



# State Water Resources Control Board



**Linda S. Adams**  
*Secretary for  
Environmental Protection*

**Division of Water Quality**  
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**Arnold Schwarzenegger**  
*Governor*

October 1, 2010

Mr. Lester Snow  
Secretary for Resources  
California Resources Agency  
1416 Ninth Street, Suite 1311  
Sacramento, California 95814

Dear Mr. Snow:

## SUBMITTAL OF THE NOTICE OF DECISION FOR A POLICY ON THE USE OF COASTAL AND ESTUARINE WATERS FOR POWER PLANT COOLING

On May 4, 2010, the State Water Resources Control Board (State Water Board) adopted the statewide "Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling" (Policy) under Resolution No. 2010-0020. The Policy establishes uniform, technology-based standards to implement federal Clean Water Act section 316(b), which requires that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact. The Policy was approved by the Office of Administrative Law (OAL) on September 27, 2010.

The State Water Board's planning process has been certified as "functionally equivalent" under section 21080.5 of the California Environmental Quality Act (CEQA). Completion of the CEQA process involves the submittal of CEQA document filing fees with the Department of Fish and Game and subsequently filing of a "Notice of Decision" (rather than a "Notice of Determination") with the California Resources Agency. Filing fees in the amount of \$949.50 has been submitted separately to the Accounting Services Branch of the Department of Fish and Game (please see the attached signed disbursement voucher and receipt).

The attached Notice of Decision for State Water Board Resolution No. 2010-0020 is hereby filed with the California Resources Agency. Resolution No. 2010-0020 and the CEQA checklist for the project are included in the package.

If you have any questions regarding this submittal, you may contact me at (916) 341-5302 (email: [vwhitney@waterboards.ca.gov](mailto:vwhitney@waterboards.ca.gov)). You may also contact Joanna

***California Environmental Protection Agency***

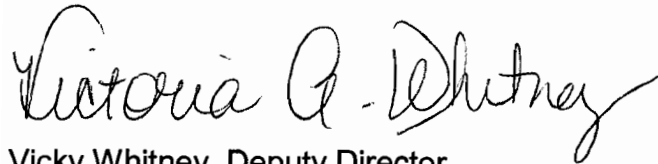
Addressee

- 2 -

Date

Jensen at (916) 341-5582 (email: [jjensen@waterboards.ca.gov](mailto:jjensen@waterboards.ca.gov)), who is the lead staff on this matter.

Sincerely,



Vicky Whitney, Deputy Director  
Division of Water Quality

Enclosures (2)

## Notice of Decision

**TO:** Lester Snow  
Secretary for Resources  
Resources Agency  
1416 Ninth Street, Suite 1311  
Sacramento, California 95814

**FROM:** State Water Resources Control Board (State Water Board)  
1001 I Street, Sacramento, CA 95814

**SUBJECT:** Filing of Notice of Decision in compliance with section 21080.5  
of the Public Resources Code

**PROJECT TITLE:** Water Quality Control Policy on the Use of Coastal and Estuarine  
Waters for Power Plant Cooling

**LOCATION:** California Coastal and Estuarine Areas

**DESCRIPTION:** State Water Board Resolution No. 2010-0020 (see Attachment A)  
establishes uniform, technology-based standards to implement  
federal Clean Water Act section 316(b), which requires that the  
location, design, construction, and capacity of cooling water intake  
structures reflect the best technology available for minimizing  
adverse environmental impact.

**CONTACT PERSON:** Joanna Jensen at (916) 341-5582  
(email: [jjensen@waterboards.ca.gov](mailto:jjensen@waterboards.ca.gov))

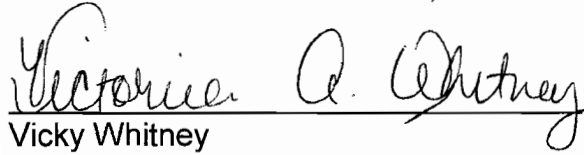
This Notice of Decision is to advise that the State Water Board has determined that Resolution No. 2010-0020, adopted on May 4, 2010, has been fully approved. The amendment was approved by the California Office of Administrative Law on September 27, 2010 (see Attachment B for the approval letter).

The State Water Board has made the following determinations regarding the above-referenced project:

1. The State Water Board found that the project would have a less than significant effect on the environment, if mitigated, after evaluating impacts, alternatives and mitigation measures (see Attachment C for the CEQA Checklist).
2. A substitute equivalent document was prepared for this project pursuant to the provisions of CEQA (see the State Water Board's web page at [http://www.waterboards.ca.gov/water\\_issues/programs/npdes/cwa316.shtml](http://www.waterboards.ca.gov/water_issues/programs/npdes/cwa316.shtml) ).
3. A statement of overriding considerations was not adopted for this project.
4. Findings were made pursuant to the provisions of CEQA.

## Notice of Decision

This is to certify that the final environmental document, with comments and responses and record of project approval, is available to the general public at the State Water Board's office at 1001 I Street, Sacramento, CA 95814.

  
Victoria A. Whitney

Vicky Whitney  
Deputy Director  
Division of Water Quality  
State Water Resources Control Board

10/1/10

Date

Date received for filing: \_\_\_\_\_

**STATEWIDE WATER QUALITY CONTROL POLICY ON THE USE OF COASTAL  
AND ESTUARINE WATERS FOR POWER PLANT COOLING**

1. Introduction

- A. Clean Water Act Section 316(b) requires that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available (BTA) for minimizing adverse environmental impact. Section 316(b) is implemented through National Pollutant Discharge Elimination System (NPDES) permits, issued pursuant to Clean Water Act Section 402, which authorize the point source discharge of pollutants to navigable waters.
- B. The State Water Resources Control Board (State Water Board) is designated as the state water pollution control agency for all purposes stated in the Clean Water Act.
- C. The State Water Board and Regional Water Quality Control Boards (Regional Water Boards) (collectively Water Boards) are authorized to issue NPDES permits to point source dischargers in California.
- D. Currently, there are no applicable nationwide standards implementing Section 316(b) for *existing power plants*<sup>1</sup>. Consequently, the Water Boards must implement Section 316(b) on a case-by-case basis, using best professional judgment.
- E. The State Water Board is responsible for adopting state policy for water quality control, which may consist of water quality principles, guidelines, and objectives deemed essential for water quality control.
- F. This Policy establishes requirements for the implementation of Section 316(b), using best professional judgment in determining BTA for cooling water intake structures at existing coastal and estuarine power plants that must be implemented in NPDES permits.
- G. The intent of this Policy is to ensure that the beneficial uses of the State's coastal and estuarine waters are protected while also ensuring that the electrical power needs essential for the welfare of the citizens of the State are met. The State Water Board recognizes it is necessary to develop replacement infrastructure to maintain electric reliability in order to implement this Policy and in developing this policy considered costs, including costs of compliance, consistent with state and federal law.

