

M e m o r a n d u m

To: Chair David Hochschild
Vice Chair Siva Gunda
Commissioner J. Andrew McAllister, Ph.D.
Commissioner Patty Monahan
Commissioner Kourtney Vaccaro

Date: July 5, 2022

From: Drew Bohan, Executive Director
California Energy Commission

**Subject: GEM ENERGY STORAGE CENTER, DATA ADEQUACY
RECOMMENDATION (21-AFC-02)**

On December 1-2, 2021, GEM A-CAES LLC¹ (applicant), filed an Application for Certification (AFC) to construct and operate an advanced compressed air energy storage facility in unincorporated Kern County approximately one mile northeast of Willow Springs and seven miles west of Rosamond. The 71-acre project site is bounded on the north by Sweetser Road and on the west by Tehachapi Willow Springs Road (90th Street West).

The applicant proposes to construct, own, and operate the 500-megawatt (MW) Gem Energy Storage Center (GESC). GESC would deploy proprietary Hydrostor technology of five 100 MW all-electric air compressors and associated power turbine trains, an underground compressed air storage cavern, aboveground support facilities, and a 10.9-mile interconnection to the Southern California Edison Whirlwind Substation.

The executive director's prior recommendation that the Gem application was inadequate was docketed on December 30, 2021, and the CEC accepted this recommendation at the January 26, 2022 Business Meeting. The applicant docketed materials in response to the executive director's prior data adequacy recommendation in filings between April 25, and June 28, 2022.

Staff has completed its second data adequacy review of the AFC and subsequent filings and has determined that the 12 technical disciplines that were identified as deficient are now complete. Attached is a summary table and the revised data adequacy worksheets for these disciplines. At the July 13, 2022 Business Meeting, staff will recommend that the CEC accept the executive director's recommendation finding the AFC complete, and

¹ GEM A-CAES LLC will be owned by Hydrostor, Inc. or its designated wholly owned subsidiaries. Hydrostor is a private company in Toronto, Canada, which develops utility-scale energy storage facilities deploying its proprietary Advanced Compressed Air Energy Storage (A-CAES) product.

the 12-month timeline to reach a decision on the AFC, as required by Public Resources Code section 25540.6, should begin.

For more information, contact [Leonidas Payne](#), project manager, at (916) 838-2124.

Attachments:

- A - Overview of Data Adequacy Determination
- B - Revised Data Adequacy Worksheets

ATTACHMENT A
 Overview of CEC’s Data Adequacy Determination
 Gem Energy Storage Center 21-AFC-02

Technical Area	Adequate?
AIR QUALITY	YES
ALTERNATIVES.....	YES
BIOLOGICAL RESOURCES	YES
CULTURAL RESOURCES	YES
EFFICIENCY	YES
FACILITY DESIGN	YES
GEOLOGICAL HAZARDS.....	YES
HAZARDOUS MATERIALS	YES
LAND USE.....	YES
NOISE AND VIBRATION	YES
PALEONTOLOGICAL RESOURCES	YES
PROJECT OVERVIEW	YES
PUBLIC HEALTH	YES
RELIABILITY	YES
SOCIOECONOMICS.....	YES
SOILS	YES
TRAFFIC AND TRANSPORTATION	YES
TRANS LINE SAFETY & NUISANCE	YES
TRANSMISSION SYSTEM DESIGN	YES
VISUAL RESOURCES	YES
WASTE MANAGEMENT	YES
WATER RESOURCES	YES
WORKER SAFETY & FIRE PROTECTION	YES

ATTACHMENT B

Revised Data Adequacy Worksheets

Gem Energy Storage Center 21-AFC-02

Adequacy Issue: Adequate Inadequate

DATA ADEQUACY WORKSHEET

Revision No. 1 Date May 2022

Technical Area: Air Quality

Project: Gem Energy Storage Center

Technical Staff: Tao Jiang

Project Manager: Leonidas Payne

Docket: 21-AFC-02

Technical Senior: Joseph Hughes

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (1)	...provide a discussion of the existing site conditions, the expected direct, indirect and cumulative impacts due to the construction, operation and maintenance of the project, the measures proposed to mitigate adverse environmental impacts of the project, the effectiveness of the proposed measures, and any monitoring plans proposed to verify the effectiveness of the mitigation.	Section 2.0 Section 5.1 and Air Quality Appendix 5.1 A-G	Yes	
Appendix B (g) (8) (A)	The information necessary for the air pollution control district where the project is located to complete a Determination of Compliance.	A letter of completeness was issued by Eastern Kern Air Pollution Control District on March 21, 2022 (TN 242796).	No-Yes	Please provide a copy of the letter of completeness from the Eastern Kern Air Pollution Control District.
Appendix B (g) (8) (B)	The heating value and chemical characteristics of the proposed fuels, the stack height and diameter, the exhaust velocity and temperature, the heat rate and the expected capacity factor of the proposed facility.	Section 2.2.2.1 Section 5.1, Table 5.1-9 Appendix 5.1A, Table 1 Appendix 5.1D, Table 2	Yes	
Appendix B (g) (8) (C)	A description of the control technologies proposed to limit the emission of criteria pollutants.	Section 5.1.5	Yes	
Appendix B (g) (8) (D)	A description of the cooling system, the estimated cooling tower drift rate, the rate of water flow through the cooling tower, and the maximum concentrations of total dissolved solids.	Section 2.0	Yes	
Appendix B (g) (8) (E)	The emission rates of criteria pollutants and greenhouse gases (CO2, CH4, N2O, and SF6) from the stack, cooling towers, fuels and materials handling processes, delivery and storage systems, and from all on-site secondary emission sources.	Section 5.1.4.4, Table 5.1-5 Appendix 5.1A, Table 1	Yes	

