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CLASS: <u>U</u> PROP INFO	INPUT	NO CYS REC'D 4	DOCKET NO: 50-275 <u>50-323</u>			

DESCRIPTION:
Ltr trans the following:

PLANT NAMES: Diablo Canyon, Units 1 & 2

ENCLOSURES:
Specific Comments on Draft Enviro Statement for the Diablo Canyon Units 1 & 2

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| 1-ASLB-YORE/SAYRE | 1- CONSULTANT'S | 1-AGMED(WALTER KOESTER, |
| WOODWARD/H ST. | NEWMARK/BLUME/AGABIAN | RM C-427, GT) |
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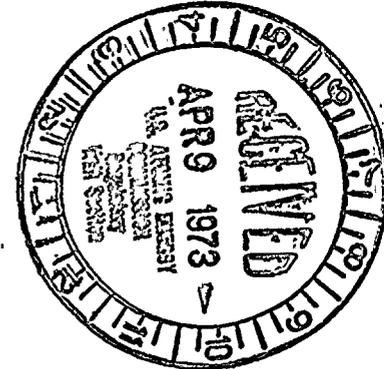


50-275
50-323

Air Resources Board
Colorado River Board
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State Lands Commission
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THE RESOURCES AGENCY OF CALIFORNIA
SACRAMENTO, CALIFORNIA
APR 3 1973

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Directorate of Licensing
U. S. Atomic Energy Commission
Washington, D. C. 20545

Attention: Mr. Daniel R. Muller

Gentlemen:

The State of California has reviewed the Draft Environmental Statement related to the continued construction and proposed issuance of an Operating License for the Diablo Canyon Units 1 and 2 for Pacific Gas and Electric Company, Dockets Nos. 50-275 and 50-323, which had been submitted to the Office of Intergovernmental Management (State Clearinghouse) within the Governor's Office. This review fulfills the requirements under Part II of the U. S. Office of Management and Budget Circular A-95 and under the National Environmental Policy Act of 1969.

The Draft Environmental Statement was reviewed by the State Departments of Commerce, Conservation, Fish and Game, Food and Agriculture, Housing and Community Development, Justice, Navigation and Ocean Development, Parks and Recreation, Public Health, Public Works (Division of Highways), and Water Resources; State Water Resources Control Board; Reclamation Board; Air Resources Board; and Public Utilities Commission. The State's general comments are given in the following paragraphs, and specific comments are attached.

The Statement gives the impression that the conclusions were based on well-studied environmental impacts. Additional evidence must be presented to support some of the conclusions. Modification of the Statement is necessary in order to set forth clearly the predicted effects of the discharge and to identify areas where additional data are needed to quantify completely the impact of the proposed plant operation.

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Principal sections that should be presented with more precise information are: the thermal plume predictions, including the temporal and spatial effects in the receiving waters during both normal operation and heat treatment for the control of fouling organisms; the impact of entrainment in terms of number of biomass of marine fauna killed; the effect of chemical additions on aquatic life; and an assessment of the cost of the project in terms of modification in marine life.

The staff should recognize that many predicted conclusions on ecological costs are not really known and that the entire problem needs to be examined with appropriate onsite studies and all data requirements identified.

Therefore, we recommend that the Statement be redrafted to take into account our comments and recommendations.

The attached pages of specific comments are an integral part of this letter. Thank you for the opportunity to review this Draft Environmental Statement.

Sincerely yours,

N. B. LIVERMORE, JR.
Secretary for Resources

By Paul L. Clifton

Airmail
Attachment



1. The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that this is essential for ensuring the integrity of the financial system and for providing a clear audit trail. The text notes that without proper record-keeping, it would be difficult to identify and prevent fraud or errors.

2. The second part of the document outlines the specific procedures for recording transactions. It details the steps involved in entering data into the system, including the use of standardized codes and the requirement for double-checking entries. The text also mentions the importance of regular backups and the use of secure storage methods to protect the data from loss or theft.