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<sup>1</sup> An asterisk indicates that the term is defined in Section 5 of the Policy.

- H. During the development of this Policy, State Water Board staff has met regularly with representatives from the California Energy Commission (CEC), California Public Utilities Commission (CPUC), California Coastal Commission (CCC), California State Lands Commission (SLC), California Air Resources Board (ARB), and California Independent System Operator (CAISO) to develop realistic implementation plans and schedules for this Policy that will not cause disruption in the State's electrical power supply. The compliance dates for this Policy were developed considering a report produced by the energy agencies (CEC, CPUC, and CAISO), titled "Implementation of OTC Mitigation Through Energy Infrastructure Planning and Procurement Changes", and the accompanying table, titled "Draft Infrastructure Replacement Milestones and Compliance Dates for Existing Power Plants in California Using Once Through Cooling", included in the Substitute Environmental Document for this Policy. The energy agencies' approach seeks to address the replacement, repowering, or retirement of power plants currently using OTC that (1) maintains reliability of the electric system; (2) meets California's environmental policy goals; and (3) achieves these goals through effective long-term planning for transmission, generation and demand resources. The energy agencies have stated that the dates specified in their report may require periodic updates.
- I. To prevent disruption in the State's electrical power supply when the Policy is implemented, the State Water Board will convene a Statewide Advisory Committee on Cooling Water Intake Structures (SACCWIS), which will include representatives from the CEC, CPUC, CAISO, CCC, SLC, ARB, and State Water Board. SACCWIS will review implementation plans and schedules submitted by dischargers pursuant to this Policy, and advise the State Water Board on the implementation of this Policy to ensure that the implementation schedule takes into account local area and grid reliability, including permitting constraints. The State Water Board recognizes the compliance dates in this Policy may require amendment based on, among other factors, the need to maintain reliability of the electric system as determined by the energy agencies included in the SACCWIS, acting according to their individual or shared responsibilities. The State Water Board retains the final authority over changes to the adopted policy.
- J. While the CEC, CPUC and CAISO each have various planning or permitting responsibilities important to this effort, the approach relies upon use of competitive procurement and forward contracting mechanisms implemented by the CPUC in order to identify low cost solutions for most OTC power plants. The CPUC has authority to order the investor-owned utilities (IOUs) to procure new or repowered fossil-fueled generation for system and/or local reliability in the Long-Term Procurement Plan (LTPP) proceeding. In response to the Policy, the CPUC anticipates modifying its LTPP proceeding and procurement processes to require the IOUs to assess replacement infrastructure needs and conduct targeted requests for offers (RFOs) to acquire replacement, repowered or otherwise compliant generation capacity. LTPP proceedings are conducted on a biennial cycle and plans are normally approved in odd-numbered years. The next cycle,

the 2010 LTPP, is estimated to result in a decision by 2011. The subsequent cycle, the 2012 LTPP, would in turn result in a decision by 2013. Once authorized to procure by a CPUC LTPP decision, the IOUs need approximately 18 months to issue an RFO, sign contracts, and submit applications to the CPUC for approval. Approval by the CPUC takes approximately nine months. If the contract involves a facility already licensed through the CEC generation permitting process, then financing and construction can begin. A typical generation permitting timeline is 12 months, but specific issues such as ability to obtain air permits can delay the process. IOUs often give preference to RFO bids with permits already (or nearly) in place. From contract approval, construction usually takes three years, if generation permits are approved, or approximately five years, if generation permits are pending or other barriers present delays. In total, starting from the initiation of an LTPP proceeding (2010 LTPP or 2012 LTPP), seven years are expected to elapse, before replacement infrastructure is operational. Due to the number of plants affected, efforts to replace or repower OTC power plants would need to be phased.

- K. Because the Los Angeles region presents a more complex and challenging set of issues, it is anticipated that more time would be needed to study and implement replacement infrastructure solutions. Therefore, total elapsed time is expected to begin in 2010 and end in 2017 for the Greater Bay Area and San Diego regions, which would be addressed beginning in the 2010 LTPP. For the Los Angeles region, which would be addressed beginning in the 2012 LTPP, total elapsed time is expected to begin in 2012 and end in 2020. A transmission solution is expected to have approximately the same timeframe, but could be delayed by greater potential for significant local opposition. In order to assure that repowering or *new power plant*\* development in the Los Angeles basin addresses unique permitting challenges, the SACCWIS will assist the State Water Board in evaluating schedules for power plants not under the jurisdiction of the CPUC or operating within the CAISO Balancing Authority Area.
- L. The Global Warming Solutions Act of 2006 requires California to reduce greenhouse gas emissions to 1990 levels by 2020 and then to maintain those reductions. California presently has two *nuclear-fueled power plants*\* that provide approximately 4,600 megawatts of baseload electricity and do not emit greenhouse gases during energy generation. Energy generation by facilities that do not emit greenhouse gases will be critical to meeting the mandates of the Global Warming Solutions Act and emerging national and international greenhouse gas reduction requirements. The *nuclear-fueled power plants*\* are entering into United States Nuclear Regulatory Commission (Commission) license renewal proceedings unique to the nuclear power industry and relicensing may extend the plants operating lives to approximately 2045. Unlike older era fossil-fueled plants, if the *nuclear-fueled power plants*\* undergo modernization as part of relicensing or cooling structure upgrades, that modernization will not reduce greenhouse gas emissions, and in fact, extended downtime during modernization may result in short-term increases in greenhouse gases as other greenhouse gas emitting

facilities provide makeup power. In recognition of these considerations and others, this Policy requires special studies for the *nuclear-fueled power plants\** to address their unique issues, and to evaluate appropriate requirements for those plants.

- M. To conserve the State's scarce water resources, the State Water Board encourages the use of recycled water for cooling water in lieu of marine, estuarine or fresh water.
- N. In order to ensure a high level of statewide consistency in implementing Section 316(b), the State Water Board will assume responsibility for all NPDES permit actions for *existing power plants\** subject to this Policy, including without limitation actions to issue, modify, reissue, revoke, and terminate NPDES permits after [the effective date of the Policy].
- O. Nothing in this Policy precludes the authority of the State Water Board to regulate discharges from *existing power plants\** through NPDES permits, consistent with water quality standards.

