# Overview

The Contractor will assist Energy Commission staff, as needed, in proceedings involving an Application for Certification, Post Certification Amendment, an Application for Small Power Plant Exemption, or an Application for Transmission Corridor Designation. (Pub. Resources, Code §§ 25331, 25500, 25541.) The Commission may utilize the contractor’s engineering and environmental services for related post-certification monitoring, including compliance with conditions of certification and laws, ordinances, regulations, and standards (LORS); greenhouse gas and global climate change assessments; and natural gas pipeline safety assessments, as well as related administrative services, document production, and technical training.

The Contractor should understand the role of Energy Commission staff as an independent party in the Commission proceeding, the staff’s responsibility to do an independent analysis, including analysis of unique issues that may arise in one or more cases, and the quasi-adjudicatory nature of the proceeding, with staff and contractors, as needed, serving as expert witnesses in evidentiary hearings, sponsoring their analyses as sworn testimony, and being subject to cross examination.

Following is a description by technical area of the nature of work to be performed in an application proceeding.

# Environmental Technical Descriptions

## AIR QUALITY

### Description

The Energy Commission staff is required to complete an independent analysis of the air quality impacts of power plants and related facilities and transmission corridor zones. The Energy Commission staff analyzes the air quality impacts of all criteria air pollutants (pollutants for which ambient air quality standards have been established), assesses greenhouse gas emissions and nitrogen deposition impacts, evaluates best available air pollution control technologies and other mitigation measures, and evaluates compliance with applicable local, state, and federal air quality laws, regulations, rules, standards, and criteria. In addition, the air quality staff provides modeling to identify potential impacts and effectiveness of mitigation measures, and performs wind shed modeling and analysis. The air quality staff also performs modeling to support the biology, traffic, and visual technical areas. This includes plume (visible, ground hugging, and thermal exhaust) modeling and analysis.

### Required Findings

#### Power Plants and Related Facilities

1. The Warren-Alquist Act [Pub. Resources Code § 25523(a)] requires specific provisions relating to the manner in which the proposed facility is to be designed, sited, and operated in order to assure public health and safety. CEQA also requires that all environmental impacts be fully addressed and that all feasible mitigation measures to substantially lessen significant impacts have been incorporated into the project.
2. The Energy Commission must make findings as to whether the proposed site and related facilities conform to all applicable local, regional, state and federal standards, ordinances, regulations, and laws.
3. Local Air Districts have established emission prohibition regulations and New Source Review (NSR) rules. The emission prohibition regulations specify the maximum permissible emissions for pollutants. NSR rules generally require the use of best available control technologies (BACT) and emission offsets.
4. The State of California and the U.S. Environmental Protection Agency (U.S. EPA) have established ambient air quality standards for various air contaminants. Local air district NSR rules generally require that these standards not be exceeded or that a significant contribution to a violation of the standards not be made by the proposed facility.
5. The U.S. EPA has adopted Prevention of Significant Deterioration (PSD) regulations that establish acceptable impacts where the ambient air quality standards are being met.
6. The staff must analyze a project’s greenhouse gas emissions. Air quality specialists will need to be familiar with evolving approaches and mitigation measures such as carbon sequestering, cap and trade, and carbon tax programs.

#### Transmission Corridor Zones

1. Public Resources Code section 25332 identifies the Energy Commission as lead agency for all transmission corridor zones proposed for designation. California Code of Regulations, Title 20, section 2329, states that staff shall be responsible for preparing a draft and final environmental impact report on a proposed transmission corridor zone.
2. Public Resources Code section 25337 requires findings on each of the following:
3. Conformity of the proposed transmission corridor zone with the strategic plan adopted pursuant to section 25324.
4. Suitability of the proposed transmission corridor zone with respect to environmental quality, public health and safety, land use, economics, and transmission-system impacts.
5. Mitigation measures and alternatives as may be needed to protect environmental quality, public health and safety, the state’s electric transmission grid, or any other relevant matter.

### Scope Of Work

The scope of work includes analyzing information submitted by the project applicant, conducting literature searches, conducting engineering analyses of air pollution control technologies, conducting air quality dispersion modeling analyses, preparing written testimony, and providing oral testimony as needed. The air quality staff is required to develop staff recommendations concerning issues, coordinate analyses with the local air district, incorporate the local air district’s conditions of certification in the staffs’ analysis, and attend workshops, meetings, site visits and hearings. The staff works closely with the staff of the local air districts, the U.S. EPA, and the California Air Resources Board throughout the siting process.

## ALTERNATIVES

### Description

The Energy Commission staff is required to complete an independent analysis of potential alternatives to the site and/or technologies of proposed power plants and related facilities for the purpose of avoiding or minimizing significant adverse environmental impacts associated with a proposed power plant and related facilities and transmission corridor zones. The analysis must include a “no project” alternative.

Required Findings

#### Power Plants and Related Facilities

1. The Energy Commission must review a reasonable range of alternatives, determine their feasibility, compare their impacts with the impacts of the proposed project, determine if there is an environmentally superior alternative, and explain why other alternatives were rejected.
2. If the environmentally superior alternative is the “no project” alternative, the Energy Commission must identify the environmentally superior alternative among the other alternatives and discuss any additional significant effects that would be caused by the alternatives to the project.

#### Transmission Corridor Zones

1. Public Resources Code section 25332 identifies the Energy Commission as lead agency for all transmission corridor zones proposed for designation. California Code of Regulations, Title 20, section 2329, states that staff shall be responsible for preparing a draft and final environmental impact report on a proposed transmission corridor zone.
2. Public Resources Code section 25337 requires findings on each of the following:
3. Conformity of the proposed transmission corridor zone with the strategic plan adopted pursuant to section 25324.
4. Suitability of the proposed transmission corridor zone with respect to environmental quality, public health and safety, land use, economics, and transmission-system impacts.
5. Mitigation measures and alternatives as may be needed to protect environmental quality, public health and safety, the state’s electric transmission grid, or any other relevant matter.

Scope Of Work

The Contractor shall describe a range of reasonable alternatives to the project, or to the location of the project, which could feasibly attain the basic objectives of the project, evaluate the comparative merits of the alternatives, identify the environmentally superior alternative(s), and coordinate with federal agencies in development of joint NEPA/CEQA documents when a federal action is involved.

## BIOLOGICAL RESOURCES

### Description

The Energy Commission staff is required to complete an independent analysis of biological resource impacts associated with a proposed power plant and related facilities and transmission corridor zones. Evaluation in the areas of wildlife biology, including avian impacts, fisheries biology, marine biology, and botany, may be necessary, as well as evaluation of wildlife corridors and migration impacts. The analysis requires an understanding of the proposed project and how it will affect the existing environment, evaluation of direct, indirect, and cumulative impacts, evaluation of alternatives, and recommendations for mitigation to reduce impacts to less than significant.

### Required Findings

#### Power Plants and Related Facilities

1. The Warren-Alquist Act [Public Resources Code section 25523(a)] requires specific provisions relating to the manner in which the proposed facility is to be designed, sited and operated in order to protect environmental quality. The California Environmental Quality Act (CEQA) also requires that the feasible measures to substantially lessen significant impacts have been incorporated into the project.
2. Public Resources Code section 25527 prohibits the use of certain areas such as parks, wilderness reserves, and areas for wildlife protection, as sites for facilities licensed by the Energy Commission unless such use is found to be consistent with the primary uses of such areas, there will be no substantial adverse environmental effects, and the public agency with ownership or control of such areas gives approval.
3. Approved projects must comply with both state and federal Endangered Species Acts. As a lead agency for approving power plants and related facilities, the Energy Commission is obligated by state law and policy to seek to conserve, protect, restore, and enhance threatened and endangered species and their habitat.
4. The Energy Commission must make findings as to whether the proposed site and related facility conform to all applicable local, regional, state, and federal standards, ordinances, regulations and laws. (Pub. Resources Code § 25523(d).) Compliance with the California Fish and Game Code with respect to all protected species and resources throughout California is required.

