KING STREET, ROOM 202
HONOLULU, HAWAII 96813-3065
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March 28, 2012

RECEIVED
CITY CLERK
C & C OF HONOLULU
2012 MAR 30 AM 11:52

TO: Councilmembers

FROM: Councilmember Ikaika Anderson
Councilmember Romy Cachola
Councilmember Ann Kobayashi 

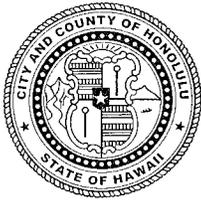
RE: Final Report of the Permitted Interaction Group to Investigate and Tour the San Francisco Wastewater Treatment Plant in San Francisco, California

Pursuant to Resolution 11-350, FD1 which established the Permitted Interaction Group (PIG) to inspect two operating wastewater treatment plant digesters located in San Francisco, CA, please find the attached reports summarizing our findings and recommendations for Council's review.

Mahalo.

Attach.

Copy: City Clerk
Office of Council Services



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March 12, 2012

Memorandum

TO: Council Chair Ernie Martin, Honolulu City Council
Clayton Wong, Fiscal Officer, Honolulu City Council

FROM: Councilmember Romy M. Cachola

SUBJECT: Tour of San Francisco Wastewater Treatment Plants
San Francisco, California
January 14 - 18, 2011

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HONOLULU, HAWAII

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Romy M. Cachola

I am submitting this report which summarizes my observations and findings during a site visit and inspection of several wastewater treatment plant digesters in San Francisco, California. The Honolulu City Council, through Resolution 11- 350 FD1, established a Permitted Interaction Group (PIG) comprised of myself and my fellow Council colleagues Ikaika Anderson and Ann Kobayashi.

PIG members visited San Francisco's Southeast Water Pollution Control Plant, which is located in the Bayview District; and Oceanside Water Pollution Control Plant, located off the Great Highway near the San Francisco Zoo. In addition, PIG members met with project managers from HRP, several representatives of technology providers and a representative from Matrix Services, Inc., an engineering firm charged with digester design, construction and operation.

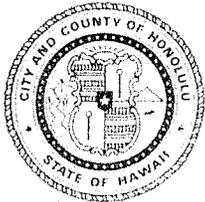
HRP has proposed constructing and operating, at no capital cost to the City, a second digester at the Sand Island Wastewater Treatment Plant. This would result in a savings of \$26 million to the City. HRP's technology is a waste-to-energy process, rather than a waste-to-pelletized fertilizer like the current technology at the Sand Island Wastewater Treatment Plant. Energy produced by a waste-to-energy facility would be sold at comparable market rates to the City with the revenue serving to recover capital expenses for construction. At the end of a set term, HRP would transfer ownership of the capital assets to the City for free or at a substantially-reduced cost.

We were informed of the benefits of this waste-to-energy technology, which eliminates the need to dry and convert sludge to pelletized fertilizer. There is also no need to construct an additional storage tank.

Aside from saving money, when it comes to the operation of a waste-to-energy facility as well as other support services, the cost would be \$1 million less than what the operator would charge the City. The operator is also willing to camouflage the digesters for aesthetics purposes. There was discussion to shape or design the digester into a pineapple, which would be more visually appealing for Honolulu's skyline.

The experience of visiting these two San Francisco facilities and having an opportunity to speak with facility staff made it clear that Honolulu's current waste-to-pelletized-fertilizer technology and failure to employ co-generation technology at its wastewater facilities, especially at Sand Island, has resulted in a significant lost opportunity to help reduce operating expenses. The systems in operation at Oceanside and Southeast show that large-scale digesters, when operated in conjunction with a waste-to-energy facility, are an efficient and effective means of treating sewage sludge. Similarly, I believe that it would be in Honolulu's best interests to carefully consider a similar facility to treat our own sewage sludge.

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February 8, 2012

TO: Ernest Y. Martin, Council Chair

FROM: Councilmember Ikaika Anderson 

SUBJECT: San Francisco Trip Report
January 14 – 18, 2012

This report summarizes my findings and observations during my recent site investigation and tour of several wastewater treatment plants in San Francisco. This trip was funded through a gift to the City from HRP 56, LLC (“HRP”) for the aforementioned purposes. Through Resolution 11-350, FD1 the Council established a Permitted Interaction Group (“PIG”) comprised of Councilmembers Ann Kobayashi, Romy Cachola and myself.

The PIG had the opportunity to visit San Francisco’s Southeast Water Pollution Control Plant, located in the Bayview District, and the Oceanside Water Pollution Control Plant, located off the Great Highway near the San Francisco Zoo and immediately adjacent to the coastline. In addition, we also had an opportunity to meet and talk with project managers from HRP, several representatives of technology providers and a representative from Matrix Services Inc. which is an engineering firm familiar with digester design, construction and operation.

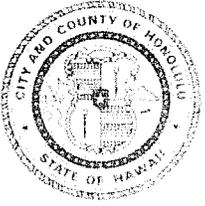
HRP is solutions provider that has proposed constructing and operating, at no capital cost to the City, a second digester at Sand Island Wastewater Treatment Plant. Unlike the existing digester program, HRP is proposing an electricity cogeneration program utilizing several emerging technologies. Under this proposal the energy produced by the cogeneration program would be sold at comparable market-rates to the City with the revenue serving to recover the capital expenses for construction of the facility. At the end of a set term HRP would transfer ownership of the capital assets to the City.