## 2. Requirements for *Existing Power Plants\**

- A. Compliance Alternatives. An owner or operator of an *existing power plant\** must comply with either Track 1 or Track 2, below.
  - (1) Track 1. An owner or operator of an *existing power plant\** must reduce *intake flow rate\** at each unit, at a minimum, to a level commensurate with that which can be attained by a *closed-cycle wet cooling system\**. A minimum 93 percent reduction in *intake flow rate\** for each unit is required for Track 1 compliance, compared to the unit's design *intake flow rate\**. The through-screen intake velocity must not exceed 0.5 foot per second. The installation of closed cycle dry cooling systems meets the intent and minimum reduction requirements of this compliance alternative.
  - (2) Track 2. If an owner or operator of an *existing power plant\** demonstrates to the State Water Board's satisfaction that compliance with Track 1 is *not feasible\**, the owner or operator of an *existing power plant\** must reduce impingement mortality and entrainment of marine life for the facility, on a unit-by-unit basis, to a comparable level to that which would be achieved under Track 1, using operational or structural controls, or both.
    - (a) Compliance for impingement mortality shall be determined either:
      - (i) For plants relying solely on reductions in velocity, by monthly verification of through-screen intake velocity not to exceed 0.5 foot per second, or



- (ii) By monitoring required in Section 4.A, below. For measured reductions determined by monitoring, the owner or operator must reduce impingement mortality to a comparable level to that which would be achieved under Track 1. A "comparable level" is a level that achieves at least 90 percent of the reduction in impingement mortality required under Track 1.
- (b) Compliance for entrainment shall be determined either:
- (i) For plants relying solely on reductions in flow, by recording and reporting reductions in terms of monthly flow, in which case a minimum of 93% reduction in flow, as compared to the average actual flow for the corresponding months from 2000 – 2005, must be met, or
  - (ii) For plants relying in whole or in part on other control technologies (e.g., including but not limited to screens or re-location of intake structures), by measured reductions in entrainment determined by monitoring required in Section 4.B, below. The owner or operator must reduce entrainment to a comparable level to that which would be achieved under Track 1. A "comparable level" is a level that achieves at least 90 percent of the reduction in entrainment required under Track 1. If screens are employed to reduce entrainment, compliance shall be determined based on *ichthyoplankton*\*, and on the crustacean phyllosoma and megalops larvae, and squid paralarvae fractions of *meroplankton*\*.
- (c) Technology-based improvements that are specifically designed to reduce impingement mortality and/or entrainment and were implemented prior to [the effective date of the Policy] may be counted towards meeting Track 2 requirements.
- (d) The owner or operator of an *existing power plant*\* with *combined-cycle power-generating units*\* installed prior to [the effective date of the Policy] may achieve compliance in accordance with this paragraph.

The owner or operator may count prior reductions in impingement mortality and entrainment resulting from the replacement of steam turbine power-generating units with *combined-cycle power-generating units*\*, towards meeting Track 2 requirements. Reductions shall be based on reductions in intake flows, calculated as the difference between:

1. the maximum permitted discharge (expressed as million gallons per day (MGD)) for the entire power plant as identified in the plant's prior NPDES permit that authorized the steam turbine power-generating units which were subsequently replaced with the *combined-cycle power-generating units*\* and

2. the maximum permitted discharge (expressed as MGD) for the entire power plant, including the combined cycle units, as identified in the plant's NPDES permit authorizing the *combined-cycle power-generating units\**.

#### B. Final Compliance Dates

- (1) *Existing power plants\** shall comply with Section 2.A, above, as soon as possible, but no later than, the dates shown in Table 1, contained in Section 3.E, below.
- (2) Based on the need for continued operation of an *existing power plant\** to maintain the reliability of the electric system, a final compliance date may be suspended under the following circumstances:
  - (a) **Suspension of Final Compliance Date for Less Than 90 Days for *Existing Power Plants\** Within CAISO Jurisdiction.** If CAISO determines that continued operation of an *existing power plant\** is necessary to maintain the reliability of the electric system in the short-term, CAISO shall provide written notification to the State Water Board, the Regional Water Board with jurisdiction over the *existing power plant\**, and the SACCWIS. If the Executive Directors of the CEC and CPUC do not object in writing within 10 days to CAISO's written notification, the notification provided pursuant to this paragraph will suspend the final compliance date for the shorter of 90 days or the time CAISO determines necessary to maintain reliability. In the event either CEC or CPUC objects as provided in this paragraph, then the State Water Board shall hold a hearing as expeditiously as possible to determine whether to suspend the compliance date in accordance with paragraph (d).
  - (b) **Suspension of Final Compliance Date for Longer Than 90 Days, or consecutive less than 90 day suspensions, for *Existing Power Plants\** Within CAISO Jurisdiction.** If CAISO determines that continued operation of an *existing power plant\** is necessary to maintain the reliability of the electric system, CAISO shall provide written notification to the State Water Board, the Regional Water Board with jurisdiction over the *existing power plant\**, and the SACCWIS. If the Executive Directors of the CEC and CPUC do not object in writing within 10 days to CAISO's determination, the notification provided pursuant to this paragraph will suspend the final compliance date for 90 days. During the 90-day time suspension or within 90 days of receiving a written notification from CAISO, the State Water Board shall conduct a hearing in accordance with paragraph (d) to determine whether to suspend the final compliance date for more than the original 90 days pending, if necessary, full evaluation of amendments to final compliance dates contained in the policy.

- (c) **Suspension of Final Compliance Date for *Existing Power Plants\** Within Los Angeles Department of Water and Power (LADWP) Service Area.** If the LADWP Commission determines, through a public process, that continued operation of an *existing power plant\** operated by LADWP is necessary to maintain the reliability of the electric system in the short-term, LADWP shall provide written notification to the State Water Board, the Regional Water Board with jurisdiction over the *existing power plant\**, and the SACCWIS. Within 45 days of receiving a written notice from LADWP, the State Water Board shall conduct a hearing in accordance with paragraph (d) to determine whether to suspend the final compliance date. In considering whether to suspend or amend the final compliance dates the State Board shall consult with the CAISO.
- (d) **State Water Board Hearings on Suspension of Final Compliance Dates.** In considering whether to suspend or amend the final compliance dates, the State Water Board shall afford significant weight to the recommendations of the CAISO.