#### Transmission Corridor Zones

1. Public Resources Code section 25332 identifies the Energy Commission as the lead agency for all transmission corridor zones proposed for designation. California Code of Regulations, Title 20, section 2329 states that staff shall be responsible for preparing a draft and final environmental report on a proposed transmission corridor zone.
2. Public Resources Code section 25337 requires findings on each of the following:
3. Conformity of the proposed transmission corridor zone with the strategic plan adopted pursuant to section 25324.
4. Suitability of the proposed transmission corridor zone with respect to environmental quality, public health and safety, land use, economics, and transmission-system impacts.
5. Mitigation measures and alternatives as may be needed to protect environmental quality, public health and safety, the state’s electric transmission grid, or any other relevant matter.

### Scope Of Work

The scope of work includes analyzing information submitted by the project proponent, conducting literature searches, and completing field observations to assess potential impacts and necessary mitigation, preparing written testimony and providing oral testimony as needed.

A Biologist is required to develop staff recommendations concerning issues, coordinate and encourage active fish and wildlife agency involvement in the siting and transmission corridor designation processes, and evaluate wildlife agency documents such as Natural Community Conservation Plans, Habitat Conservation Plans, and Species Recovery plans. The biologist will also need to coordinate with federal agencies in development of joint NEPA/CEQA documents when a federal action is involved, and attend meetings, site visits, workshops, and hearings.

## COMPLIANCE INSPECTOR

### Description

Energy Commission staff performs routine inspections of construction and operational power plants to ensure compliance with conditions and LORS with an emphasis on public health and safety, reliability, and environmental protection.

Required Findings

Staff is required to provide adequate monitoring of all conditions of certification and LORS. Specifically, the California Code of Regulations, Title 20, section 1770 states:

(a) The Commission shall provide adequate monitoring of all conditions and measures set forth in the final decision required to mitigate potential impacts and to assure that the facility is constructed and operated in compliance with all applicable laws including, but not limited to, air quality, water quality, and public health and safety LORS for all projects certified.

In addition to routine inspections, staff also performs investigation of complaints, emergency response or other incidents that may result in non-compliance with conditions of certification or LORS. The Energy Commission has broad authority to conduct investigations at power plants under its jurisdiction and may hold hearings and may conduct investigations in any part of the state necessary to carry out its powers and duties prescribed in Public Resources Code section 25210.

### Scope Of Work

The scope of work includes collecting and analyzing evidence related to inspections and investigations. This information may be provided by the project owner, other agencies, site personnel, witnesses etc. Compliance inspectors are required to prepare inspection and investigation reports, prepare written testimony and provide oral testimony as needed if hearings are conducted, attend meetings, perform site visits, and attend hearings. Staff works closely with division management and the legal office in developing case strategy. In the course of this work, staff may also work closely with other agencies including but not limited to: Bureau of Land Management, U.S. Fish and Wildlife Service, California Department of Fish and Wildlife, California Department of Occupational Safety and Health (Cal/OSHA), California Public Utilities Commission, California Department of Toxic Substances Control, Regional Water Quality Control Boards, local Certified Unified Program Agencies, local planning departments, fire departments, etc.

## CULTURAL RESOURCES

### Description

The Energy Commission staff is required to complete an independent analysis of potential impacts to cultural resources associated with a proposed power plant and related facilities and transmission corridor zones. Evaluation in the areas of archaeology, architectural history, cultural anthropology, cultural resources GIS, geo-archaeology, history, and historic architecture is necessary. The analysis requires an understanding of a proposed project, knowledge of the resources which may be affected, and consists of an independent analysis of the potential impacts of the project as well as recommendation of any appropriate measures to avoid or reduce potential impacts to less than significant levels if feasible.

Required Findings

#### Power Plants and Related Facilities

1. CEQA [Pub. Resources Code § 21002] states that public agencies should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects. Appendix G (section V.) of the CEQA Guidelines lists cultural resource effects that are typically considered.
2. The Warren-Alquist Act [Pub. Resources Code § 25523(a)] requires specific provisions relating to the manner in which the proposed facility is to be designed, sited, and operated in order to protect environmental quality.
3. The Energy Commission must make findings as to whether the proposed site and related facilities conform to all applicable local, regional, state, and federal standards, ordinances, regulations and laws.

#### Transmission Corridor Zones

1. Public Resources Code section 25332 identifies the Energy Commission as lead agency for all transmission corridor zones proposed for designation. California Code of Regulations, Title 20, section 2329 states that staff shall be responsible for preparing a draft and final environmental impact report on a proposed transmission corridor zone.
2. Public Resources Code section 25337 requires findings on each of the following:
3. Conformity of the proposed transmission corridor zone with the strategic plan adopted pursuant to section 25324.
4. Suitability of the proposed transmission corridor zone with respect to environmental quality, public health and safety, land use, economics, and transmission-system impacts.
5. Mitigation measures and alternatives as may be needed to protect environmental quality, public health and safety, the state’s electric transmission grid, or any other relevant matter.

### Scope Of Work

The scope of work includes independent analysis of information submitted by the applicant, literature searches and field observations to assess potential impacts and determine any appropriate mitigation; encouragement of active local, state, and federal agency involvement; coordination with federal agencies in development of joint NEPA/CEQA documents when a federal action is involved; attendance at meetings, site visits, workshops and hearings; and preparation of both written and oral testimony, as needed.

#### HAZARDOUS MATERIALS MANAGEMENT

### Description

The staff is required to conduct an independent analysis of hazardous materials handling and storage methods that will be used at proposed power plants and related facilities and transmission corridor zones. This requires an understanding of potential public safety implications and environmental impacts that may result from various storage and handling practices. A proposal’s analysis requires an understanding of the types of hazardous materials (e.g., aqueous or anhydrous ammonia, hydrogen, etc.) that may be used at the facility and what risks and impacts such materials pose to the public and environment. Staff will assess the site’s security plan.

### Findings Required By Law Or Regulation

#### Power Plants and Related Facilities

1. The Warren-Alquist Act [Pub. Resources Code 25523(a)] requires specific provisions relating to the manner in which the proposed facility is to be designed, sited and operated in order to protect public health and environmental quality. CEQA also requires that all feasible measures to substantially lessen impacts be incorporated into proposed projects.
2. The Energy Commission must make findings as to whether the proposed site and related facilities conform to all applicable local, regional, state and federal standards, ordinances, regulations, and laws. Specific compliance with the Federal Resource Conservation and Recovery Act and the California Health and Safety Code provisions for hazardous materials management is required.

#### Transmission Corridor Zones

1. Public Resources Code section 25332 identifies the Energy Commission as lead agency for all transmission corridor zones proposed for designation. California Code of Regulations, Title 20, section 2329 states that staff shall be responsible for preparing a draft and final environmental impact report on a proposed transmission corridor zone.
2. Public Resources Code section 25337 requires findings on each of the following:
3. Conformity of the proposed transmission corridor zone with the strategic plan adopted pursuant to section 25324.
4. Suitability of the proposed transmission corridor zone with respect to environmental quality, public health and safety, land use, economics, and transmission-system impacts.
5. Mitigation measures and alternatives as may be needed to protect environmental quality, public health and safety, the state’s electric transmission grid, or any other relevant matter.

### Scope Of Work

The scope of work includes analyzing information submitted by project proponents, conducting literature searches, evaluating hazardous materials risk assessments, completing field observations to assess potential impacts, proposing necessary mitigation, preparing written testimony, and presenting oral testimony as needed.

