Central Watershed Unit Concerns	Responses
1. The proposed plan does not describe a process for agency approval of the calculations and variables used to assess impacts from impingement and entrainment.	By approving the MLMP, the Coastal Commission has already approved the calculations and variables used to assess impacts from impingement and entrainment. Now that the MLMP is before the Regional Board, the Board has the same opportunity to approve the Plan's entrainment and impingement assessment.
2. The proposed mitigation process does not clearly identify the method for the final selection and agency concurrence of the preferred mitigation alternative.	The MLMP clearly identifies the methods by which the mitigation site(s) will be selected, subject to agency approval. Poseidon must choose up to two sites from among eleven designated sites in the southern California Bight. Poseidon's selection(s) must meet the minimum standards (set forth in § 3.1) and best meet the objectives (set forth in § 3.2). The MLMP also retains agency authority to approve the proposed restoration plan for the mitigation sites.
3. There is insufficient sampling data to accurately determine the impacts of impingement and entrainment.	Section IV of the Comment Letter explains that Poseidon's impingement and entrainment sampling data are technically sound for the following reasons: a. The sampling data come from a study that was conducted by Tenera Consultants ("Tenera") for the Encina Power Station (EPS) pursuant to EPA's 316(b) regulations. Tenera's collected samples for EPS"s "Impingement Mortality and Entrainment Characterization" ("IM&E") Study in conformity with criteria that were set forth in the "Study Plan" that the Regional Board reviewed and approved in 2004 (see Comment § IV.2). All of the data generated pursuant to this Board-approved Study and which form the basis for the impingement and entrainment analyses are in the Regional Board's possession. *See, e.g.*,, "Minimization Plan" Attachments 2-5 and "Clean Water Act Section 316(b) Impingement Mortality and Entrainment Characterization Study- Effects on the Biological Resources of Agua Hedionda Lagoon and the Nearshore Ocean Environment (January 2008)" b. Pursuant to Condition 8 of Poseidon's Coastal Development Permit, Poseidon submitted the Encina data to the Coastal Commission where it was again reviewed and endorsed through a peer review processed by Dr. Pete Raimondi, recognized by the Commission as California's leading expert on entrainment analysis. c. All of the data upon which Dr. Raimondi relied to conclude that Tenera conducted the study "very well" is before the Regional Board as part of this administrative record. d. The relatively heavy rains of 2004-2005 did not skew the sampling data. ➢ As Dr. Scott Jenkins explained at the Regional Board's April 9, 2008 meeting on Poseidon's Minimization Plan, the heaviest rains in 2005 only slightly depressed salinity levels from 33.52 ppt under dry conditions to at most 30.75 ppt during peak storm runoff (lasting for a period of 2.6 days) (*see* Dr. Jenkins' Declaration). ➢ Such a slight depression in the lagoon's salinity levels during peak storm runoff

Central Watershed Unit Concerns	Responses
	would not materially affect the marine species mix over the period of the data collection effort. Therefore, the E&I study did not under-represent the number or density of marine organisms in the lagoon, nor did it underestimate the extent of CDP's potential impacts (*see* Dr. Mayer Declaration § V.F.1). e. The calculational methodologies and conclusions used to estimate proportional mortality (Pm) and Area of Production Foregone (APF) are insensitive to annual variations in larval fish populations.
4. The proposed process seems to favor a pre-determined outcome (i.e. mitigation in San Dieguito Lagoon). Other mitigation alternatives (e.g. kelp bed enhancement and artificial reef construction) should be considered and evaluated equally as viable mitigation possibilities.	As part of the interagency process, many potential mitigation alternatives and sites were examined, resulting in the identification of 11 pre-approved sites in the MLMP. Regional Board staff urged Poseidon to consider multiple sites and Poseidon has acted upon this recommendation (*see* Comment § VII.5). The MLMP does not identify any single pre-determined mitigation site, but rather a slate of sites, selection from among which requires agency approval.