#### C. Immediate and Interim Requirements

- (1) No later than [one year after the effective date of this Policy], the owner or operator of an *existing power plant\** with an *offshore intake\** shall install large organism exclusion devices having a distance between exclusion bars of no greater than nine inches, or install other exclusion devices, deemed equivalent by the State Water Board.
- (2) No later than [one year after the effective date of this Policy], the owner or operator of an *existing power plant\** unit that is not directly engaging in *power-generating activities\**, or *critical system maintenance\**, shall cease intake flows, unless the owner or operator demonstrates to the State Water Board that a reduced minimum flow is necessary for operations.
- (3) The owner or operator of an *existing power plant\** must implement measures to mitigate the interim impingement and entrainment impacts resulting from the cooling water intake structure(s), commencing [five years after the effective date of this Policy] and continuing up to and until the owner or operator achieves final compliance. The owner or operator must include in the implementation plan, described in Section 3.A below, the specific measures that will be undertaken to comply with this requirement. An owner or operator may comply with this requirement by:
  - (a) Demonstrating to the State Water Board's satisfaction that the owner or operator is compensating for the interim impingement and entrainment impacts through existing mitigation efforts, including any projects that are

required by state or federal permits as of [the effective date of this Policy];  
or

- (b) Demonstrating to the State Water Board's satisfaction that the interim impacts are compensated for by the owner or operator providing funding to the California Coastal Conservancy which will work with the California Ocean Protection Council to fund an appropriate *mitigation project\**; or
- (c) Developing and implementing a *mitigation project\** for the facility, approved by the State Water Board, which will compensate for the interim impingement and entrainment impacts. Such a project must be overseen by an advisory panel of experts convened by the State Water Board.
- (d) The *habitat production foregone\** method, or a comparable alternate method approved by the State Water Board, shall be used to determine the habitat and area, based on replacement of the annual entrainment, for funding a *mitigation project\**.
- (e) It is the preference of the State Water Board that funding be provided to the California Coastal Conservancy, working with the California Ocean Protection Council, for mitigation projects directed toward increases in marine life associated with the State's Marine Protected Areas in the geographic region of the facility.

#### D. *Nuclear-Fueled Power Plants\**

If the owner or operator of an existing *nuclear-fueled power plant\** demonstrates that compliance with the requirements for *existing power plants\** in Section 2.A, above, of this Policy would result in a conflict with any safety requirement established by the Commission, with appropriate documentation or other substantiation from the Commission, the State Water Board will make a site-specific determination of best technology available for minimizing adverse environmental impact that would not result in a conflict with the Commission's safety requirements. The State Water Board may also establish alternative, site-specific requirements in accordance with Section 3.D(8).

### 3. Implementation Provisions

- A. With the exception of *nuclear-fueled power plants\**, which are covered under 3.D, below, no later than [six months after the effective date of this Policy], the owner or operator of an *existing power plant\** shall submit an implementation plan to the State Water Board.
  - (1) The implementation plan shall identify the compliance alternative selected by the owner or operator, describe the general design, construction, or operational measures that will be undertaken to implement the alternative, and propose a realistic schedule for implementing these measures that is as

short as possible. If the owner or operator chooses to repower the facility to reduce or eliminate reliance upon OTC, or to retrofit the facility to implement either Track 1 or Track 2 alternatives, the implementation plan shall identify the time period when generating power is infeasible and describe measures taken to coordinate this activity through the appropriate electrical system balancing authority's maintenance scheduling process.

- (2) If the owner or operator selects *closed-cycle wet cooling\** as a compliance alternative, the owner or operator shall address in the implementation plan whether recycled water of suitable quality is available for use as makeup water.

B. The SACCWIS shall be impaneled no later than [three months after the effective date of this Policy], by the Executive Director of the State Water Board, to advise the State Water Board on the implementation of this Policy to ensure that the implementation schedule takes into account local area and grid reliability, including permitting constraints. SACCWIS shall include representatives from the CEC, CPUC, CAISO, CCC, SLC, ARB, and State Water Board.

- (1) SACCWIS meetings shall be scheduled regularly and as needed. Meetings shall be open to the public and shall be noticed at least 10 days in advance of the meeting. All SACCWIS products shall be made available to the public.
- (2) The SACCWIS shall review the owner or operator's proposed implementation schedule and report to the State Water Board with recommendations no later than [one year after the effective date of this Policy]. The SACCWIS may consult with other appropriate agencies, including but not limited to the Regional Water Boards, air quality districts, and the LADWP, in the process of reviewing implementation schedules and providing recommendations to the State Water Board.
- (3) The CAISO and the LADWP shall each submit to the SACCWIS by December 31, each year a grid reliability study, for their respective jurisdictions, that has been developed pursuant to a public process and approved by their governing bodies. In order to assure that SACCWIS can provide annual reports to the State Water Board by March 31, the SACCWIS shall promptly meet to consider the reliability studies submitted by CAISO and the LADWP.
- (4) The SACCWIS will report to the State Water Board with recommendations on modifications to the implementation schedule every year starting in 2012. If members of SACCWIS do not believe the full committee recommendations reflect their concerns they may issue minority recommendations that the State Water Board shall consider as part of the SACCWIS recommendations.

- (5) The State Water Board shall consider the SACCWIS' recommendations and direct staff to make modifications, if appropriate, for the State Water Board's consideration. In the event that the SACCWIS energy agencies (CAISO, CPUC, and CEC) make a unanimous recommendation for implementation schedule modification based on grid reliability, the State Water Board shall afford significant weight to the recommendation..
- C. The State Water Board shall reissue or, as appropriate, modify NPDES permits issued to owners or operators of *existing power plants\**, after a hearing in the affected region, to ensure that the permits conform to the provisions of this Policy.
- (1) The permits shall incorporate a final compliance schedule that requires compliance no later than the due dates contained in Table 1, contained in Section 3.E, below. If the State Water Board determines that a longer compliance schedule is necessary to maintain reliability of the electric system per SACCWIS recommendations while other OTC power plants are retrofitted, repowered, or retired or transmission upgrades take place, this delay shall be incorporated into the compliance schedule and stated in the permit findings.
  - (2) The State Water Board shall reopen, if necessary, the relevant permits and modify the final compliance schedules, if appropriate, based on modifications to the policy approved by the State Water Board or the suspension of final compliance dates pursuant to this policy.
  - (3) If an owner or operator selects Track 2 as the compliance alternative, the NPDES permit shall include a monitoring program that complies with Section 4 of this Policy.
  - (4) NPDES permits issued by the State Water Board shall include appropriate permit provisions to implement suspensions of final compliance dates authorized in Section 2.B(2) and modifications to final compliance dates specified in this policy, without reopening the permits.
- D. No later than [three months of the effective date of this Policy] the Executive Director of the State Water Board, using the authority under section 13267(f) of the Water Code, shall request that Southern California Edison (SCE) and Pacific Gas & Electric Company (PG&E) conduct special studies for submission to the State Water Board.
- (1) The special studies shall investigate alternatives for the *nuclear-fueled power plants\** to meet the requirements of this Policy, including the costs for these alternatives.