A person knowledgeable in appropriate storage and handling practice for hazardous materials and site security is required to conduct analysis, develop staff recommendations, and attend meetings, site visits, workshops and hearings.

## LAND USE

### Description

The Energy Commission staff is required to complete an independent analysis of potential land use effects due to a proposed power plant and related facilities and transmission corridor zones. Evaluation of land use impacts focuses on two main aspects: plan conformance and compatible use. Plan conformance concerns the consistency of a proposed project with applicable local, state, regional, and federal land use plans, policies, and ordinances. Compatible use concerns potential direct and indirect conflicts of a proposed project with existing or planned land uses, such as residential, commercial (including airports and airstrips), industrial, recreational, and agricultural uses. The analysis requires an understanding of a proposed project, existing and planned land uses which may be affected, and the relevant land use plans, and consists of an independent evaluation of the conformity and potential impacts of a proposed project, as well as recommendation of any appropriate measures to minimize potential nonconformities and reduce potential impacts to less than significant levels if feasible.

Required Findings

#### Power Plants and Related Facilities

1. CEQA [Pub. Resources Code § 21002] states that public agencies should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects. Appendix G (section X.) of the CEQA Guidelines lists examples of questions regarding land use effects that are typically considered.
2. The Warren-Alquist Act [Pub. Resources Code § 25523(a)] requires specific provisions relating to the manner in which the proposed facility is to be designed, listed, and operated in order to protect environmental quality.
3. The Energy Commission must make findings as to whether the proposed site and related facilities conform to all applicable local, regional, state and federal standards, ordinances, regulations and laws.

#### Transmission Corridor Zones

1. Public Resources Code section 25332 identifies the Energy Commission as lead agency for all transmission corridor zones proposed for designation. California Code of Regulations, Title 20, section 2329 states that staff shall be responsible for preparing a draft and final environmental impact report on a proposed transmission corridor zone.
2. Public Resources Code section 25337 requires findings on each of the following:
3. Conformity of the proposed transmission corridor zone with the strategic plan adopted pursuant to Section 25324.
4. Suitability of the proposed transmission corridor zone with respect to environmental quality, public health and safety, land use, economics, and transmission-system impacts.
5. Mitigation measures and alternatives as may be needed to protect environmental quality, public health and safety, the state’s electric transmission grid, or any other relevant matter.

### Scope Of Work

The scope of work includes an independent analysis of information submitted by the applicant; literature searches and field observations to assess potential impacts and determine any appropriate mitigation; encouragement of active local, state, and federal agency involvement; coordination with federal agencies in development of joint NEPA/CEQA documents when a federal action is involved; attendance at meetings, site visits, workshops and hearings; and preparation of both written and oral testimony as needed.

## NOISE AND VIBRATION

### Description

The staff is required to complete an independent analysis of the noise and vibration impacts resulting from construction and operation of power plants and related facilities (e.g., transmission line construction and operation) and transmission corridor zones. The staff analyzes the noise and vibration impacts on the environment and to worker health and safety. The staff analyzes available mitigation measures and evaluates the project’s conformance with applicable noise elements of the city or county general plan(s) and compliance with applicable local, state, and federal laws, regulations, rules, standards, ordinances and criteria. The staff is responsible for coordinating its analysis with the appropriate state and local agencies and ensuring the timely resolution of issues.

### Required Findings

#### Power Plants and Related Facilities

1. The Warren-Alquist Act [Pub. Resources Code § 25523(a)] requires specific provisions relating to the manner in which the proposed facility is to be designed, sited and operated in order to protect environmental quality. CEQA also requires that all environmental impacts be fully addressed and that all feasible mitigation measures to substantially lessen significant impacts have been incorporated into the project.
2. The Energy Commission must make findings as to whether the proposed site and related facility conform to all applicable local, regional, state, and federal standards, ordinances, regulations and laws.

#### Transmission Corridor Zones

1. Public Resources Code section 25332 identifies the Energy Commission as lead agency for all transmission corridor zones proposed for designation. California Code of Regulations, section 2329 states that staff shall be responsible for preparing a draft and final environmental report on a proposed transmission corridor zone.
2. Public Resources Code section 25337 requires findings on each of the following:
3. Conformity of the proposed transmission corridor zone with the strategic plan adopted pursuant to section 25324.
4. Suitability of the proposed transmission corridor zone with respect to environmental quality, public health and safety, land use, economics, and transmission-system impacts.
5. Mitigation measures and alternatives as may be needed to protect environmental quality, public health and safety, the state’s electric transmission grid, or any other relevant matter.

### Scope Of Work

The scope of work includes analyzing information submitted by the project applicant, conducting literature searches and engineering analyses of noise and vibration control technologies, conducting or reviewing ambient noise surveys, estimating projected noise and vibration levels to sensitive receptors using modeling and measurement methods, preparing written testimony and providing oral testimony as needed. The noise staff is required to develop recommendations concerning noise and vibration issues and mitigation measures, coordinate staffs’ analyses with state and local agencies, and attend workshops, meetings, site visits, and hearings. The staff works closely with the staff of the local agencies and the California Department of Occupational Safety and Health throughout the siting process.

## SOCIOECONOMIC RESOURCES

### Description

The Energy Commission staff is required to complete an independent analysis of socioeconomic impacts associated with a proposed power plant and related facilities and transmission corridor zones. Evaluation in the area of socioeconomics includes an analysis of a project’s direct, indirect, and cumulative effects on population and housing supply, public services (including law enforcement, schools, and parks), and estimated beneficial economic effects. The analysis requires an understanding of the proposed project, how it will affect the existing environment, the significance of impacts, and recommendations for mitigation to offset expected impacts. Socioeconomics staff is also required to compile demographic data to identify any minority and low income populations living in a project area for use in staff’s environmental justice analysis. This task includes compiling data on disadvantaged communities as identified by the California Communities Environmental Health Screening (CalEnviroScreen) Tool.

### Required Findings

#### Power Plants and Related Facilities

1. The Warren-Alquist Act [Pub. Resources Code § 25523(a)] requires specific provisions relating to the manner in which the proposed facility is to be designed, sited and operated in order to protect environmental quality. CEQA also requires that all feasible measures to substantially lessen significant impacts have been incorporated into the project. Appendix G (sections XIII. through XV.) of the CEQA Guidelines lists examples of questions regarding socioeconomic effects that are typically considered.
2. The Energy Commission must make findings as to whether the proposed site and related facilities conform to all applicable local, regional, state, and federal standards, ordinances, regulations, and laws.

#### Transmission Corridor Zones

1. Public Resources Code section 25332 identifies the Energy Commission as lead agency for all transmission corridor zones proposed for designation. California Code of Regulations, Title 20, section 2329, states that staff shall be responsible for preparing a draft and final environmental impact report on a proposed transmission corridor zone.
2. Public Resources Code section 25337 requires findings on each of the following:
3. Conformity of the proposed transmission corridor zone with the strategic plan adopted pursuant to Section 25324.
4. Suitability of the proposed transmission corridor zone with respect to environmental quality, public health and safety, land use, economics, and transmission-system impacts.
5. Mitigation measures and alternatives as may be needed to protect environmental quality, public health and safety, the state’s electric transmission grid, or any other relevant matter.

Scope Of Work

The scope of work includes: analyzing information submitted by the project proponent; conducting literature searches and completing field observations; coordinating with other agencies; preparing written testimony; and providing oral testimony as needed. A socioeconomic specialist is required to develop staff recommendations concerning issues, coordinate and encourage local and state agency involvement in the siting and corridor designation process, and attend meetings, site visits, workshops, and hearings.

## SOILS

### Description

The staff is required to complete an independent analysis of soil resource impacts associated with a proposed power plant and related facilities and transmission corridor zones. Evaluation in the areas of construction activities, soil erosion, soil compaction, and soil stabilization, will be necessary. The analysis requires an understanding of the proposed project and how it will affect the existing soil environment, including agriculture, range land, and forest conservation, evaluation of impacts, and recommendations for mitigation to offset expected impacts.