Responses to Regional Board's February 19, 2008 Letter Regarding
Poseidon's Flow, Entrainment & Impingement Minimization Plan Draft #2 (submitted June 29, 2007)

Board's 02/19/08 Criticisms of Plan Draft #2	Response
1. The Plan does not yet integrate all the elements of the statutory requirements of California Water Code (CWC) Section 13142. The proposed project only includes "mitigation", while the statute CWC Section 13142.5(b) also requires that dischargers implement best available technology and mitigation measures. The Plan does not appear to include technology measures for the intake structure to reduce impingement and entrainment (I&E).	Water Code Section 13142.5(b) requires industrial facilities using seawater for processing to use the best available site, design, technology, and mitigation feasible to minimize impacts to marine life. The Minimization Plan was revised and resubmitted March 7, 2008. The revisions include individual chapters, addressing each component – site (Chp 2), design (Chp 3), technology (Chp 4), and mitigation individually (Chp 6. The Minimization Plan was approved in this form April 9, 2008, conditioned upon Poseidon's submittal of a mitigation plan, which takes the form of the MLMP. Therefore, all of these items have been addressed.
2. The Plan provides an evaluation of impacts based upon one year of data, 2004-05 with record rainfall, but does not explicitly evaluate the on-going impacts from Poseidon's operations.	The heaviest rains in 2005 only slightly depressed salinity levels from 33.52 ppt under dry conditions to at most 30.75 ppt during peak storm runoff (lasting for a period of 2.6 days) (*see* Jenkins's Declaration). Such a slight depression in the lagoon's salinity levels during peak storm runoff would not materially affect the marine species mix over the period of the data collection effort (*see* Dr. Mayer's Declaration). Therefore, the E&I study did not under-represent the number or density of marine organisms in the lagoon, nor did it underestimate the extent of CDP's potential impacts.
3. The Carlsbad desalination project's (CDP) listing of impacts appears to omit specific impacts to target invertebrates.	In "EPS's Proposal for Information Gathering" (Attachment 2 to the revised Minimization Plan), Tenera Environmental ("Tenera") notes that Rock crab megalopal larvae (Cancer sppp) and California spiny lobster phyllosoma larvae (Panulirus interruptus) are "target invertebrates." The requested information has been included in Attachments 2 and 5 of the revised Plan. Impingement results with respect to these and other invertebrates are included in Attachment 2 to the revised Minimization Plan (submitted to the Regional Board March 7, 2008 and conditionally approved April 9, 2008). Entrainment results are included in Attachment 5.
4. The proposed mitigation project does not appear to account for all pertinent impacts resulting from impingement of invertebrates, entrainment of invertebrates, discharges of brine, etc.	By requiring the mitigation of up to 55.4 acres, the MLMP actually over-accounts for all pertinent impingement and entrainment impacts. ➢ As described in Poseidon's Comment § V, the Project's impingement impacts will be de minimis and even further reduced by technology (e.g., variable frequency drives). ➢ As described in Comment § VI, the Empirical Transport Model (ETM results in the MLMP are based on a number of conservative assumptions.

5. The CHREP did not identify and evaluate the possible mitigation projects located within the same watershed, prior to proposing the out of watershed mitigation in San Dieguito Lagoon. The best mitigation for impacting the lagoon would be to replace lost functions by restoring current upland acreage to the historic wetland condition, or by creating new wetlands where there were none historically.	During the interagency process, the Executive Officer indicated that Agua Hedionda Lagoon is not a preferred mitigation site. The MLMP, however, includes Agua Hedionda Lagoon among the list of 11 pre-approved sites.
6. The proposed mitigation ratio of 1.1:1.0 isn't fully supported. The Plan should be revised to include an evaluation of other mitigation options that may be available within the watershed. The proposed mitigation ratio appears inadequate in light of several factors generally considered by the Regional Board:	Experts in the field of entrainment analysis customarily apply a 50% confidence level APF and then apply no mitigation ratio (Dr. Mayer's Declaration, § 5.E). However, when he reviewed Tenera's ETM Calculations for the California Coastal Commission, Dr. Raimondi applied an 80% confidence level APF as the basis for mitigation. This approach represents a significant departure from the way that entrainment studies have been conducted in the past and is much more conservative than the customary/traditional method. Since the MLMP is based on Dr. Raimondi's conservative entrainment analysis, it imposes a mitigation requirement of up to 55.4 acres, which will that impingement and entrainment have been fully offset. Mitigation success is further assured by the MLMP's stringent performance criteria.
a. The proposed mitigation project is located within a different watershed (the San Dieguito Lagoon) instead of the Agua Hedionda Lagoon. A higher ratio may be appropriate for this project because the referenced mitigation project is out-of-kind (i.e., discharger is not actually replacing the lost resources and functions).	The mitigation site(s) have not yet been selected. The basis for selection of the mitigation site(s) is prescribed in the MLMP in detail (Section 3). Among the minimum standards set forth in Section 3.1, the MLMP provides that the mitigation project must restore habitat "similar to the affected habitats in Agua Hedionda Lagoon." This means that Poseidon will restore tidally-influenced salt marsh or shallow water areas—areas that produce or support the affected entrained organisms. Therefore, whether or not the project is ultimately located within the same watershed (which, indeed, it may be given that Agua Hedionda Lagoon is one of eleven sites identified in MLMP § 2), Poseidon's mitigation efforts will actually replace the same types of organisms impacted by CDP's operations.
b. It is not clear that the proposed one-time mitigation is adequate to compensate for the long-term ongoing impacts to beneficial uses, resources, and functions present in Agua Hedionda Lagoon.	One-time mitigation is no longer being proposed. Poseidon is committed to implementing the terms of the MLMP. As set forth in the MLMP § 5.0, Poseidon's restoration plan will be a long-term project in which Poseidon will conduct "[m]onitoring, management (including maintenance), and remediation…over the 'full operating life' of Poseidon's desalination facility…[for] 30 years from the date 'as built' plans are submitted…." Poseidon's efforts will be enforced by agency review.
c. The mitigation project is for restoration of coastal wetland habitat, rather than the lagoon habitat impacted by the	As noted in response to Question 6(a) above, Poseidon's mitigation project will restore habitat "similar to the affected habitats in Agua Hedionda

