



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2003GU25B

Title: Evaluation of animal and aquaculture waste regulations and development of Best Management Practices (BMP) for Guam and CNMI.

Project Type: Research

Focus Categories: Waste Water, Management and Planning, Education

Keywords: Aquaculture effluent; swine waste management; BMP; regulations

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End Date: 02/29/2004

Federal Funds: \$35919.00

Matching Funds: \$0.00

Congressional District: NA

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Abstract: Regulations for animal waste and aquaculture effluent in Guam and the Commonwealth of the Northern Marianas Islands follow the federal Water Quality Act and other waste management laws and regulations. It is, however, an unmonitored activity. Most producers and officials are confused or unclear about what regulations apply and how to regulate the industry. The great majority of fish farms in the region practice a semi-static system of water quality management in which the tank or pond is partially drained periodically and an equivalent amount of new water is added back into to the system. The fish waste that accompanies this discharged water is then either dumped straight on to the ground or into the nearest stream or river. The impact of these production practices are unknown for Guam and the CNMI. There is concern that waste discharged onto ground surfaces will percolate down to the aquifer, contaminating valuable drinking water sources. Effluent discharged directly into surface waters contribute to the eutrophication of the stream systems. The impacts of these practices must be better defined so that effective management practices and regulations can be implemented. This project will conduct percolation studies at three (3) locations in Guam where aquaculture is discharged onto ground surfaces. Tensiometers will be placed at three depths (1, 2, and 4 feet) at the discharge point for an aquaculture production tank in three locations in northern Guam to determine the amount of discharge

reaching these depths. Samples from the tensiometers will be collected twice weekly and analyzed for total ammonia, nitrite, nitrate, and phosphorous. A rain gauge will be installed at each site to determine rainfall. Water samples will be analyzed on a YSI Photometer. Water quality will be analyzed at two stream sites where effluent is discharged directly into the stream. Water samples will be collected and analyzed weekly. Samples will be taken from 200 yards upstream from the closest discharge pipe; directly in front of a discharge pipe and 100 yards downstream from the closest discharge pipe (in the case of multiple discharge pipes). Water will be analyzed for dissolved oxygen, carbon dioxide, total ammonia, nitrite and nitrate, phosphorus, turbidity, salinity. This will provide information on the impact of the farm to the stream. Total discharge loads will be determined by attaching a flowmeter to discharge pipes extending into the stream. Results of these studies will be used to make recommendation on the effluent regulation for the aquaculture industry. Also, a Best Management Practices guide will be developed for use by producers and regulatory agencies. The Guam Cooperative Extension Service at the University of Guam and the Cooperative Research Extension and Education Service at the Northern Marianas College (Saipan, Rota, and Tinian) will conduct workshops to educate producers and regulatory agencies about the issues of aquaculture effluent and their impacts. Guam will conduct 2 workshops and CNMI will conduct 1 workshop each in Saipan, Rota and Tinian.

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