### Required Findings

#### Power Plants and Related Facilities

1. The Warren-Alquist Act [Pub. Resources Code § 25523(a)] requires specific provisions relating to the manner in which the proposed facility is to be designed, sited, and operated in order to protect environmental quality. CEQA also requires that all feasible measures to substantially lessen significant impacts have been incorporated into the project.
2. Approved projects must comply with applicable local grading ordinances. All grading, earthmoving, and measures to stabilize disturbed soils must conform to accepted engineering practices to prevent excessive and unnecessary loss of soil.
3. The Energy Commission must make findings as to whether the proposed site and related facilities conform to all applicable local, regional, state, and federal standards, ordinances, regulations, and laws, including applicable land use policies and laws concerning conservation of prime agricultural, range, and forest lands.

#### Transmission Corridor Zones

1. Public Resources Code section 25332 identifies the Energy Commission as lead agency for all transmission corridor zones proposed for designation. California Code of Regulations, Title 20, section 2329, states that staff shall be responsible for preparing a draft and final environmental impact report on a proposed transmission corridor zone.
2. Public Resources Code section 25337 requires findings on each of the following:
3. Conformity of the proposed transmission corridor zone with the strategic plan adopted pursuant to section 25324.
4. Suitability of the proposed transmission corridor zone with respect to environmental quality, public health and safety, land use, economics, and transmission-system impacts.
5. Mitigation measures and alternatives as may be needed to protect environmental quality, public health and safety, the state’s electric transmission grid, or any other relevant matter.

### Scope Of Work

The scope of work includes analyzing information submitted by the project proponent, conducting literature searches and completing field observations to assess potential impacts and necessary mitigation, preparing written testimony, and providing oral testimony as needed. A soil scientist is required to develop staff recommendations concerning issues; coordinate and encourage active local, state, and federal agency involvement in the siting and transmission corridor designation processes; coordinate with federal agencies in development of joint NEPA/CEQA documents when a federal action is involved; and attend meetings, site visits, workshops, and hearings.

## TRAFFIC AND TRANSPORTATION

### Description

The Energy Commission staff is required to complete an independent analysis of transportation impacts resulting from construction and operation of a proposed power plant and related facilities and transmission corridor zones. The evaluation will address such areas as existing and anticipated road capacity, design and safety standards, vehicle miles travelled, changes to road and highway levels of service, hazardous materials delivery routes, and proximity of construction worker/truck travel routes to schools and school bus routes. Evaluation of impacts on other forms of transportation, such as railroads and air traffic, including analysis of the effects of solar glint/glare, ground-hugging water vapor plumes, and thermal exhaust plumes, may also be necessary. The analysis requires an understanding of the proposed project, how it will affect the existing environment, the significance of the impacts, and recommendations for mitigation to offset expected impacts.

A Glint and Glare Specialist will provide calculations of estimated glint and glare from solar thermal projects to inform the Traffic and Transportation specialist’s analysis of the effects of a solar project on ground traffic and aviation safety. The Glint and Glare Specialist will identify and evaluate design or operational changes to minimize any significant glare impacts on transportation.

### Required Findings

#### Power Plants and Related Facilities

1. The Warren-Alquist Act [Pub. Resources Code § 25523(a)] requires specific provisions relating to the manner in which the proposed facility is to be designed, sited, and operated in order to protect environmental quality. CEQA also requires that all feasible measures to substantially lessen significant impacts have been incorporated into the project. Appendix G (section XVI.) of the CEQA Guidelines lists examples of questions regarding traffic and transportation effects that are typically considered.
2. Approved projects must comply with applicable state, federal, and local laws and regulations. As a lead agency for approving power plants and related facilities, the Energy Commission is obligated by state law and policy to minimize transportation impacts.

#### Transmission Corridor Zones

1. Public Resources Code section 25332 identifies the Energy Commission as lead agency for all transmission corridor zones proposed for designation. California Code of Regulations, Title 20, section 2329, states that staff shall be responsible for preparing a draft and final environmental impact report on a proposed transmission corridor zone.
2. Public Resources Code section 25337 requires findings on each of the following:
3. Conformity of the proposed transmission corridor zone with the strategic plan adopted pursuant to section 25324.
4. Suitability of the proposed transmission corridor zone with respect to environmental quality, public health and safety, land use, economics, and transmission-system impacts.
5. Mitigation measures and alternatives as may be needed to protect environmental quality, public health and safety, the state’s electric transmission grid, or any other relevant matter.

### Scope Of Work

The scope of work includes analyzing information submitted by the project proponent, conducting field observations, coordinating with other agencies, preparing written testimony, and providing oral testimony as needed. A traffic and transportation specialist is required to develop staff recommendations concerning issues, coordinate and encourage active agency involvement in the siting and corridor designation process, and attend meetings, site visits, workshops, and hearings.

## TRANSMISSION LINE SAFETY AND NUISANCE

### Description

The staff is required to complete an independent analysis of potential transmission line safety and nuisance effects due to a proposed power plant and related facilities and transmission corridor zones. This discipline analyzes the safety and nuisance aspects of proposed transmission lines and conformance with applicable laws, ordinances, regulations, and standards (LORS).

### Required Findings

#### Power Plants and Related Facilities

1. The Energy Commission must make findings as to whether the proposed transmission line system(s) complies with all applicable federal and state LORS, including CEQA requirements.
2. The Energy Commission must make findings as to whether the proposed transmission line systems will comply with safety goals of the project.

#### Transmission Corridor Zones

1. Public Resources Code section 25332 identifies the Energy Commission as lead agency for all transmission corridor zones proposed for designation. California Code of Regulations, Title 20, section 2329, states that staff shall be responsible for preparing a draft and final environmental impact report on a proposed transmission corridor zone.
2. Public Resources Code section 25337 requires findings on each of the following:
3. Conformity of the proposed transmission corridor zone with the strategic plan adopted pursuant to section 25324.
4. Suitability of the proposed transmission corridor zone with respect to environmental quality, public health and safety, land use, economics, and transmission-system impacts.
5. Mitigation measures and alternatives as may be needed to protect environmental quality, public health and safety, the state’s electric transmission grid, or any other relevant matter.

### Scope Of Work

The Contractor shall review the methodology used by the applicant and perform independent analyses of the following: electric and magnetic fields; hazardous shocks; nuisance shocks; radio and audible noise; fire hazards; aviation hazards, including imaginary surface factors; and mitigation measures for the above. The Contractor shall review LORS for completeness and applicability as compiled by the applicant. The Contractor shall identify additional LORS as applicable. The Contractor shall also develop a post-certification compliance monitoring program consisting of a set of monitoring requirements for compliance with applicable LORS and the Energy Commission Decision to be monitored. A verification procedure shall also be developed. The requirements and verifications may be developed using existing staff documents in conjunction with case specifics.

## VISUAL RESOURCES

### Description

The Energy Commission staff is required to complete an independent analysis of visual resource impacts associated with a proposed power plant and related facilities and transmission corridor zones. This analysis includes consideration of the extent to which a project could impact scenic vistas, damage scenic resources, degrade existing visual quality, and create light and glare effects on day and nighttime views in the project area. For a solar project, the Glint and Glare Specialist will provide calculations of estimated glint and glare to inform the Visual Resources specialist’s analysis of the effects of solar projects on visual quality. The Glint and Glare Specialist will identify and evaluate design or operational changes to minimize any significant glare impacts on visual quality.

The visual resources analysis requires an understanding of the proposed project and how it will affect the existing environment, the significance of impacts, and recommendations for mitigation to offset expected impacts. Familiarity with landscaping techniques and the ability to do 3D visual simulations is required.