operation of the CDP.	Lagoon." (MLMP § 3.1) In so doing, the project will provide measurable long term environmental benefits adequate to fully mitigate unavoidable impingement and entrainment impacts associated with CDP operations. Regardless of whether the project is ultimately located within the same watershed (which, indeed, it may be given that Agua Hedionda Lagoon is one of eleven sites identified in MLMP § 2), Poseidon's mitigation efforts will replace the same organisms impacted by CDP's operations.
7. Poseidon might benefit from convening a joint meeting with the resources agencies (including California Dept Fish and Game, US Fish and Wildlife Service, Army Corps of Engineers, National Marine Fisheries) to discuss the impacts to beneficial uses, resources, and functions by the proposed project, and on the preferred mitigation project so they can discuss agency concerns/comments.	As described in Comment § II.E, in developing the MLMP, Poseidon acted upon the recommendations of Regional Board staff and convened a joint meeting with a number of resource agencies. Of the thirteen state and federal agencies that Poseidon invited to attend its interagency working group meeting on May 1, 2008, a number of agencies ended up participating, including the Regional Board, California Department of Fish and Game, California Department of Transportation, California State Lands Commission, City of Carlsbad, City of Vista, and U.S. Fish and Wildlife Service. In addition, agency comments and concerns were specifically requested on the draft MLMP. As a result, the MLMP represents a consensus effort among several agencies.
8. The assessment should address the seasonal and/or daily variations in impingement impacts.	CDP's impingement impacts will be *de minimis* and even further reduced by technology (see Comment § V). Nevertheless, to the extent that the Board staff wants to assess seasonal variations in these *de minimis* impacts, Poseidon has made these data available. When Poseidon submitted its revised Minimization Plan to the Regional Board in March 2008 for the Board's April 9th approval, Poseidon included Attachment 2—a report that lists weekly impingement totals from the 2004-2005 Tenera study.
9. The assessment needs to include results of an impingement study for target invertebrates. Table 3.2 includes only results for fish during 2004-05.	In "EPS's Proposal for Information Gathering," Tenera notes that Rock crab megalopal larvae (Cancer sppp) and California spiny lobster phyllosoma larvae (Panulirus interruptus) are "target invertebrates." Impingement results with respect to these and other invertebrates are included in Attachment 2 to the revised Minimization Plan (submitted to the Regional Board March 7, 2008 and conditionally approved April 9, 2008).
10. The assessment states that: "The total amount of impinged organisms for the individual sampling events is presented in Table 3-2" (p.19). The Plan, however, does not clearly identify individual sampling events. The interpretation of the results is hampered by the absence of a presentation of results for impinged organisms (including invertebrates) with dates, times, and flow rates of sampling events.	Attachment 2 to the revised Minimization Plan includes the requested information. This Plan was submitted to the Regional Board March 7, 2008 and conditionally approved April 9, 2008.
11. The assessment states that, "The daily biomass of impinged	In response to Staff's request, Poseidon has revised the estimate of its daily

