



# University of Hawai'i at Mānoa

## Environmental Center

A Unit of Water Resources Research Center  
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July 7, 1994  
RP:0162

Ms. Gina Ichiyama  
Department of Accounting & General Services  
P.O. Box 119  
Honolulu, Hawaii 96810

Dear Ms. Ichiyama:

### Stream Channel Alteration Permit Application Waiakea Stream - 10-inch Sewer Line Hilo, Hawaii

The referenced permit application considers installation of a 10-inch sewer line across Waiakea Stream to allow the conveyance of wastewater from a proposed University of Hawaii at Hilo, University Park, development to the municipal sewage system.

We have reviewed this supplemental document with the assistance of Norby Nielsen, Civil Engineering; David Penn, Geography; Daniel Walker, Hawaii Institute of Geophysics; and Malia Akutagawa of the Environmental Center.

Our reviewers feel this project will not adversely affect the water quality or infauna of Waiakea Stream as long as the sewer line is constructed in exact compliance with the specifications set forth in the document. However, the State needs to clarify emergency response procedures should the sewer line break and effluent be released into the stream. In addition, the document needs to confront issues of cultural and archaeological significance.

#### Earthquakes and Flooding

The proposed sewage line across Waiakea Stream, must withstand both heavy flooding and shifting of rocks, and strong ground motion during an earthquake. The document describes the 10 inch sewage pipe as being encased in a concrete jacket 3 feet

Ms. Gina Ichiyama  
July 7, 1994  
Page 2

in width and laid beneath the stream bed (p. 10). This arrangement appears structurally sound.

Compared to other parts of Hawaii, the Hilo area is relatively stable. Earthquakes usually result from deep crustal adjustments which differ from the strike slip earthquakes or vertical faulting typically found in California. Thus, it is highly unlikely that the pipe would be sheared in half. During an earthquake, the stream bed and the sewage line most likely will not be subject to differential movement but will move as one unit. The 3 feet concrete jacket should ensure adequate stability, and PVC piping would allow greater flexibility than ductile iron pipe.

Although the construction specifications appear structurally sound, the State should develop an emergency response plan. Alternate routes of flow should be incorporated in the plumbing in the event that there is a breakage in the sewage line. Stream clean up measures should also be incorporated into the plan in response to a sewage spill.

#### Protection of Aquatic Species

It was noted that flow in the lower reaches of Waiakea Stream where the University is located is intermittent. However, field observations revealed numerous and diverse infauna such as the introduced guppy, *Poecilia reticulata*; the introduced swordtail, *Xiphophorus helleri*; young o'opu nakea, *Awaous stamineus*; the mosquitofish, *Gambusia affinis*; the crayfish, *Procambarus clarki*; tadpoles, *Bufo marinus*; snails, *Lymnidae*; and dragonfly naiads, *Anax spp.*

To avoid or minimize stress on these species by sediment loading, trenching should be undertaken when the stream is not flowing in that area. The State, if it hasn't already, should explore the option of using PVC pipe, since it possesses a greater longevity than other types. As a consequence, less repair or maintenance and attendant disturbance to the natural stream habitat is likely.

#### Cultural and Archaeological Significance

While many physical aspects of the proposed project impacts are assessed, this document fails to investigate the site's cultural significance. At the very least, archaeological and cultural reconnaissance surveys and information-gathering should be conducted in conjunction with the permit application so that potential adverse impacts to cultural features, remains, and integrity can be identified and completely avoided before actual work begins.

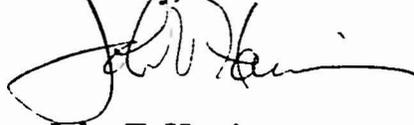
Ms. Gina Ichiyama  
July 7, 1994  
Page 3

A permit was recently issued by the Commission on Water Resource Management for similar stream crossings in Windward Oahu. Several Hawaiian burials were unearthed during the work. Under existing law, these discoveries were considered "inadvertent," thereby allowing developers to move the bones. If surveys had been required prior to commencing work and resulted in the discovery of the remains, then these discoveries would not be "inadvertent" and the question of preservation in place versus transporting the bones elsewhere would be decided by the island Burial Council. The state must take proper measures to prevent a repeat performance of this scenario.

Summary

We conclude that it is unlikely that the proposed construction of a sewer line will adversely affect water quality or threaten aquatic inhabitants of Waiakea Stream. However, the supplemental information lacks any reference to issues of cultural and archaeological significance and fails to disclose a response plan should sewage effluent be discharged inadvertently into the stream. These concerns should be addressed before the project is approved.

Sincerely,



John T. Harrison  
Environmental Coordinator

cc: OEQC  
Roger Fujioka  
Norby Nielsen  
David Penn  
Daniel Walker  
Malia Akutagawa