### Required Findings

#### Power Plants and Related Facilities

1. The Warren-Alquist Act [Pub. Resources Code § 25523(a)] requires specific provisions relating to the manner in which the proposed facility is to be designed, sited, and operated in order to protect environmental quality. CEQA also requires that all feasible measures to substantially lessen significant impacts have been incorporated into the project.
2. The Energy Commission must make findings as to whether the proposed site and related facilities conform to all applicable local, regional, state, and federal standards, ordinances, regulations, and laws. Approved projects should comply with applicable local, state, and federal visual resources standards, plans and policies.

#### Transmission Corridor Zones

1. Public Resources Code section 25332 identifies the Energy Commission as lead agency for all transmission corridor zones proposed for designation. California Code of Regulations, Title 20, section 2329, states that staff shall be responsible for preparing a draft and final environmental impact report on a proposed transmission corridor zone.
2. Public Resources Code section 25337 requires findings on each of the following:
3. Conformity of the proposed transmission corridor zone with the strategic plan adopted pursuant to section 25324.
4. Suitability of the proposed transmission corridor zone with respect to environmental quality, public health and safety, land use, economics, and transmission-system impacts.
5. Mitigation measures and alternatives as may be needed to protect environmental quality, public health and safety, the state’s electric transmission grid, or any other relevant matter.

### Scope Of Work

The scope of work includes: analyzing information submitted by the project proponent; conducting literature searches and completing field observations; preparing written testimony; and providing oral testimony as needed. A visual resources specialist is required to develop staff recommendations concerning issues; coordinate and encourage active local, state, and federal agency involvement in the siting and corridor designation process; coordinate with federal agencies in development of joint NEPA/CEQA documents when a federal action is involved; and attend meetings, site visits, workshops and hearings.

## WASTE MANAGEMENT

### Description

The staff is required to conduct an independent analysis of solid waste handling and disposal methods that will be used at proposed power plants and related facilities and transmission corridor zones. This requires an understanding of potential environmental impacts that may result from various waste disposal practices. A proposal’s analysis requires an understanding of the types of wastes that may be generated at the facility, what impacts such wastes may have if they contaminate land, air, or water. Staff also evaluates whether there is contamination present on a site before project development and what remediation may be required to mitigate site conditions. Staff must be familiar with the key components of Phase I Site Assessments, which describe various soil contaminants, if any.

### Required Findings

#### Power Plants and related Facilities

1. The Warren-Alquist Act [Pub. Resources Code § 25523(a)] requires specific provisions relating to the manner in which the proposed facility is to be designed, sited, and operated in order to protect environmental quality. CEQA also requires that all feasible measures to substantially lessen significant impacts be incorporated into proposed projects.
2. The Energy Commission must make findings as to whether the proposed site and related facilities conform to all applicable local, regional, state, and federal standards, ordinances, regulations, and laws. Specific compliance with the Federal Resource Conservation and Recovery Act and the California Health and Safety Code provisions for hazardous waste management is required.

#### Transmission Corridor Zones

1. Public Resources Code section 25332 identifies the Energy Commission as lead agency for all transmission corridor zones proposed for designation. California Code of Regulations, Title 20, section 2329, states that staff shall be responsible for preparing a draft and final environmental impact report on a proposed transmission corridor zone.
2. Public Resources Code section 25337 requires findings on each of the following:
3. Conformity of the proposed transmission corridor zone with the strategic plan adopted pursuant to section 25324.

2. Suitability of the proposed transmission corridor zone with respect to environmental quality, public health and safety, land use, economics, and transmission-system impacts.

3. Mitigation measures and alternatives as may be needed to protect environmental quality, public health and safety, the state’s electric transmission grid, or any other relevant matter.

### Scope Of Work

The scope of work includes analyzing information submitted by project proponents, conducting literature searches, completing field observations to assess potential impacts, proposing necessary mitigation, preparing written testimony, and presenting oral testimony in evaluating power plant siting and transmission corridor designation applications, as needed. A person knowledgeable in appropriate waste-handling practice for all wastes is required to conduct waste handling analysis, develop staff recommendations, and attend meetings, site visits, workshops, and hearings. The staff works closely with the California Department of Toxic Substances Control, Regional Water Quality Control Boards, and local agencies throughout the siting process.

## WATER RESOURCES

### Description

The staff is required to complete an independent analysis on water resource impacts and evaluation of the flood hazard potential associated with a proposed power plant and related facilities and transmission corridor zones. Evaluation in the areas of water quality, water supply, hydrology, storm water management, wastewater discharge, competing uses for recycled water, water rights, spill containment, and flood hazard may be necessary. The analysis requires an understanding of the proposed project and how it will affect surface and ground waters, water supplies in the project region, various existing users, evaluation of direct, indirect, and cumulative impacts and recommendations for mitigation to offset expected impacts. Understanding of groundwater modeling, groundwater and surface water supply modeling, and wastewater modeling, for purposes of evaluating impacts, may be required for some projects. Understanding of sea level rise and the effects of climate change may also be required for project analysis.

### Required Findings

#### Power Plants and Related Facilities

1. The Warren-Alquist Act [Pub. Resources Code § 25523(a)] requires specific provisions relating to the manner in which the proposed facility is to be designed, sited, and operated in order to protect environmental quality. CEQA also requires that all feasible measures to substantially lessen significant impacts have been incorporated into the project; and
2. The Energy Commission must make findings as to whether the proposed site and related facilities conform to all applicable local, regional, state, and federal standards, ordinances, regulations, and laws. (Pub. Resources Code § 25523(d).)
3. Approved projects should comply with applicable local, state, and federal water quality control standards, plans, and policies. Specific compliance with the state Porter-Cologne Water Quality Control Act and Federal Clean Water Act is required. Concerns include waste discharge into water, National Pollutant Discharge Elimination System (NPDES) permits, and applicable pre-treatment standards for industrial waste water discharges to publicly owned treatment works.

#### Transmission Corridor Zones

1. Public Resources Code section 25332 identifies the Energy Commission as lead agency for all transmission corridor zones proposed for designation. California Code of Regulations, Title 20, section 2329, states that staff shall be responsible for preparing a draft and final environmental report on a proposed transmission corridor zone.
2. Public Resources Code section 25337 requires findings on each of the following:
3. Conformity of the proposed transmission corridor zone with the strategic plan adopted pursuant to section 25324.
4. Suitability of the proposed transmission corridor zone with respect to environmental quality, public health and safety, land use, economics, and transmission-system impacts.
5. Mitigation measures and alternatives as may be needed to protect environmental quality, public health and safety, the state’s electric transmission grid, or any other relevant matter.

### Scope Of Work

The scope of work includes analyzing information submitted by the project proponent, conducting literature searches, and completing field observations to assess potential impacts, conducting independent analysis based on sound engineering and scientific principles and accepted professional standards, identifying necessary mitigation, preparing written testimony, and providing oral testimony as needed. A water resource specialist is required to develop staff recommendations concerning issues, coordinate and encourage active local, state, and federal agency involvement in the siting process, coordinate with federal agencies in development of joint NEPA/CEQA documents when a federal action is involved, and attend meetings, site visits, workshops and hearings. The water resource specialist will also need to evaluate a project’s conformity with the Energy Commission’s Integrated Energy Policy Report’s (currently from 2003) policy that discourages use of fresh water for power plant cooling purposes. The specialist will need to evaluate power plant applicants’ possible contentions that alternative options, such as dry cooling and wet cooling using recycled water, are economically infeasible. The specialist shall use GIS capabilities and cartography functions as appropriate.