- (2) The special studies shall be conducted by an independent third party with engineering experience with nuclear power plants, selected by the Executive Director of the State Water Board.
- (3) The special studies shall be overseen by a Review Committee, established by the Executive Director of the State Water Board no later than [three months of the effective date of the Policy], which shall include, at a minimum, representatives of SCE, PG&E, SACCWIS, the environmental community, and staffs of the State Water Board, Central Coast Regional Water Board, and the San Diego Regional Water Board.
- (4) No later than [one year after the effective date of this Policy], the Review Committee, described above, shall provide a report for public comment detailing the scope of the special studies, including the degree to which existing, completed studies can be relied upon.
- (5) No later than [three years after the effective date of this Policy] the Review Committee shall provide the final report and the Review Committee's comments for public comment detailing the results of the special studies and shall present the report to the State Water Board.
- (6) Meetings of the Review Committee shall be open to the public and shall be noticed at least 10 days in advance of the meeting. All products of the Review Committee shall be made available to the public.
- (7) The State Water Board shall consider the results of the special studies, and shall evaluate the need to modify this Policy with respect to the *nuclear-fueled power plants\**. In evaluating the need to modify this Policy, the State Water Board shall base its decision to modify this Policy with respect to the *nuclear-fueled power plants\** on the following factors:
  - (a) Costs of compliance in terms of total dollars and dollars per megawatt hour of electrical energy produced over an amortization period of 20 years;
  - (b) Ability to achieve compliance with Track 1 considering factors including, but not limited to, engineering constraints, space constraints, permitting constraints, and public safety considerations;
  - (c) Potential environmental impacts of compliance with Track 1, including, but not limited to, air emissions.
- (8) If the State Water Board finds that for a specific *nuclear-fueled power plant\** to implement Track 1, either (1) the costs are wholly out of proportion to the costs identified in Tetra Tech, Inc., California's Coastal Power Plants: Alternative Cooling System Analysis, February 2008 (see pages ES-10

[summary], C-1 - C-2 and C-23 - C-40 [Diablo Canyon Power Plant] and N-1 - N-2 and N-25 - N-42 [San Onofre Nuclear Generating Station]) and considered by the State Water Board in establishing Track 1, or (2) that compliance is wholly unreasonable based on the factors in paragraphs 7(b) and (c), then the State Water Board shall establish alternate requirements for that *nuclear-fueled power plant\**. The State Water Board shall establish alternative requirements no less stringent than justified by the wholly out of proportion (i) cost and (ii) factor(s) of paragraph (7). The burden is on the person requesting the alternative requirement to demonstrate that alternative requirements should be authorized.

- (9) In the event the State Water Board establishes alternate requirements for *nuclear-fueled power plants\**, the difference in impacts to marine life resulting from any alternative, less stringent requirements shall be fully mitigated. Mitigation required pursuant to this paragraph shall be a *mitigation project\** directed toward the increase in marine life associated with the State's Marine Protected Areas in the geographic region of the facility. Funding for the *mitigation project\** shall be provided to the California Coastal Conservancy, working with the Ocean Protection Council to fund an appropriate *mitigation project\**.

E. Table 1. Implementation Schedule

Milestone		Responsible Entity/Party	Due Date <sup>2</sup>
1	Request SCE and PG&E to conduct special studies to investigate compliance options for <i>nuclear-fueled power plants*</i> [Section 3.D]	State Water Board Executive Director	[three months after the effective date of the Policy]
2	Establish Review Committee [Section 3.D(3)]	State Water Board Executive Director	[three months after the effective date of the Policy]
3	Establish SACCWIS [Section 3.B]	State Water Board Executive Director	[three months after the effective date of the Policy]
4	Submit a proposed implementation plan to the State and Regional Water Boards [Section 3.A]	Owner/operators of existing fossil-fueled power plants	[six months after the effective date of the Policy]

<sup>2</sup> These compliance dates were developed considering information provided by the CEC, CPUC, CAISO, and LADWP.



	Milestone	Responsible Entity/Party	Due Date <sup>2</sup>
5	Provide a report for public comment, detailing the scope of the special studies on compliance options for <i>nuclear-fueled power plants</i> * [Section 3.D(4)]	Review Committee	[one year after the effective date of the Policy]
6	Review the owners or operators' proposed implementation schedules and report to the State Water Board with recommendations [Section 3.B(2)]	SACCWIS	[one year after the effective date of the Policy]
7	Humboldt Bay Power Plant in compliance	Owner/operator	12/31/2010
8	Potrero Power Plant in compliance	Owner/operator	[one year after the effective date of the Policy]
9	Install large organism exclusion devices with a distance between exclusion bars of no greater than nine inches, or equivalent device [Section 2.C(1)]	Owner/operators of <i>existing power plants</i> * with <i>offshore intakes</i> *	[one year after the effective date of the Policy]
10	Cease intake flows for units not directly engaging in <i>power-generating activities</i> * or <i>critical system maintenance</i> *, or demonstrate to the State Water Board that a reduced minimum flow is necessary for operations [Section 2.C(2)]	Owner/operators of <i>existing power plants</i> *	[one year after the effective date of the Policy]
11	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	3/31/2012
12	South Bay Power Plant in compliance	Owner/operator	12/31/2011
13	Report to State Water Board on results of special studies on compliance options for <i>nuclear-fueled power plants</i> * [Section 3.D(5)]	Review Committee	[three years after the effective date of the Policy]
14	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	3/31/2013
15	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	3/31/2014

Milestone		Responsible Entity/Party	Due Date <sup>2</sup>
16	Commence to implement measures to mitigate the interim impingement and entrainment impacts due to the cooling water intake structure(s) [Section 2.C(3)]	Owners/operators of <i>existing power plants</i> *	[five years after the effective date of the Policy]
17	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	3/31/2015
18	El Segundo, Harbor, and Morro Bay power plants in compliance	Owner/operator	12/31/2015
19	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	3/31/16
20	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	3/31/2017
21	Power plants in CPUC 2010 LTPP Cycle in compliance: Encina, Contra Costa, Pittsburg, Moss Landing [Section 1.J]	Owner/Operator	12/31/2017
22	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	3/31/2018
23	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	3/31/2019
24	Haynes generating station in compliance	Owner/operator	12/31/2019
25	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	3/31/2020
26	Power plants in CPUC 2012 LTPP Procurement Cycle in compliance: Huntington Beach, Redondo, Alamitos, Mandalay, Ormond Beach [Section 1.J]. Scattergood generating station in compliance.	Owner/operator	12/31/2020
27	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	3/31/2021
28	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	3/31/2022
29	San Onofre Nuclear Generating Station in compliance with implementation provisions resulting from State Water Board action on special studies from Section 3.D	Owner/operator	12/31/2022