fish during normal operations is 0.96 kgs/day (1.92 lbs/day) for an intake flow of 304 MGD" (p.19). The text discussion should clarify how this figure is determined and how the total impingement results were adjusted to an intake flow of 304 MGD. Also, there is a conversion discrepancy since 0.96 kgs converts to 2.12 lbs, not 1.92 lbs as indicated in the Plan.	impingement impacts. Poseidon's revised impingement assessment is based on the analysis of the most recent data that Tenera Consultants collected at the Encina intake facilities during the period June 1, 2004 to May 31, 2005. Although Tenera initially collected the data for Encina, Tenera has been able to use these data to project the impingement impacts that will be associated with the Project's standalone operations. To isolate the impingement impacts associated with the Project's stand-alone intake operations, Tenera conducted a regression analysis that factored in Encina's historical flow rates and impingement effects (see Comment § V). Whereas Encina's average intake flow during the 2004/2005 sampling period was 632.6 MGD, the Project's maximum intake flow will be only 304 MGD. Because the Project's flow volumes will be less than Encina's, its impingement impacts are also proportionally less than the Project's projected impacts. Using the statistically significant relationship between the impingement effects and flows measured under normal power plant operations that occurred during the June 2004 to June 2005 impingement survey, Tenera concluded that the Project's stand-alone operations will result in an average daily impingement effect of 1.56 kg (3.45 lbs), not 0.96 kg as previously estimated. This amount is nevertheless *de minimis*, and will be further reduced by technological measures.
12. The assessment of impacts from entrainment assessment appears to include larval fish but does not clearly include impacts to fish eggs and invertebrates. It is the understanding of the Regional Board that the 2004-05 study was to include monitoring of (at least) entrained Cancer crab megalops and lobster larvae, but the assessment does not appear to include these data. Also, it is unclear that sampling followed a protocol approved by the Regional Board as stated (p.22).	The study was conducted according to sampling protocol reviewed and approved by the Regional Board. Prior to approving the study plan, the Board engaged an outside, independent consultant Tetra Tech under contract and funded by the EPA, to review and Comment on the plan. The Board's consultant suggested a number of changes that were accepted and incorporated in the final Board-approved study plan and protocol. The approved protocol, including sampling and sample processing methods and techniques of data analysis and modeling to assess intake effects were followed as described in the final protocol. A copy of the final protocol has been included as Attachment 3 of the revised Minimization Plan. The final results of EPS's 316(b) study were published in January 2008.
13. The Plan does not clearly identify the supporting data or an explanation of underlying assumptions and calculations that were used to estimate proportional mortality values for larval fish as presented (p.23) in the Plan. Therefore, the Regional Board could not objectively evaluate the validity of the estimated proportional entrainment mortality (12.2%)	Section 5.3 of the revised Minimization Plan ("Methodology for Assessment of Entrainment Impact") clearly identifies the supporting data. These data are provided in Attachments 3-5 of the Minimization Plan, and explain the underlying assumptions and calculations that were used to estimate proportional mortality values for larval fish. The mitigation requirements set forth in the MLMP are based on these data.

presented in the Plan.	
14. Impacts are based upon the few most commonly entrained (most abundant) species. It is unclear how much more severe impacts may be when populations are small.	The entrainment model can be applied to any species that is collected in entrainment samples—whether it is abundant or rarely collected. However, since the level of confidence and ability to reach any meaningful conclusion about entrainment effects on the species' population diminishes with the number of specimens in a sample, Poseidon's decision to use abundant species is based on statistical principles. The abundances (densities) of all of the larval fish species collected in Tenera's entrainment surveys are included in the entrainment study reports. Nevertheless, Tenera only analyzes entrainment effects on species that yield meaningful results (i.e., the most commonly entrained species). As an expert in this field, Dr. Mayer has used this approach in entrainment study analyses with ETM modeling, as well as in fecundity hindcast (FH) and adult equivalent loss model analyses (see Comment § VI.2).
15. The Regional Board has the following comments regarding the estimated number of lagoon acres impacted, as presented in the plan since:	
a. The estimate of the number of lagoon acres used by the three most commonly entrained species is based on a 2000 Coastal Conservancy Inventory (Table 4-2, p.23). It is unclear if this document is accurate or appropriate for the purpose of determining such an important component of the area of habitat production forgone (APF). The reference document (Attachment 4, Table 2), includes the footnote caveat "... This information is not suitable for any regulatory purpose and should not be the basis for any determination relating to impact assessment or mitigation." An accurate delineation of lagoon habitats should be used for this critical component of the APF.	The APF was calculated using standard protocol and was independently verified by Dr. Raimondi and the Coastal Commission's Scientific Advisory Panel.
b. The estimate of the number of lagoon acres used by the three most commonly entrained species appears to exclude salt marsh and brackish/freshwater acreage (p.23). Excluding these intertidal habitats may result in the analysis underestimating this component of the APF.	The areas of Agua Hedionda Lagoon that have the potential to be impacted by the CDP operations are those habitats occupied by the three most commonly entrained lagoon fish larvae (98% of the fish larvae that would be entrained by the CDP stand-alone operations are globies, blennies and hypsopops). These habitats include 49 acres of mudflat/tidal channel and 253 acres of open water. Experts in the field of entrainment analysis agree that it is not appropriate to include other lagoon habitats in the APF calculation (e.g., brackish/freshwater, riparian, salt marsh or upland habitats) that are not