# Engineering Technical Descriptions

## CIVIL AND STRUCTURAL ENGINEERING

### Description

The staff is required to complete an independent analysis of civil and structural engineering aspects of proposed power plants and related facilities and transmission corridor zones. The discipline of civil engineering is concerned with:

1. the civil site work associated with site preparation complying with all applicable LORS;
2. civil works proposed as environmental mitigation being properly sized and designed to fulfill intended functions;
3. civil work associated with related facilities, such as access roads, pipelines, and transmission lines, complying with applicable LORS; and
4. The evaluation of the engineering properties of site soils as related to the ability to support imposed foundation loads, the design of earth structures, and the mitigation of adverse soil conditions.

### Required Findings

#### Power Plants and Related Facilities

1. The Energy Commission must make findings as to whether the proposed design criteria and construction methods for all facilities and for developing the site comply with all appropriate LORS;
2. The Energy Commission must make findings as to whether the civil works proposed as mitigation will be properly sized and designed to serve the function and comply with all applicable LORS; and
3. The Energy Commission must make findings as to whether the site development will be consistent with the safety and reliability goals of the project.

#### Transmission Corridor Zones

1. Public Resources Code section 25332 identifies the Energy Commission as lead agency for all transmission corridor zones proposed for designation. California Code of Regulations, Title 20, section 2329, states that staff shall be responsible for preparing a draft and final environmental impact report on a proposed transmission corridor zone.
2. Public Resources Code section 25337 requires findings on each of the following:
3. Conformity of the proposed transmission corridor zone with the strategic plan adopted pursuant to section 25324.
4. Suitability of the proposed transmission corridor zone with respect to environmental quality, public health and safety, land use, economics, and transmission-system impacts.
5. Mitigation measures and alternatives as may be needed to protect environmental quality, public health and safety, the state’s electric transmission grid, or any other relevant matter.

### Scope Of Work

Under guidance from the Energy Commission, the civil engineer will prepare an independent assessment based on information contained in the AFC and Transmission Corridor Designation application, additional information obtained during the discovery phase, and the individual’s knowledge and experience. The assessment will be prepared as expert testimony and be in sufficient depth to ensure that:

1. The civil engineering design criteria has been documented in enough detail to give reasonable assurance that the site can be developed and the related facilities can be designed and constructed in accordance with all applicable LORS;
2. The civil works proposed as environmental mitigation are properly designed to fulfill their intended function; and
3. Definitive requirements are established which will specify the post-certification review and approvals that are necessary to verify that the project has been designed and constructed in conformance with applicable LORS specified by the Energy Commission Decision.

## ELECTRICAL ENGINEERING

### Description

The staff is required to complete an independent analysis of potential electrical engineering effects of a proposed power plant and related facilities and transmission corridor zones. This discipline analyzes electrical design requirements, safety[[1]](#footnote-1), conformance with applicable laws, ordinances, regulations, and standards (LORS), test procedures, and design and manufacturing specifications.

### Required Findings

#### Power Plants and Related Facilities

1. The Energy Commission must make findings as to whether the proposed electrical design criteria, construction and operation of the electrical system and related facilities comply with all applicable LORS.
2. The Energy Commission must make findings as to whether the electrical systems and related facilities are properly sized and designed to serve the proposed function and comply with project performance objectives.
3. The Energy Commission must make findings as to whether the electrical system and related facilities will comply with the safety and reliability goals of the project.

#### Transmission Corridor Zones

1. Public Resources Code section 25332 identifies the Energy Commission as lead agency for all transmission corridor zones proposed for designation. California Code of Regulations, Title 20, section 2329, states that staff shall be responsible for preparing a draft and final environmental impact report on a proposed transmission corridor zone.
2. Public Resources Code section 25337 requires findings on each of the following:
3. Conformity of the proposed transmission corridor zone with the strategic plan adopted pursuant to section 25324.
4. Suitability of the proposed transmission corridor zone with respect to environmental quality, public health and safety, land use, economics, and transmission-system impacts.
5. Mitigation measures and alternatives as may be needed to protect environmental quality, public health and safety, the state’s electric transmission grid, or any other relevant matter.

### Scope Of Work

1. The scope of work includes a review of the design criteria and method used in preparing the transmission line interconnection study and independent analyses of the following: one-line diagram of major equipment; utility and generator contribution to upset conditions; and ratings of major electrical components.
2. The Contractor shall review the LORS compiled by the applicant for completeness and applicability, and identify additional LORS, if needed.
3. The Contractor will develop a post-certification compliance monitoring program consisting of a set of requirements for compliance with applicable LORS and Energy Commission Decision to be monitored. A verification procedure shall also be developed. The requirements and verifications may be developed using existing staff documents in conjunction with case specifics.

## GEOLOGY AND PALEONTOLOGY

### Description

The staff is required to complete an independent analysis of geology and paleontology aspects of the proposed power plants and related facilities and transmission corridor zones. The disciplines of engineering geology and paleontology are concerned with:

1. The identification of site geologic conditions such as earthquakes, landslides, and weak or unstable ground;
2. The effective mitigation of geologic hazards; including impacts from Tsunami, seiche, liquefaction, and landslides;
3. The identification of any adverse impacts the project may cause on the geologic environment, including unique geologic features and resources such as sand dune morphology, impacts that could affect biological habitat and impacts associated with enhanced oil recovery and carbon sequestration; and
4. The identification of any surface or sub-surface fossil remains that may be affected by a proposed project.
5. Understanding and evaluating the effects of sea level rise and climate change.

### Required Findings

#### Power Plants and Related Facilities

1. The Energy Commission must find that the proposed site development can comply with all applicable LORS.
2. The Energy Commission must make findings as to whether the safety and reliability objectives of the proposed project and related facilities can be achieved by effective mitigation of geologic hazards.
3. The Energy Commission must make findings as to whether the environment will be protected, in accordance with all applicable LORS, against project-induced damage in compliance with CEQA.

#### Transmission Corridor Zones

1. Public Resources Code section 25332 identifies the Energy Commission as lead agency for all transmission corridor zones proposed for designation. California Code of Regulations, Title 20, section 2329, states that staff shall be responsible for preparing a draft and final environmental impact report on a proposed transmission corridor zone.
2. Public Resources Code section 25337 requires findings on each of the following:
3. Conformity of the proposed transmission corridor zone with the strategic plan adopted pursuant to section 25324.
4. Suitability of the proposed transmission corridor zone with respect to environmental quality, public health and safety, land use, economics, and transmission-system impacts.
5. Mitigation measures and alternatives as may be needed to protect environmental quality, public health and safety, the state’s electric transmission grid, or any other relevant matter.

### Scope Of Work

Under guidance of the Energy Commission, the engineering geologist and/or paleontologist will prepare an independent assessment based on information contained in the application, additional information obtained during the discovery phase, and the individual’s knowledge and experience applying standards of the profession.

This assessment will be prepared and presented as expert testimony and be in sufficient depth to ensure that:

1. The seismic, other natural hazards, and man-made hazards are properly identified and evaluated including the degree to which such hazards could cause secondary hazards such as structural collapse, spilled toxic or hazardous materials;
2. The safety and reliability objectives of the proposed facilities can be achieved by effective mitigation of geologic hazards;
3. The environment will not be unreasonably damaged by project-induced land failures, e.g., landslides, uncontrolled erosion, settlement, and subsidence;
4. Definitive requirements are established which specify post-certification inspections, reviews, and approvals to verify that the project earthwork has been designed and constructed in conformance with applicable LORS and the Energy Commission’s Decision; and
5. State and federal laws, or applicable standards, are followed regarding proper handling and recordation of any fossil remains.

For purposes of supporting biological resources habitat assessments, the engineering geologist and/or paleontologist shall perform geologic assessments pertaining to sand dune morphology or other project geological issues pertaining to in-ground habitat.