Milestone		Responsible Entity/Party	Due Date <sup>2</sup>
30	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	3/31/2023
31	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	3/31/2024
32	Diablo Canyon Power Plant in compliance with implementation provisions resulting from State Water Board action on special studies from Section 3.D	Owner/operator	12/31/2024

#### 4. Track 2 Monitoring Provisions

A. Impingement Impacts: The following impingement studies are required to comply with Section 2.A.(2)(a)(ii):

- (1) A baseline impingement study shall be performed, unless the discharger demonstrates, to the State Water Board's satisfaction, that prior studies accurately reflect current impacts. Baseline impingement shall be measured on-site and shall include sampling for all species impinged. The impingement study shall be designed to accurately characterize the species currently impinged and their seasonal abundance to the satisfaction of the State Water Board.
  - (a) The study period shall be at least 36 consecutive months.
  - (b) Impingement shall be measured during different seasons when the cooling system is in operation and over 24-hour sampling periods.
  - (c) When applicable, impingement shall be sampled under differing representative operational conditions (e.g., differing levels of power production, heat treatments, etc.).
  - (d) The study shall not result in any additional mortality above typical operating conditions.
- (2) After the Track 2 controls are implemented, to confirm the level of impingement controls, another impingement study, consistent with Section 4.A(1)(a) to (d), above, shall be performed and reported to the State Water Board.
- (3) The need for additional impingement studies shall be evaluated at the end of each permit period. Impingement studies shall be required when changing

operational or environmental conditions indicate that new studies are needed, at the discretion of the State Water Board.

- B. Entrainment Impacts: The following entrainment studies are required to comply with Section 2.A.(2)(b)(ii):
- (1) A baseline entrainment study shall be performed, unless the discharger demonstrates, to the State Water Board's satisfaction, that prior studies accurately reflect current impacts. Prior studies that may have used a mesh size of 333 or 335 microns for sampling are acceptable for compliance with the review and approval of the State Water Board. If the State Water Board determines that a new baseline entrainment study shall be performed to determine larval composition and abundance in the source water, representative of water that is being entrained, then samples must be collected using a mesh size no larger than 335 microns. Additional samples shall also be collected using a 200 micron mesh to provide a broader characterization of other *meroplankton*\* entrained. The source water shall be determined based on oceanographic conditions reasonably expected after Track 2 controls are implemented. Baseline entrainment sampling shall provide an unbiased estimate of larvae entrained at the intake prior to the implementation of Track 2 controls.
    - (a) Entrainment impacts shall be based on sampling for all *ichthyoplankton*\* and invertebrate *meroplankton*\* species. Individuals collected shall be identified to the lowest taxonomical level practicable. When practicable, genetic identification through molecular biological techniques may be used to assist in compliance with this requirement. Samples shall be preserved and archived such that genetic identification is possible at a later date.
    - (b) The study period shall be at least 36 consecutive months, and shall occur during different seasons, including periods of peak use when the cooling system is in operation (such as the summer months when energy is in high demand). Sampling shall be designed to account for variation in oceanographic conditions and larval abundance and behavior such that abundance estimates are reasonably accurate.
  - (2) After the Track 2 controls are implemented, to confirm the level of entrainment controls, another entrainment study (with a study design to the State Water Board's satisfaction, with samples collected using a mesh size no larger than 335 microns, and with additional samples also collected using a 200 micron mesh) shall be performed and reported to the State Water Board.
  - (3) The need for additional entrainment studies shall be evaluated at the end of each permit period. Entrainment studies shall be required when changing operational or environmental conditions indicate that new studies are needed, at the discretion of the State Water Board.

## 5. Definition of Terms

*Closed-cycle wet cooling system* – Refers to a cooling system, which functions by transferring waste heat to the surrounding air through the evaporation of water, thus enabling the reuse of a smaller amount of water several times to achieve the desired cooling effect. The only discharge of wastewater is from periodic blowdown for the purpose of limiting the buildup of concentrations of materials in excess of desirable limits established by best engineering practice.

*Combined-cycle power-generating units* - Refers to units within a power plant which combined generate electricity through a two-stage process involving combustion and steam. Hot exhaust gas from combustion turbines is passed through a heat recovery steam generator to produce steam for a steam turbine. The turbine exhaust steam is condensed in the cooling system and may or may not be returned to the power cycle. Combined cycle power-generating units are generally more fuel-efficient and use less cooling water than steam boiler units with the same generating capacity.

*Critical system maintenance* – are activities that are critical for maintenance of a plant's physical machinery and absolutely cannot be postponed until the unit is operating to generate electricity.

*Existing power plant(s)* – Refers to any power plant that is not a *new power plant*\*.

*Habitat production foregone* – Refers to the product of the average annual *proportional mortality*\* and the estimated area of the water body that is habitat for the species' source population. Habitat production foregone is an estimate of habitat area production that is lost to all entrained species on an annual basis.

*Ichthyoplankton* – Refers to the planktonic early life stages of fish (i.e., the pelagic eggs and larval forms of fishes).

*Intake flow rate* – Refers to the instantaneous rate at which water is withdrawn through the intake structure, expressed as gallons per minute.

*Meroplankton* – For purposes of this Policy, refers to that component of the *zooplankton*\* community composed of squid paralarvae and the pelagic larvae of benthic invertebrates.

*Mitigation project* – Projects to restore marine life lost through impingement mortality and entrainment. Restoration of marine life may include projects to restore and/or enhance coastal marine or estuarine habitat, and may also include protection of marine life in existing marine habitat, for example through the funding of implementation and/or management of Marine Protected Areas.

*New power plant* – Refers to any plant that is a “new facility”, as defined in 40 C.F.R. § 125.83 (revised as of July 1, 2007), and that is subject to Subpart I, Part 125 of the Code of Federal Regulations (revised as of July 1, 2007) (referred to as “Phase I regulations”).

*Not Feasible* – Cannot be accomplished because of space constraints or the inability to obtain necessary permits due to public safety considerations, unacceptable environmental impacts, local ordinances, regulations, etc. Cost is not a factor to be considered when determining feasibility under Track 1.

