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Docket# 00-AFC-12

Marine Biological Resources

November 18, 2000

I am an ichthyologist with interests in fishery biology and marine ecology and more than forty years of experience working with California marine fishes. I have read the appropriate sections and appendices from the Application for Certification by Duke Energy to the California Energy Commission with special interest in the fish assemblages. Several points must be made at the outset. This facility, operational since the early 50's, has been exempt from any regular monitoring program and further has not been subject to the limits of the California Thermal Plan. No matter how well the existing data is analyzed, there is far too little comparable data to draw any significant conclusions about the affect that5 this plant has had on the marine resources of the area.

Duke proposes to de-activate the existing plant and build a new, more efficient one at an adjacent site. In order to remain exempt from the California Thermal Plan, it will utilize the existing outfall system already grandfathered into the Plan. Even though the new facility may reduce thermal pollution and perhaps entrainment and impingement, the new facility should meet all criteria of the California Thermal Plan.

With regard to the fish assemblages, neither PG&E or Duke have participated in previous studies of Morro Bay, the estuary that contributes cooling water to the plant. The three fish studies: Fierstine et al,(1970) carried out between 1969-1970; Horn's (1980) two year beach siene study form 1974-1976; and Fish and Games present otter trawl study(unpublished), 1992-present, used different methodologies and are not at all comparable. Only one set of impingement data, PG&E's 1977-1978(1982) is available to compare with Tenera's recent study and the only entrainment study is the present one(1999-2000) from Tenera which at this point includes only 8 months of data . The California inshore fish fauna undergoes large swings in species structure and diversity primarily associated with temperature changes(El Nino/La Nina), recruitment success, and changes in mortality(including natural mortality, fishing mortality, and other anthropomorphic affects). An occasional sampling year can tell us very little or nothing about cause and effect, and this is the condition of the MBPP data. We can only speculate about what the species changes noted in the Morro Bay data mean. Should we be pleased that the endangered

tidewater goby *Eucyclogobius newberryi* was not entrained or should we ask what has happened to this species which was an important member of the bay assemblage when Harry Fierstine sampled it in the late 60's? We are not tied to commercial (or sport) fishes in an analysis of effect, but only these species are discussed. *Citharichthys stigmaeus* the speckled sand dab and *Cymatogaster aggregata* the shiner perch were among the most entrained species and both have suffered huge population declines in southern California. In 1977-8, the Bocaccio *Sebastes paucispinnis* was heavily impinged with no follow up studies. It is now a species in serious decline. When *Neoclinus sp.* fringeheads, appear in both entrainment and impingement data and we know nothing about their population levels north of Pt. Conception, what do these data mean? If this proposed application is approved, it would be criminal to not require at least 7 years of continuous monitoring (Morro Bay, Impingement, and entrainment) to give us some information about plant effects. Assuming that the plant will be down for some time and that that period could be used as a minimal "before" study, even a BACI type design could be employed. Morro Bay is one of very few estuaries left near southern California and its fauna should be sustained.

As far as the receiving waters are concerned, if they allow the existing outfall system to remain, the only identifiable impact will probably be at station I where the present fauna is largely species well represented in southern California and where the algae is depauperate. This site is typical of a warm water discharges affect upon a rocky shore environment and it is not so different, except in magnitude, from the changes noted at Diablo Canyon. Elsewhere any presumptive affect will be masked by rapid mixing in the surf and the ephemeral nature of soft substrate communities.

All in all, with regard to the marine biological resources, this application gives us essentially no information to suggest that the existing plant has harmed the resource or that the new one would be much different. This is because no ongoing monitoring was ever required of the facility.

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BORN

May 12, 1932

EDUCATION

B.A. (1954), Stanford University M.A. (1957), University of California, Los Angeles Ph.D. (1960), University of California, Los Angeles

POSITIONS

Teaching Associate, University of California, Santa Barbara, 1958-59 At Occidental College since 1959
Assistant Professor, 1960-65 Associate Professor, 1966-72 Professor, 1972-74
James Irvine Professor of Environmental Biology, 1974-93 Faculty Council President, 1980-82
Director, Vantuna Research Group, 1969-95 Chairman, Department of Biology 1971-74
Consultant, Southern California Edison-Effects of Coastal Generating Stations on Marine Biota
Co-Chairman/Coordinator, Third International Artificial Reef Conference, 1984, Irvine, CA
Consultant, Scientific advisor to gill net initiative ABI (1988)
Academic Member-Directors Marine Resources Advisory Committee, Dept. of Fish and Game, 1988- 1 *qq_5*
Member, Peer Review Panel, Orange County Sanitation District Consultant, Ballona Wetlands Redevelopment
Consultant, NMFS-Effects of DDT-PCB Deposition on nearshore fauna and possible mitigation
Member, Directors Advisory Committee, California Department of Fish and Game James Irvine Professor Emeritus, June 1993
Executive Director, Vantuna Research Group, June 1995

MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS

American Society of Ichthyologists and Herpetologists,
Sigma Xi
Society for Systematic Zoology
American Society of Zoologists
American Institute of Fishery Research Biologists
American Fisheries Society
Convenor, SNICCR

RESEARCH INTEREST

Ecology and systematics of fishes
Effects of manmade environments on fishes Pollution and fisheries biology