## MECHANICAL ENGINEERING

### Description

The staff is required to complete an independent analysis of the mechanical design of proposed power plants and related facilities and transmission corridor zones. The area of mechanical engineering is concerned with the mechanical design criteria employed and conformance with applicable LORS.

### Required Findings

#### Power Plants and Related Facilities

1. The Energy Commission must make findings as to whether the proposed mechanical design criteria will assure that all major (critical) mechanical components/systems will be designed, fabricated, and installed in accordance with all applicable LORS.
2. The Energy Commission must make findings as to whether the proposed mechanical systems and related facilities will be properly designed, fabricated, and installed in accordance with all applicable LORS.
3. The Energy Commission must make findings as to whether the proposed mechanical systems and related facilities will be properly specified to serve the function proposed to comply with project conformance objectives.
4. The Energy Commission must make findings as to whether the mechanical systems and related facilities will comply with the safety and reliability goals of the project, including gas transmission pipeline safety.

#### Transmission Corridor Zones

1. Public Resources Code section 25332 identifies the Energy Commission as lead agency for all transmission corridor zones proposed for designation. California Code of Regulations, Title 20, section 2329, states that staff shall be responsible for preparing a draft and final environmental impact report on a proposed transmission corridor zone.
2. Public Resources Code section 25337 requires findings on each of the following:
3. Conformity of the proposed transmission corridor zone with the strategic plan adopted pursuant to section 25324.
4. Suitability of the proposed transmission corridor zone with respect to environmental quality, public health and safety, land use, economics, and transmission-system impacts.
5. Mitigation measures and alternatives as may be needed to protect environmental quality, public health and safety, the state’s electric transmission grid, or any other relevant matter.

### Scope Of Work

The area of mechanical engineering requires an independent assessment of the adequacy of mechanical design criteria for all mechanical equipment. This analysis includes evaluation of criteria used to reduce the consequences of a seismic event.

The Contractor shall review for completeness and applicability of LORS, codes, and industry standards compiled by the applicant and identify additional LORS, codes, and standards, if any, applicable to the project.

The Contractor shall identify and contact the state and local permitting and enforcement authorities such as county or city building officials (CBO), fire chiefs or fire marshals, Cal/OSHA, and coordinate with them to perform the necessary evaluations, verifications, inspections, and enforcement functions.

The Contractor shall develop a post-certification compliance monitoring program consisting of a set of requirements for compliance with applicable LORS and the Energy Commission Decision to be monitored and means of verification, for example, by inspection or periodic reports of each requirement having been met.

## POWER PLANT EFFICIENCY

### Description

The staff is required to complete an independent analysis of the efficiency of the proposed power plant. This engineering discipline addresses primarily the issue of efficient utilization of fuels, from the perspective of energy resources conservation and implications on associated environmental impacts, reasonableness of plant auxiliary loads, and (where applicable) comparisons of alternative generating technologies and conformance with applicable LORS.

### Required Findings

1. The Energy Commission must make findings as to whether the project will be designed and operated in compliance with all applicable LORS.
2. The Energy Commission must make findings as to whether the system performance and efficiency of the proposed project will cause adverse impacts to the environment.
3. The Energy Commission must make findings as to whether, for cogeneration projects, the proposed project operation and efficiency meet the criteria of Public Resources Code section 25134 and Title 18, Code of Federal Regulations, section 292.205.

### Scope Of Work

For all power plants, the Contractor will review commercial availability of other more efficient power generating and auxiliary equipment and determine if the proposed level of efficiency is reasonable, or if improvements in efficiency can or should be made based on economic (cost/benefit) considerations.

When appropriate, the Contractor will perform cursory comparative evaluation of plant efficiencies by taking into account:

* Desired fuel throughput vs PURPA limits that may apply to waste-to-energy conversion plants.
* Economic, reliability, safety and environmental factors using different fuels such as biomass, mass-burning refuse, refuse-derived fuels, coal, petroleum coke, and related alternative generating technologies such as direct-fired boilers vs fluidized bed, rotary kilns and others that may apply.

The Contractor will also develop a post-certification compliance monitoring program consisting of requirements for compliance with applicable LORS and the Energy Commission Decision, and means of verification, for example, by inspection or periodic reports to be filed by the applicant with the Energy Commission that each requirement has been met.

For a cogeneration system, the Contractor will:

* Perform independent chemical, thermodynamic, heat transfer, energy, and material balance analyses;
* Evaluate the availability of sufficient heat input to the boiler(s) system required to generate the applicant’s stated quantity of useful thermal and electric power output on an annual average basis. Determine the operating and efficiency standards as defined in the applicable laws.

If the proposed cogeneration facility is not a thermally matched system, i.e., some of the produced steam is proposed to be used for additional (excess) production of electricity by use of steam turbines, perform the following:

* From commercially available equipment, select and identify that which has the most closely matched capability to meet the requirements of the thermal load without use of a steam turbine (if a combined-cycle plant).
* Perform a screening level economic analysis of the thermally matched alternative(s) to the proposed system.
* Compare the preferred/selected alternative with the proposed facility from the perspective of need of capacity and energy, energy resources conservation (fuel consumption), plant efficiency economics and relative reliability, and any other advantage or disadvantage.

## POWER PLANT RELIABILITY

### Description

The staff is required to complete an independent analysis of the reliability of proposed power plants and related facilities and transmission corridor zones. The area of power plant reliability is concerned with achieving project performance goals as measured by capacity and availability. The required analysis covers system and equipment design (redundancy) and maintainability, quality control, fuel and water availability, and an independent assessment of the proposed project’s ability to meet its stated operational and performance goals.

### Required Findings

#### Power Plants and Related Facilities

1. The Energy Commission must make findings as to whether the proposed project will comply with all applicable requirements. (Pub. Resources § 25523, subd. (d).)
2. The Energy Commission must make findings as to whether the proposed project will be designed, constructed, and operated in compliance with the project’s stated safety and reliability goals and objectives.
3. The Energy Commission must make findings as to whether the proposed project will perform in conformance with stated mitigation of site risks from natural hazards.

#### Transmission Corridor Zones

1. Public Resources Code section 25332 identifies the Energy Commission as lead agency for all transmission corridor zones proposed for designation. California Code of Regulations, Title 20, section 2329, states that staff shall be responsible for preparing a draft and final environmental impact report on a proposed transmission corridor zone.
2. Public Resources Code section 25337 requires findings on each of the following:
3. Conformity of the proposed transmission corridor zone with the strategic plan adopted pursuant to section 25324.
4. Suitability of the proposed transmission corridor zone with respect to environmental quality, public health and safety, land use, economics, and transmission-system impacts.
5. Mitigation measures and alternatives as may be needed to protect environmental quality, public health and safety, the state’s electric transmission grid, or any other relevant matter.

### Scope Of Work

The area of power plant reliability requires an independent assessment of a proposed plant’s ability to meet its expected level of performance, i.e., capacity and/or availability factors stated as objectives. The analysis includes selected equipment, components, and redundancy schemes, projections of forced outage and restoration times, and planned maintenance downtime. An evaluation is required of the proposed quality control and assurance programs in the area of equipment procurement, installation, operation, and maintenance over the service life.

The probability of a plant outage occurring due to a seismic event (seismic risk) also must be determined. The projected delivered cost and availability of fuel (fuel supply reliability) and water (water supply availability) over the service life of the plant must be evaluated. Meeting the targeted reliability level may require additional investment in plant equipment. These additions would be justified by a cost/benefit analysis.

The Contractor will develop a post-certification compliance monitoring program consisting of a set of requirements for compliance with applicable LORS and with the Energy Commission Decision, with means of verification that each requirement has been met, for example, by inspection or periodic reports.