3. The third part of the document discusses the role of technology in modern record-keeping. It highlights the benefits of using computerized systems, such as increased efficiency and the ability to handle large volumes of data. However, it also notes the challenges associated with technology, such as the need for regular updates and the risk of system downtime. The text suggests that a combination of manual and automated processes may be the most effective approach.

4. The fourth part of the document addresses the issue of data security. It discusses the various threats to data, including malware, phishing, and insider threats. The text provides recommendations for how to mitigate these risks, such as using strong passwords, implementing multi-factor authentication, and conducting regular security audits. It also emphasizes the importance of employee training and awareness in maintaining data security.

5. The fifth and final part of the document concludes by summarizing the key points discussed. It reiterates the importance of accurate record-keeping and the need for a robust security strategy. The text encourages organizations to stay up-to-date on the latest trends and technologies in the field of record-keeping and to continuously improve their processes to ensure the highest level of accuracy and security.

SPECIFIC COMMENTS
DRAFT ENVIRONMENTAL STATEMENT
Diablo Canyon Units 1 and 2

Page 2-29, Item: Seismology. It is said that the maximum earthquake that might disturb the Diablo Canyon Nuclear Reactor Powerplant site could cause a ground acceleration of 0.20 g at the site. A 1:1,000,000 scale map showing maximum peak accelerations to be expected in bedrock throughout California was prepared in December 1972 by the California Division of Mines and Geology at the request of the Division of Highways. This generalized map indicates a maximum peak acceleration of 0.28 + 0.10 g for the Diablo Canyon area. The 0.20 g ground acceleration used in the Draft Environmental Report thus appears to be an appropriate order of magnitude of ground shaking to be expected at the reactor site.

Page 2-49, Paragraph 3. The first sentence should be clarified as follows: "Much of the bottom deeper than 20 feet is composed of flat bedrock, boulders, cobble, and sand in all mixtures, and therefore does not provide the necessary abalone habitat". It should be emphasized that the areas within the cove which are less than 20 feet in depth provide extremely important habitat for abalone.

Page 2-51, Figure 2.16. It was stated that this figure presents a list of fish commonly taken in rocky bottom habitats in the Diablo Canyon area. However, this figure was quoted from a Department of Fish and Game publication, Fish Bulletin 130, where it was intended as a general description of species encompassing many areas along the coast. The following species changes need to be made if this figure is to apply to the Diablo Canyon area:

Shallow Rock - Remove jacksmelt and walleye surfperch; insert striped perch and black perch.

Kelp Bed - Remove jacksmelt, insert pile perch, striped perch, black perch, and vermilion rockfish.

Shallow Reef - Remove canary rockfish, brown rockfish, rosy rockfish, yellowtail rockfish, and turkey-red rockfish.

In addition, juvenile rockfish of several species extend from the Shallow Rock through the Shallow Reef zones. Those species listed for the Deep Reef should be considered as a general list because specific information on their presence in the Diablo Canyon area is not available. This figure should be referenced as "modified from California Department of Fish and Game, Fish Bulletin 130".

Pages 3-20 and 3-21, Item: Staff's Thermal Model and Maximum Thermal Plume. In regard to the area of the 10°, 4°, and 2° isotherm plumes, the first sentence in the second paragraph states: "The staff believes that these results are reasonable for average conditions". We would like clarification as to what was considered an "average" condition. It was further stated that no allowance was made for ocean currents because the currents of the region are entirely



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unpredictable. This statement is not entirely correct; currents in the region are somewhat predictable during the Oceanographic Seasons.

In assuming the "worst case" of a southerly current (southerly direction), it appears that part of the basis for this assumption is the attendant danger of recirculation in the south cove. However, there is no prediction of a condition for a current in the northerly direction bending the plume into the north cove. This condition could occur during the Davidson Season. We would like to see thermal plume predictions for both north and south currents together with tidal and wind conditions. While the maximum thermal plume as shown in Figure 3.9 may occur under completely calm conditions with no current, wind or tidal action, we feel it is an unrealistic prediction of the actual extent of the plume for all conditions. The extent of the various isotherm plumes extending along the nearshore areas needs to be presented in the thermal model, and appropriate figures prepared.