*Nuclear-fueled power plant(s)* – Refers to Diablo Canyon Power Plant and/or San Onofre Nuclear Generating Station.

*Offshore intake* –refers to any submerged intake structure that is not located at the shoreline, and includes such intakes that are located in ocean, bay and estuary environments.

*Power-generating activities* – Refers to activities directly related the generation of electrical power, including start-up and shut-down procedures, contractual obligations (hot stand-by), hot bypasses, and *critical system maintenance\** regulated by the Nuclear Regulatory Commission. Activities that are not considered directly related to the generation of electricity include (but are not limited to) dilution for in-plant wastes, maintenance of source-and receiving water quality strictly for monitoring purposes, and running pumps strictly to prevent fouling of condensers and other power plant equipment.

*Proportional mortality* – the proportion of larvae killed from entrainment to the larvae in the source population, as determined by an Empirical Transport Model.

*Zooplankton* – For purposes of this Policy, refers to those planktonic invertebrates larger than 200 microns.

**State of California  
Office of Administrative Law**

In re:  
State Water Resources Control Board

NOTICE OF APPROVAL OF REGULATORY  
ACTION

Regulatory Action:

Government Code Section 11353

Title 23, California Code of Regulations

OAL File No. 2010-0813-05 S

Adopt sections: 2922

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This action adopts a policy on the use of coastal and estuarine waters for power plant cooling, requiring the location, design, construction and capacity of cooling water intake structures to utilize the best technology available for reducing adverse environmental impact.

OAL approves this regulatory action pursuant to section 11353 of the Government Code.

Date: 9/27/2010



David D. Potter  
Senior Staff Counsel

For: SUSAN LAPSLEY  
Director

Original: Thomas Howard  
Copy: Joanna Jensen

NOTICE PUBLICATION/REGULATIONS SUBMISSION

**REGULAR** (See instructions on reverse)

For use by Secretary of State only

STD. 400 (REV. 01-09)

OAL FILE NUMBERS	NOTICE FILE NUMBER	REGULATORY ACTION NUMBER	EMERGENCY NUMBER
	Z-	2010-0813-05 S	

ENDORSED FILED IN THE OFFICE OF

2010 SEP 27 PM 2:57

*Debra Bowen*  
DEBRA BOWEN  
SECRETARY OF STATE

For use by Office of Administrative Law (OAL) only	
NOTICE	REGULATIONS

2010 AUG 13 PM 4:25  
OFFICE OF ADMINISTRATIVE LAW

AGENCY WITH RULEMAKING AUTHORITY  
State Water Resources Control Board (SWRCB)

AGENCY FILE NUMBER (if any)

**A. PUBLICATION OF NOTICE (Complete for publication in Notice Register)**

1. SUBJECT OF NOTICE		TITLE(S)	FIRST SECTION AFFECTED	2. REQUESTED PUBLICATION DATE
Once-through Cooling Water Policy		23		
3. NOTICE TYPE		4. AGENCY CONTACT PERSON		TELEPHONE NUMBER
<input type="checkbox"/> Notice re Proposed Regulatory Action <input type="checkbox"/> Other				FAX NUMBER (Optional)
OAL USE ONLY	ACTION ON PROPOSED NOTICE		NOTICE REGISTER NUMBER	PUBLICATION DATE
	<input type="checkbox"/> Approved as Submitted <input type="checkbox"/> Approved as Modified <input type="checkbox"/> Disapproved/Withdrawn			

**B. SUBMISSION OF REGULATIONS (Complete when submitting regulations)**

1a. SUBJECT OF REGULATION(S)	1b. ALL PREVIOUS RELATED OAL REGULATORY ACTION NUMBER(S)
Once-through Cooling Water Policy	

2. SPECIFY CALIFORNIA CODE OF REGULATIONS TITLE(S) AND SECTION(S) (Including title 26, if toxics related)

SECTION(S) AFFECTED (List all section number(s) individually. Attach additional sheet if needed.)	ADOPT
	2921 2922
	AMEND
TITLE(S)	REPEAL
23	

3. TYPE OF FILING

<input type="checkbox"/> Regular Rulemaking (Gov. Code §11346)	<input type="checkbox"/> Certificate of Compliance: The agency officer named below certifies that this agency complied with the provisions of Gov. Code §511346.2-11347.3 either before the emergency regulation was adopted or within the time period required by statute.	<input type="checkbox"/> Emergency Readopt (Gov. Code, §11346.1(h))	<input type="checkbox"/> Changes Without Regulatory Effect (Cal. Code Regs., title 1, §100)
<input type="checkbox"/> Resubmittal of disapproved or withdrawn nonemergency filing (Gov. Code §511349.3, 11349.4)	<input type="checkbox"/> Resubmittal of disapproved or withdrawn emergency filing (Gov. Code, §11346.1)	<input type="checkbox"/> File & Print	<input type="checkbox"/> Print Only
<input type="checkbox"/> Emergency (Gov. Code, §11346.1(b))		<input checked="" type="checkbox"/> Other (Specify) <u>Gov. Code §11353</u>	

4. ALL BEGINNING AND ENDING DATES OF AVAILABILITY OF MODIFIED REGULATIONS AND/OR MATERIAL ADDED TO THE RULEMAKING FILE (Cal. Code Regs. title 1, §44 and Gov. Code §11347.1)

5. EFFECTIVE DATE OF CHANGES (Gov. Code, §§ 11343.4, 11346.1(d); Cal. Code Regs., title 1, §100)

<input type="checkbox"/> Effective 30th day after filing with Secretary of State	<input type="checkbox"/> Effective on filing with Secretary of State	<input type="checkbox"/> §100 Changes Without Regulatory Effect	<input checked="" type="checkbox"/> Effective other (Specify) <u>Upon approval (Gov. Code §11353)</u>
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6. CHECK IF THESE REGULATIONS REQUIRE NOTICE TO, OR REVIEW, CONSULTATION, APPROVAL OR CONCURRENCE BY, ANOTHER AGENCY OR ENTITY

<input type="checkbox"/> Department of Finance (Form STD. 399) (SAM §6660)	<input type="checkbox"/> Fair Political Practices Commission	<input type="checkbox"/> State Fire Marshal
<input type="checkbox"/> Other (Specify)		

7. CONTACT PERSON	TELEPHONE NUMBER	FAX NUMBER (Optional)	E-MAIL ADDRESS (Optional)
Joanna Jensen	(916) 341-5582		jjensen@waterboards.ca.gov

8. I certify that the attached copy of the regulation(s) is a true and correct copy of the regulation(s) identified on this form, that the information specified on this form is true and correct, and that I am the head of the agency taking this action, or a designee of the head of the agency, and am authorized to make this certification.