## TRANSMISSION SYSTEM ENGINEERING

### Description

The Energy Commission staff is required to complete an independent analysis of potential transmission line engineering aspects of proposed power plants and related facilities and transmission corridor zones. This technical area addresses the adequacy of equipment and related transmission facilities which are required to deliver the electrical output of the proposed generating station reliably and economically to the transmission grid.

### Required Findings

#### Power Plants and Related Facilities

1. The Energy Commission must make findings as to whether the proposed transmission line system and related equipment design criteria comply with all applicable LORS.
2. The Energy Commission must make findings as to whether the proposed transmission line system and related equipment will be properly sized and designed to serve the function proposed and comply with all project performance objectives.
3. The Energy Commission must make findings as to whether the proposed transmission line system and related facilities will comply with the safety and reliability goals of the project.

#### Transmission Corridor Zones

1. Public Resources Code section 25332 identifies the Energy Commission as lead agency for all transmission corridor zones proposed for designation. California Code of Regulations, Title 20, section 2329, states that staff shall be responsible for preparing a draft and final environmental impact report on a proposed transmission corridor zone.
2. Public Resources Code section 25337 requires findings on each of the following:
3. Conformity of the proposed transmission corridor zone with the strategic plan adopted pursuant to section 25324.
4. Suitability of the proposed transmission corridor zone with respect to environmental quality, public health and safety, land use, economics, and transmission-system impacts.
5. Mitigation measures and alternatives as may be needed to protect environmental quality, public health and safety, the state’s electric transmission grid, or any other relevant matter.

### Scope Of Work

In addition to the activities common to all engineering disciplines that are required during the certification process and transmission corridor designation processes, the Contractor shall perform the following analyses in order to make the findings identified above:

1. Determination of adequacy of the conductor size (capacity) from the perspective of cost (material, labor and overhead) and the present worth of the power losses over the life of the project;
2. Out-of-the-plant transmission method regarding technical and economic feasibility or need for overhead or undergrounding all or part of the transmission line;
3. Evaluation of alternatives of termination point, routing options, span lengths, number of towers, tower heights, construction in limited right-of-way, and alternatives thereto; and
4. Evaluation of cost and benefits and reliability implications of single- versus double-circuit options.

The Contractor will also develop a post-certification compliance monitoring program consisting of a set of requirements for compliance with applicable laws, standards, and the Energy Commission Decision to be monitored. A verification procedure shall also be developed. The requirements and verifications may be developed using existing staff documents in conjunction with case specifics.

## TRANSMISSION SYSTEM EVALUATION

### Description

The Energy Commission staff is required to complete an independent analysis of the transmission system and the effects on the system from proposed power plants and related facilities and transmission corridor zones. This technical area addresses the issue of the ability of the utility transmission network to interconnect the electrical output of a proposed project in accordance with utility reliability or risk criteria. The issue also includes consideration of measures that can or should be taken to avoid the adverse impacts the proposed project would have on the transmission system if appropriate mitigation measures were not taken.

### Required Findings

#### Power Plants and Related Facilities

1. The Energy Commission must make findings as to whether the proposed project, when connected to the utility transmission system, will comply with all existing LORS.
2. The Energy Commission must make findings as to whether the potential impacts to reliability and performance of the utility transmission system will be mitigated by the proposed project consistent with project objectives.

#### Transmission Corridor Zones

1. Public Resources Code section 25332 identifies the Energy Commission as lead agency for all transmission corridor zones proposed for designation. California Code of Regulations, Title 20, section 2329, states that staff shall be responsible for preparing a draft and final environmental impact report on a proposed transmission corridor zone.
2. Public Resources Code section 25337 requires findings on each of the following:
3. Conformity of the proposed transmission corridor zone with the strategic plan adopted pursuant to section 25324.
4. Suitability of the proposed transmission corridor zone with respect to environmental quality, public health and safety, land use, economics, and transmission-system impacts.
5. Mitigation measures and alternatives as may be needed to protect environmental quality, public health and safety, the state’s electric transmission grid, or any other relevant matter.

### Scope Of Work

In addition to the activities required during the regulatory certification process, the Contractor shall perform the following analysis in order to make the findings identified above:

1. Review and evaluate the information contained in the Power Sales Agreements;
2. Analyze the power flows in the transmission system within the contiguous area of the proposed project and other lines in the system before and after interconnection of the project.
3. Based on “B” above, identify all adverse impacts the project may have on the utility system.
4. Identify and assess the adequacy of all mitigation measures taken, or to be taken;
5. Recommend additional system upgrades or improvement, if justified by cost/benefit analysis, of further reduction in power losses and reliability improvements under normal and single outage conditions;
6. Determine if common mode outage (structural or other failure of one line will cause failure of a parallel line within the same right-of-way) is likely and, if so, could be economically reduced or eliminated by design or relocation; and
7. Develop a post-certification compliance monitoring program consisting of a set of requirements for compliance with applicable laws, standards, and the Energy Commission Decision to be monitored, and means of verification that each requirement has been met, for example, by inspection or periodic reports.

## WORKER SAFETY AND FIRE PROTECTION

### Description

The staff is required to complete an independent analysis of potential impacts of proposed power plants and related facilities and transmission corridor zones on public and worker safety and fire protection. The area of safety is concerned with identification and mitigation of risk to the worker and public that may result from the project. Fire protection involves on site resources for fire prevention and handling provided by the applicant/project owner, and local government fire prevention and response resources. Such risk occurs from use of hazardous chemicals, fire, seismic events, and other natural and man-made hazards.

### Required Findings

#### Power Plants and Related Facilities

1. The Energy Commission must make findings as to whether the proposed project will be designed, installed, constructed, and operated in compliance with all existing LORS.
2. The Energy Commission must make findings as to whether the proposed project, when constructed and operated, will assure the safety of workers and the general public and provide for facility safety.
3. The Energy Commission must make findings as to whether the proposed project, when constructed, will mitigate site-seismic risk in conformance with reliability and safety goals and objectives of the project, LORS, and CEQA.

#### Transmission Corridor Zones

1. Public Resources Code section 25332 identifies the Energy Commission as lead agency for all transmission corridor zones proposed for designation. California Code of Regulations, Title 20, section 2329, states that staff shall be responsible for preparing a draft and final environmental impact report on a proposed transmission corridor zone.
2. Public Resources Code section 25337 requires findings on each of the following:
3. Conformity of the proposed transmission corridor zone with the strategic plan adopted pursuant to section 25324.
4. Suitability of the proposed transmission corridor zone with respect to environmental quality, public health and safety, land use, economics, and transmission-system impacts.
5. Mitigation measures and alternatives as may be needed to protect environmental quality, public health and safety, the state’s electric transmission grid, or any other relevant matter.

### Scope Of Work

The area of power plant safety and fire protection entails an assessment of the physical risk and risk of fire to workers and to the off-site public that may occur during the construction and operation of the power plant or transmission line over its service life. The analysis required in the area of power and safety also includes an independent evaluation of proposed risk mitigation measures and accident prevention programs that are required by law, codes, or industry standards.

The Contractor shall review for completeness and applicability the list of LORS compiled by the applicant and identify additional LORS, if any, applicable to the project with the objective to reduce or mitigate hazards that may arise from the use of potentially toxic chemicals, fire, structural and equipment failure from accident, flood, storm, seismic event, or operator error.

The Contractor shall identify and contact the state and local permitting and enforcement authorities such as county or city building officials, fire chiefs or marshals, Cal/OSHA, and coordinate with them to perform the necessary evaluations, verifications, inspection, and enforcement functions.

The Contractor shall develop a post-certification compliance monitoring program consisting of a set of requirements for compliance with applicable LORS and the Energy Commission Decision to be monitored and a means of verification that each requirement has been met, for example, by inspection or periodic reports.

1. Safety as used here means to guarantee safe operation under normal and upset conditions and personnel safety. [↑](#footnote-ref-1)