Page 4-15, Item: Breakwater Construction in South Cove. With regard to the statement that "the harbor seals will return to the area when construction is completed", it should be pointed out that construction of the breakwater has been completed for quite some time and no significant return of the harbor seals has occurred to date. The possibility that the displacement of harbor seals may be permanent should be recognized.

Page 4-17, Item: Aquatic Impact (Marine Environment). The second sentence stated that "some siltation has been observed; however, the small amount of silt observed during a subtidal survey on April 3, 1972, suggests that wave action has carried most of the silt out of South Cove and dispersed it in the adjacent ocean area". Information from a diving survey by the state personnel during March and April 1972 did not support this statement. (See Final Report, Burge and Schultz, "Marine Environment in the Vicinity of Diablo".) Their analysis indicated that the sloughing and siltation from the coffer-dam had badly degraded the environment. Sediment buildup of up to 16 inches was noted in some areas, while the rocky reefs had up to 4 inches of silt. It was concluded that the siltation from the breakwater construction was still apparent and that it had caused a major effect through destruction of habitat. This impact should be recognized.

Page 5-14, Item: Chlorine. The first paragraph discusses the effect of excessive use of chlorine where chlorine levels of 5.0 ppm have been measured in the discharge. However, other studies have shown the same effects at concentrations similar to those proposed at Diablo. For example, chlorine when used at concentrations considerably below those required to control fouling had deleterious effects on entrained phytoplankton. (See Carpenter, Peck, and Anderson, 1972, "Cooling Water Chlorination and Productivity of Entrained Phytoplankton", Marine Biology 16, 37-40.) Phytoplankton are apparently very sensitive to the action of chlorine.

The chlorine toxicity information presented in Table 5.8 indicates that marine organisms are highly variable in their response to chlorine. In the reference to Waugh (1964), it was not listed in the table that a concentration of 0.5 ppm for a 10-minute exposure caused heavy mortality for barnacle nauplii. No information is available on the effect of chlorine on abalone adults or larvae,



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or on other invertebrates common to the Diablo Canyon area. In addition, chlorine toxicity to marine fish and their larvae has not been studied extensively. Recent information indicates that a concentration of 0.01 ppm is the level where fish in the receiving water are no longer affected.

Additional information in the literature indicates that the concentrations of chlorine used at Diablo Canyon may be lethal to some forms of marine life. Additional onsite studies will be necessary in order to determine the acute and chronic impacts on both the entrained and receiving water marine life. It appears that chlorine at concentrations necessary for the control of organic growths could have adverse effects. This should be recognized in the Statement.

Page 5-14 through 5-17, Item: Copper. It was stated that the staff expects no adverse effects from releases of copper into the environment. This conclusion was based on the information presented concerning natural occurring copper concentrations in Florida and the effect of copper on marine organisms (Table 5.9). If natural concentrations are to be quoted, values for the ocean water off California should be used, rather than those off Florida where natural levels could be higher. It also appears that the green abalone, as well as other species, are sensitive to the effect of copper. The data presented in Table 5.8 for marine invertebrates are based on relatively short-term tests and in which only mortality was considered. The long-term chronic effects of low levels of copper are not well documented, and the potential for buildup in the food chain should be considered. This potential impact should be recognized.