The process of capturing biogas from the digesting of sewage sludge to generate electricity is not an inherently new process. There are numerous wastewater facilities which operate cogeneration facilities that are, for the most part, cost effective.

The Southeast Water Pollution Control Plant has been operating a cogeneration facility for several years. Our group had an opportunity to speak with supervisory staff at the facility and hear their first-hand experiences with the cogeneration process. Until recently, the facility basically captured the biogas produced by a converted digester and fed it to a generator to produce electricity. Biogas is often confused with "natural gas" that is commercially produced. Although they are both chemically similar "natural gas" is processed and cleaned of impurities before it's delivered to the consumer. Biogas contains numerous impurities such as: carbon dioxide, hydrogen and nitrogen. As a result of these impurities the BTU value of biogas can be as much as 40% lower than natural gas. These impurities typically also cause accelerated wear on the generation components leading to more frequent equipment failures. By installing a filtering (or "scrubbing") system between the digester and the generator Southeast Water was able to remove the impurities and deliver a biogas to its generator which was far more similar to "natural gas". The staff noted that since the installation of the biogas filter system they had seen notable improvements in the cogeneration facility's efficiency, stability and reliability.

We also visited the Oceanside Water Treatment Plant, located off the Great Highway near the San Francisco Zoo. The facility utilizes four large egg-shaped digesters each with a maximum capacity of 750,000 gallons, although not all four digesters are not typically in operation at the same time. Typical processing capacity of the Oceanside Water Treatment Plant is 17mgd in dry weather and 65 mgd during storm events. Currently methane gas, generated by the anaerobic digestion, is recaptured and used to produce some energy with the remaining gas being burned off. The treated biosolid is used as landfill cover or soil amendments for farmland; the current product is classified as Class B. Of interest is the fact that the facility is in the process of converting one of their digesters to a thermophilic batch process. The operator also noted that two of the largest problems that the facility has to deal with are the intrusion of windblown sand into the sewer system, which results in build-up within the digesters, and problems with corrosion of the equipment due to its close proximity to the ocean. Despite these issues, the facility has experienced virtually no down-time of its digesters; except for routine maintenance.

The experience of visiting these two facilities and having an opportunity to speak with facility staff made it clear that Honolulu's failure to employ co-generation technology at its wastewater facilities, especially at Sand Island Wastewater Treatment Plant, has resulted in a significant lost opportunity to help reduce operating expenses. Although the use of raw biogas (i.e. unfiltered methane from the digester) is a less desirable approach, it is more preferable to put this gas to some use rather than simply flaring it off. The systems employed at both Oceanside and Southeast show that large-scale digesters, when operated in conjunction with a cogeneration facility, are an efficient and effective means of treating sewage sludge. Honolulu should be actively pursuing co-generation at all its waste water facilities.



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MEMORANDUM

Date: February 7, 2012

To: Ernest Martin, Council Chair
Clayton Wong, Fiscal Administrator

From: Councilmember Ann Kobayashi *AK*

Subject: Travel Report Site Visitation - San Francisco's Southeast and Oceanside Wastewater Treatment Plants

Pursuant to the adoption of Council Resolution 11-350, FD1, I was very fortunate to be a member of a permitted interaction group (P.I.G.) which traveled to San Francisco, California to tour various wastewater treatment plants. Traveling from January 14 to January 18, 2012, my trip allowed me to extensively learn about the operations of other municipal plants, explore alternative wastewater treatment technologies, and study the proposed system being managed by HRP 56, LLC in San Francisco.

Attached are brief highlights and findings, as well as an informational packet provided by HRP 56, LLC. Please feel free to call me if you have any questions.

Thank you.

Attachments

1. Oceanside Water Pollution Control Plant

In San Francisco, egg-shaped digesters are only used at the Oceanside Plant where 20% of the City's wastewater is treated. As all operations are indoors, no odors are released into the surrounding area. Pending the conditions of the weather, up to sixty-five million gallons of wastewater can be treated per day. The plant is built on 12 acres with 70% of the facility being underground.

2. Southeast Water Pollution Control Plant

The Southeast Treatment Plant treats about 67 million gallons of wastewater per day during dry weather conditions and up to 250 million gallons per day during rain storms. 80% of the City's total wastewater flow is treated at this plant, while it also treats a small amount of wastewater from other smaller municipalities such as, the City of Brisbane and Daly City.

3. Conclusion

Currently, the technology the P.I.G. inspected in San Francisco is being operated at approximately 70 digesters around the nation. With the use of egg-digesters at San Francisco's Oceanside Water Pollution Control Plant, it is evident that the City and County of Honolulu can utilize other proven technology other than the one being implemented by Synagro. Solids are treated for nearly 28 days in anaerobic digesters that contain bacteria that digest, stabilize, and reduce the sludge. This process produces methane gas that is burned to create electricity and heat. Enough electricity is generated to operate the entire plant. The remaining treated biosolids are used for landfill cover or soil for farmland.