SIGNATURE OF AGENCY HEAD OR DESIGNEE	DATE
<i>Elizabeth Haven</i>	8/4/10
TYPED NAME AND TITLE OF SIGNATORY	
Elizabeth Haven, Assistant Deputy Director, Division of Water Quality, SWRCB	

For use by Office of Administrative Law (OAL) only

ENDORSED APPROVED

SEP 2 / 2010

Office of Administrative Law



## CONCISE SUMMARY OF REGULATORY PROVISIONS

California Code of Regulations, Title 23, Division 3, Chapter 22:

2922

### Section ~~2924~~. "Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling"

On May 4, 2010, the State Water Resources Control Board (State Water Board) adopted a statewide policy (Policy) on the use of coastal and estuarine waters for power plant cooling under Resolution No. 2010-0020. The Policy establishes uniform, technology-based standards to implement federal Clean Water Act section 316(b), which requires that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact.

The Policy applies to 19 existing power plants, including two nuclear plants. An owner or operator of an existing power plant must reduce the intake flow rate at each unit, at a minimum, to a level commensurate with that which can be attained by a closed-cycle wet cooling system (a minimum 93% reduction compared to the design intake flow rate). Additionally, the through-screen intake velocity must not exceed 0.5 foot per second.

If the owner or operator can demonstrate that this is not feasible, the owner or operator may comply by reducing environmental impacts for the facility comparably through other means, using operational or structural controls, or both. Previous technology-based improvements, specifically designed to reduce impacts or resulting from the replacement of steam turbine power-generating units with combined-cycle power-generating units, may be counted towards meeting the alternate requirements. Monitoring requirements are dependent upon the type of control technology chosen for compliance.

No later than one year after the effective date of this Policy, all facilities must install large organism exclusion devices and cease intake flows if not engaging in power-generating activities or critical system maintenance. The owner or operator must further mitigate any interim impacts from five years after the effective date until final compliance is achieved.

The Policy employs an adaptive management strategy that will be implemented through National Pollutant Discharge Elimination System permits. The State Water Board will convene a Statewide Advisory Committee on Cooling Water Intake Structures (SACCWIS) with representatives from relevant state agencies and the California Independent System Operator to review plans and schedules submitted by dischargers and to ensure that the implementation schedule is realistic and will not jeopardize the reliability of the electric system. SACCWIS will present its recommendations to the State Water Board at least annually, and the State Water Board will amend the Policy as appropriate based on these recommendations. The schedule may also be temporarily suspended, if necessary for grid reliability purposes.

The Policy requires special studies for the nuclear-fueled power plants to address their unique issues and to evaluate appropriate requirements for those plants. The special studies shall be conducted by an independent third party overseen by a Review Committee. Within three years after the Policy's effective date, the Review Committee shall report to the State Water Board on the ability of these plants to achieve compliance, the cost of compliance, and potential environmental impacts of compliance.



## Appendix B – Final Environmental Checklist

### I. Background

Project Title: Water Quality Control Plan on the Use of Coastal and Estuarine Waters for Power Plant Cooling

Lead Agency: State Water Resources Control Board

Address: 1001 I Street  
Sacramento, CA 95814

Contact Person: Joanna Jensen  
(916/341-5582)

Project Description: See Appendix A and the Substitute Environmental Document, above, for details.

### II. Environmental Impacts

The environmental factors checked below could be potentially affected by this project. See the checklist on the following pages for more details.

- |   |   |   |
|---|---|---|
| <input type="checkbox"/> Aesthetics               | <input type="checkbox"/> Agriculture and Forestry Resources | <input type="checkbox"/> Air Quality                        |
| <input type="checkbox"/> Biological Resources     | <input type="checkbox"/> Cultural Resources                 | <input type="checkbox"/> Geology/Soils                      |
| <input type="checkbox"/> Greenhouse Gas Emissions | <input type="checkbox"/> Hazards & Hazardous Materials      | <input type="checkbox"/> Hydrology/Water Quality            |
| <input type="checkbox"/> Land Use/Planning        | <input type="checkbox"/> Mineral Resources                  | <input type="checkbox"/> Noise                              |
| <input type="checkbox"/> Population/Housing       | <input type="checkbox"/> Public Services                    | <input type="checkbox"/> Recreation                         |
| <input type="checkbox"/> Transportation/Traffic   | <input type="checkbox"/> Utilities/Service Systems          | <input type="checkbox"/> Mandatory Findings of Significance |

**ISSUES**

	Potentially Significant impact	Less Than Significant with Mitigation Incorporated	Less Than Significant impact	No Impact
<b>1. AESTHETICS – Would the project:</b>				
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
 <b>2. AGRICULTURE AND FOREST RESOURCES:</b> In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)) or timberland (as defined by Public Resources Code section 4526)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. AIR QUALITY -- Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. BIOLOGICAL RESOURCES -- Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?				
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>5. CULTURAL RESOURCES -- Would the project:</b>				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §Section 15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §Section 15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>6. GEOLOGY AND SOILS -- Would the project:</b>				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Be located on expansive soil, as defined in Table 19-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>7. GREENHOUSE GAS EMISSIONS -- Would the project:</b>				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
b) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>8. HAZARDS AND HAZARDOUS MATERIALS --</b>				
Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>



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9. HYDROLOGY AND WATER QUALITY -- Would the project:				
a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
j) Inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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10. LAND USE AND PLANNING - Would the project:				
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
11. MINERAL RESOURCES -- Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
12. NOISE -- Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) For a project located within an airport land use plan				

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or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>13. POPULATION AND HOUSING -- Would the project:</b>				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>14. PUBLIC SERVICES</b>				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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<b>15. RECREATION</b>				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>16. TRANSPORTATION/TRAFFIC -- Would the project:</b>				
a) Exceed the capacity of the existing circulation system, based on an applicable measure of effectiveness (as designated in a general plan policy, ordinance, etc.), taking into account all relevant components of the circulation system, including but limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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f) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
17. UTILITIES AND SERVICE SYSTEMS -- Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Result in electrical transmission grid impacts?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

18. MANDATORY FINDINGS OF SIGNIFICANCE

a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?

c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

**Explanations of Impact Assessment (may also follow checklist sections)**

Checklist items are discussed in Section 4 of this staff report.

**PRELIMINARY STAFF DETERMINATION**

- The proposed project COULD NOT have a significant effect on the environment, and, therefore, no alternatives or mitigation measures are proposed.
- The proposed project MAY have a significant or potentially significant effect on the environment, and therefore alternatives and mitigation measures have been evaluated.