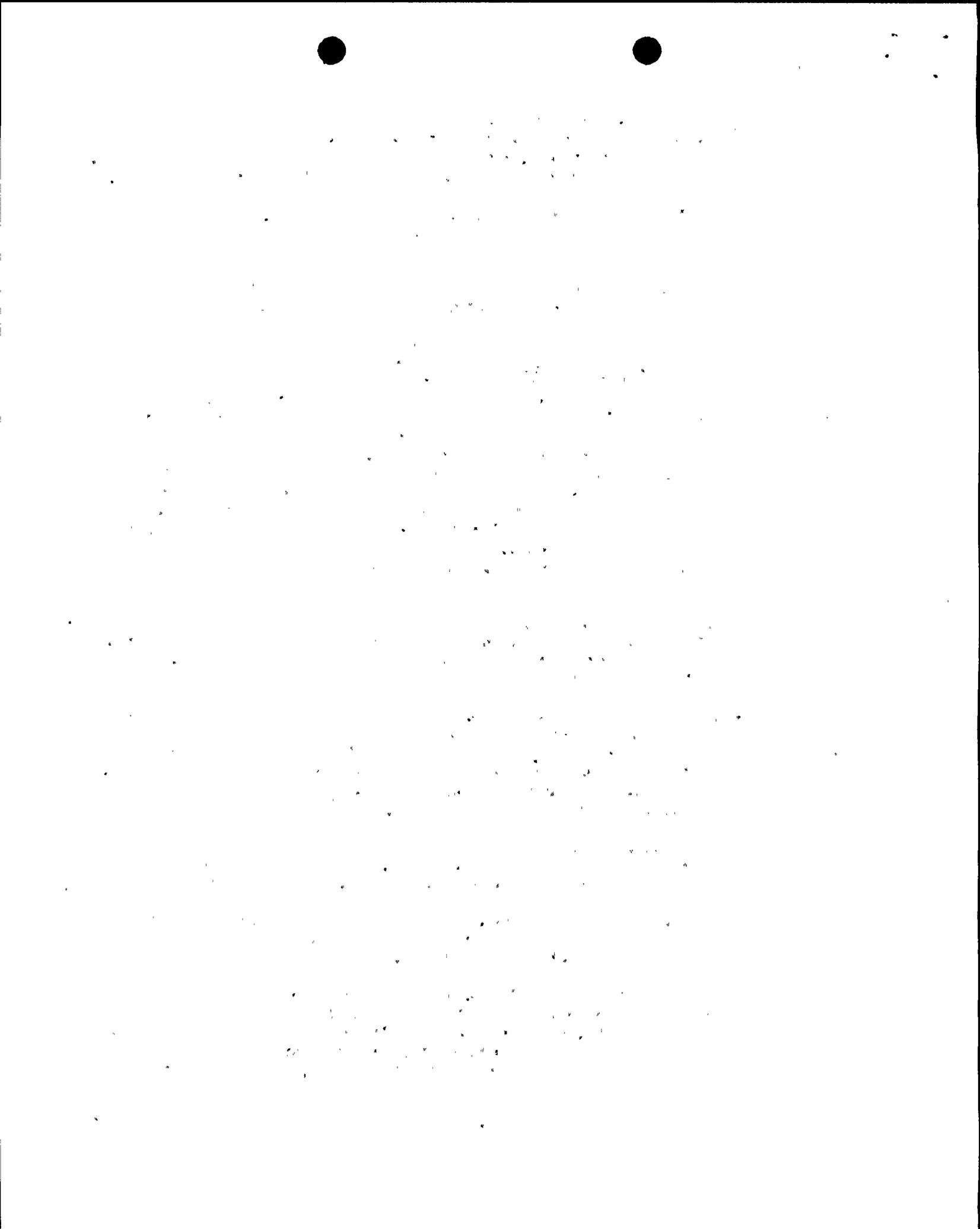
The long-term effects of copper, as well as other heavy metals, in the environment cannot be adequately assessed with the information presented. Additional onsite monitoring in the environment for copper and the other heavy metals released by the plant should be included in the monitoring program.

Page 5-24, Figure 5.2. This figure shows the anticipated discharge plume in relation to zones of plant growth. This projection appears to be for calm conditions, as were the previous projections for isotherms. Under varying current, wind, and tidal conditions, the anticipated plume may extend to different areas, including the important nearshore abalone zone. At times the 4°F isotherm could encompass the entire cove.

Anticipated plumes under other conditions should be presented. In addition, clarification should be provided as to how and where natural sea surface temperatures will be determined in order to predict the various isotherm zones.

Page 5-25, Table 5.14. This table should be titled "Thermal Tolerance Limits of Various Marine Phytoplankton, Algae, and Marine Plants". Eleven species of algae and marine plants are listed in the table.