	occupied by the impacted species (see Dr. Mayer's Declaration, § VI.3). Note that Dr. Raimondi and the Coastal Commission independently endorsed the decision to limit the source water body value to the 302 areas consisting of the most commonly entrained species.
c. The calculation of the APF (p.23) appears to use values for mortality and lagoon acreage that are not fully supported.	In Section 5.3 of the revised Minimization Plan, Poseidon provided a detailed analysis of APF and mortality values. The data that were used in calculating these values were made available in Attachments 3-5 to the Plan. Upon reviewing Tenera's entrainment analysis for the California Coastal Commission, Dr. Raimondi proposed two significant modifications (i.e., accounting for ocean species, using an 80% confidence level) that, when layered upon the many conservative assumptions already underlying the analysis, ensure that the Project's entrainment impacts will be fully mitigated.
d. The text should be revised to include a clear explanation of how the estimated lagoon acreage for commonly entrained species was adjusted to include only impacts associated with operations of CDP, rather than impacts from operation of the Encina Power Station.	The process of translating the entrainment data also was relatively simple because entrainment impacts are directly proportional to flow through the intake. Tenera simply divided CDP's projected flow rate (i.e., 304 MGD) by CDP's average flow rate over the sampling period to calculate a proportional flow rate. For instance, if EPS's average flow rate over a given time period was 608 MGD, then CDP's proportional flow rate for that period would have been 50% (304/608). Tenera would then multiply CDP's proportional flow rate (50% in this example) by EPS's entrainment impact over that time period. So, for example, if Tenera had estimated that EPS had entrained 1000 organisms during the time period, then Tenera would have applied the 50% value to determine that CDP's operations would have entrained 500 organisms (see Dr. Mayer's Declaration, § V.C.2).
16. The evaluation concludes that the small fraction of marine organisms lost to entrainment would have "no effect on the species' ability to sustain their population" and goes on to describe the natural rates of high mortality (p. 24). But the argument that that there are "excess" larvae appears to omit an important consideration. Besides contributing to marine food webs, the naturally high production of larvae serves as a buffer against catastrophic and cumulative impacts to populations. These are important 'ecological services' that must not be taken lightly or given away without adequate mitigation.	Comment noted. This language was removed from the revised Minimization Plan and not included in the MLMP. The MLMP provides for the mitigation of all entrainment effects.
17. The Regional Board prefers that the evaluation of the impact be presented as a rate (loss of x-amount of organisms per year,	Whereas an early version (#2) of the Minimization Plan established a scenario by which Poseidon would make certain fixed annual monetary

or impact/year). The proposed mitigation is a fixed amount ($3 to $4 million). It seems unlikely that a fixed amount would adequately compensate for a loss that is a rate over multiple, future years. It appears more likely that a proposed fixed amount really only accounts for mitigation for just one year of operation. The Regional Board may find a fixed amount to be acceptable, provided that:	contributions to fund restoration projects in the Project's vicinity, the revised Minimization Plan and the MLMP have abandoned this concept. Therefore, the following two questions are now moot.
a. The average annual impact could be reasonably determined and reasonably translated into a dollar amount, and that amount (or correct share) is paid every year of operation - but that is not what is proposed in the Plan or the CHREP.	This issue is moot now that Poseidon has abandoned its contribution plan.
b. A fixed amount might also be reasonable if the CDP mitigates its share by increasing lagoon acreage via restoration or creation. Such in-kind litigation would (if functional) replace the productivity lost to the operation of the COP, and the impact would be fully mitigated.	This issue is moot now that Poseidon has abandoned its contribution plan.