Page 5-27, Item: Periphyton. In discussing the intake cove temperatures at Diablo Canyon, the expected daily lows of 45°F during March and highs of 63.5°F in the late summer and fall may be infrequent. These were the recorded minimum and maximum temperatures and may not occur daily during these periods. In addition, localized temperatures may vary and at times may be below or above extremes recorded to date.



If the assumptions that only a small area of bull kelp would be affected or that no impact would be seen were based on the anticipated plumes presented previously, we question these projections unless currents, wind, and tidal action are included.

Page 5-28, Item: Invertebrates, (a) Zooplankton. In discussing the studies of delayed mortality to zooplankton, it should be noted that the results were from one 24-hour test. We feel that additional studies are necessary before conclusions about delayed mortality to zooplankton can be made.

The conclusion of the staff that the impact on zooplankton will be insignificant needs to be clarified. The impact on pelagic holoplankton that have short generation times may be insignificant. However, this may not be true for meroplankton (eggs and larvae of fish and invertebrates). Species that spawn only once during the year would have eggs and larvae only during certain seasons. Large numbers of meroplankton could become entrained during these periods, which could result in a significant impact for some species.

Page 5-34, Item: Benthic Communities. In the first paragraph it was stated that "the staff concludes that the impact on benthic communities at Diablo Canyon will be similar to that at Morro Bay, where an increase in warm water tolerant forms was observed in the small transition area". We agree that there will be a replacement in the transition zone; however, many species listed in Table 5.18 for Morro Bay were not found at the Diablo Canyon site. This was true not only for benthic species, but also for fish and algae. For example, not one species of *Sebastes* was listed in Table 5.18 for Morro Bay, while at Diablo *Sebastes* were the most abundant. Several of the more important brown algae, serving as food for abalone, were not found at Morro Bay. The difference between the two sites and the possibility of different types of impacts should be recognized.

The last paragraph on Page 5-34 gives the impression that Burge and Schultz suggested that intermediate depths from 10 to 50 feet might be the most important for red abalone. This was not true. Burge and Schultz suggested that the nearshore area from 0 to 20 feet was the most important area for the red abalone and that smaller beds were found in depths of 20 to 50 feet. It should be noted that Station 16 was representative of the 5- to 10-foot zone.

Page 5-39, Paragraph 2. In discussing the loss of 70,000 abalone from the cove, we assume this estimate was based on transect data of visible abalone. Juveniles and those hidden from view could increase this estimate substantially. In addition, this estimate was based on the assumption that half the cove would be altered. If the entire cove were altered, losses would be considerably greater. Additional thermal plume projections should be done to provide information for assessment of the impact of the cove and adjacent areas.

This projected loss only considers direct mortality from high temperature and losses through reduction in algae. Other aspects, such as the effect on reproduction or physiology, have not been considered.



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Page 5-41, Item: Fish, (a) Fish Eggs and Larvae. The use of data from CalCOFI stations to compare with Diablo Cove can be questioned. Because CalCOFI stations are offshore stations, the species involved would be different. A comparison of Tables 5.20 and 5.21 shows that the northern anchovy is the only directly comparable species. While *Sebastes* are common to both, the larval fish from the open ocean station may be species inhabiting the deeper waters. Most of the *Sebastes* listed for the Diablo area spawn nearshore. In addition to *Sebastes*, which produce live young, others such as the cabezon have adhesive eggs that attach to nearshore rocks. Direct qualitative and quantitative comparisons cannot be made between the nearshore and offshore areas.

In addition, we question the mortality figures for entrainment based on the estimates of zooplankton. Eggs and larvae of fish are softer than crustacean zooplankton. Mortality from abrasion, turbulence, or changes in pressure would be much greater for the softer forms. A recent study indicated that survival of entrained young fish was zero at 30°C, while at temperatures of 25°C, and 22°C, 50 percent and 35 percent mortalities were recorded. (Marcy, B. C., Jr., 1971, "Survival of Young Fish in the Discharge Canal of a Nuclear Power Plant, J. Fish Res. Bd. Canada, 28: 1057-1060.)

We do not agree with the evaluation of the expected loss of larval fish as presented. The impact on eggs and larvae of fish could be much greater and may affect recruitment to local populations of fish in the Diablo Canyon area. Onsite studies on entrainment will be necessary in order to adequately assess the losses. The discharge plume may also alter the nearshore nursery areas for some species. We recommend that this entire section be reevaluated.

Page 5-43, Item: Fish, (b) Juvenile and Adults. The reference to the species in Table 5.22 as being representative of those at Diablo Canyon (Table 5.21) is not true. The thermal tolerance of the species at Diablo Cove has not been evaluated. For example, nine species of *Sebastes* were listed from Diablo Canyon while the only *Sebastes* species in Table 5.22 was not found at Diablo Canyon. A comparison of the two lists shows few similarities, and it should be recognized that the thermal tolerances for species in the Diablo area are not known.

Some adverse effects would be expected through the entrainment of small fish able to pass through the intake screen. (Reference is again made to Marcy, 1971.)

A reference to the statement that jacksmelt would become more abundant should be given. This species is not presently found in the area, and other species might be expected to become more abundant than jacksmelt. Those attracted to the Morro Bay discharge (Table 5.18) should be considered for the Diablo Canyon area.

Page 5-43, Item: Heat Treatment for Defouling the Conduits. We would like clarification and documentation on the expected loss of "3.57 x 10³ lb/yr of zooplankton and 5.9 x 10⁶ larval fish/yr within the cove", and on how these values were derived.



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Page 5-48, Item: Mechanical Effects. Documentation is needed for the statement that "losses less than 10 pounds per year will result from mechanical damage at the intake". Differences in swimming ability should be considered when making estimates using data from other powerplants. Anadromous fish may be more successful in escaping intake velocities than many nearshore marine fish. Mortalities for nearshore marine fish could be higher than the estimate presented.

Page 6-2, Item: Preoperational Aquatic Surveys. We do not feel that all the studies have been adequate to provide baseline information or predictive assessments. Additional work should be done on the effects of current direction, winds, and tidal influence on the predicted plume areas. This information is necessary in order to adequately assess the expected environmental impact.

The biological baseline information is adequate for providing the relative abundance of animals. Postoperational monitoring will only determine gross effects such as the disappearance of species. The more subtle effects, such as changes in food habits, growth, or reproduction, cannot be assessed without additional baseline information on life history and biology of the species in the area. This should be recognized in the Statement.

Page 6-2, Item: Studies Planned by California Fish and Game. The studies performed by California Fish and Game can provide a relative baseline and can be used as indices for gross changes induced by plant operation. However, these studies did not define the population sizes of the major sport and commercial species. This section should be revised accordingly.

Page 6-7, Item: Operational Thermal and Chemical Monitoring Programs. Unless this is related to chlorine, we would like more information on the pH of the discharge during chemical cleaning of equipment. No mention was made in the statement on this aspect of the operation and on the chemicals to be used, other than chlorine.

A monitoring program for heavy metals in the environment associated with the discharge should be included. This program should mention uptake by both plants and animals. Background levels should be determined prior to operational start-up.

Page 10-3, Item: Biological Resources. We do not agree with the statement that "In general, the effect on biological resources is too small to regard any of them as committed". There will be a definite commitment of resources as a result of the project, and these should be recognized. The loss of abalone and other species in the cove has been mentioned. Mortalities through entrainment, heat treatment, and addition of chemicals have been recognized and should be stated as a commitment of resources. Because the purpose of the environmental impact statement is to assess the impact of the project, resource commitments should be considered, regardless of their magnitude.



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Page 13-10, Item: Costs - Environmental. The assessment of environmental costs was a judgment based on the conclusions arrived at in the Statement. The impression given in the Statement was that these conclusions were based on well-studied impacts and adequate information. In many instances, this has not been the case. The environmental cost of the breakwater construction should be revised. The loss of abalone and other species should be recognized. We also feel that the comparisons and data presented on the impact of entrainment, heat treatment, and addition of chemicals, were not adequate to conclude that these would not have serious consequences to the environment.



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