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Appendix B (g) (8) (F)(i)	A description of typical operational modes, and start-up and shutdown modes for the proposed project, including the estimated frequency of occurrence and duration of each mode, and estimated emission rate for each criteria pollutant during each mode.	Section 2.0 Section 5.1.3.2 Section 5.1.4.3	Yes	
Appendix B (g) (8) (F)(ii)	A description of the project's planned initial commissioning phase, which is the phase between the first firing of emissions sources and the commercial operations date, including the types and durations of equipment tests, criteria pollutant emissions, and monitoring techniques to be used during such tests.	Section 5.1.4.3 Section 5.1.7.3	Yes	
Appendix B (g) (8) (G)	The ambient concentrations of all criteria pollutants for the previous three years as measured at the three Air Resources Board certified monitoring stations located closest to the project site, and an analysis of whether this data is representative of conditions at the project site. The applicant may substitute an explanation as to why information from one, two, or all stations is either not available or unnecessary.	Section 5.1.7, Table 5.1.8 Appendix 5.1 G, Table 1	Yes	
Appendix B (g) (8) (H)	One year of meteorological data collected from either the Federal Aviation Administration Class 1 station nearest to the project or from the project site, or meteorological data approved by the California Air Resources Board or the local air pollution control district.	Section 5.1.7 Appendix 5.1 D, Section 2.0 Appendix 5.1 E Appendix 5.1 G	Yes	

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Appendix B (g) (8) (H) (i)	If the data is collected from the project site, the applicant shall demonstrate compliance with the requirements of the U.S. Environmental Protection Agency document entitled "On-Site Meteorological Program Guidance for Regulatory Modeling Applications" (EPA - 450/4-87-013 (August 1995)), which is incorporated by reference in its entirety.	Section 5.1.7 Appendix 5.1 D, Section 2.0 Appendix 5.1 G	Yes	
Appendix B (g) (8) (H) (ii)	The data shall include quarterly wind tables and wind roses, ambient temperatures, relative humidity, stability and mixing heights, upper atmospheric air data, and an analysis of whether this data is representative of conditions at the project site.	Section 5.1.7 Appendix 5.1 D, Section 2.0 Appendix 5.1 E Appendix 5.1 G	Yes	
Appendix B (g) (8) (I)	An evaluation of the project's direct and cumulative air quality impacts, consisting of the following:			
Appendix B (g) (8) (I) (i)	A screening level air quality modeling analysis, or a more detailed modeling analysis if so desired by the applicant, of the direct criteria pollutant impacts of project construction activities on ambient air quality conditions, including fugitive dust (PM ₁₀) emissions from grading, excavation and site disturbance, as well as the combustion emissions [nitrogen oxides (NO _x), sulfur dioxide (SO ₂), carbon monoxide (CO), and particulate matter less than 10 microns in diameter (PM ₁₀) and particulate matter less than 2.5 microns in diameter (PM _{2.5})] from construction-related equipment;	Appendix 5.1 C Appendix 5.1 D, Table 3	Yes	

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Appendix B (g) (8) (I) (ii)	A screening level air quality modeling analysis, or a more detailed modeling analysis if so desired by the applicant, of the direct criteria pollutant (NO _x , SO ₂ , CO, PM ₁₀ , and PM _{2.5}) impacts on ambient air quality conditions of the project during typical (normal) operation, and during shutdown and startup modes of operation. Identify and include in the modeling of each operating mode the estimated maximum emissions rates and the assumed meteorological conditions;	Section 5.1.7.2 Appendix 5.1 D, Table 4	Yes	
Appendix B (g) (8) (I) (iii)	A protocol for a cumulative air quality modeling impacts analysis of the project's typical operating mode in combination with other stationary emissions sources within a six mile radius which have received construction permits but are not yet operational, or are in the permitting process. The cumulative inert pollutant impact analysis should assess whether estimated emissions concentrations will cause or contribute to a violation of any ambient air quality standard; and	Section 5.1.2 Nearest source is 9 miles. No cumulative modeling protocol was provided.	Yes	
Appendix B (g) (8) (I) (iv)	An air dispersion modeling analysis of the impacts of the initial commissioning phase emissions on state and federal ambient air quality standards for NO _x , SO ₂ , CO, PM ₁₀ , and PM _{2.5} .	Section 5.1.7.3	Yes	
Appendix B (g) (8) (J)	If an emission offset strategy is proposed to mitigate the project's impacts under subsection (g)(1), provide the following information:	N/A	N/A	
Appendix B (g) (8) (J) (i)	The quantity of offsets or emission reductions that are needed to satisfy air permitting requirements of local permitting agencies (such as the air district), state and federal oversight air agencies, and the California Energy Commission. Identify by criteria air pollutant, and if appropriate, greenhouse gas; and	N/A	N/A	

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Appendix B (g) (8) (J) (ii)	Potential offset sources, including location, and quantity of emission reductions;	N/A	N/A	
Appendix B (g) (8) (K)	A detailed description of the mitigation, if any, which an applicant may propose, for all projects impacts from criteria pollutants that currently exceed state or federal ambient air quality standards, but are not subject to offset requirements under the district's new source review rule.	N/A	N/A	
Appendix B (i) (1) (A)	Tables which identify laws, regulations, ordinances, standards, adopted local, regional, state, and federal land use plans, leases, and permits applicable to the proposed project, and a discussion of the applicability of, and conformance with each. The table or matrix shall explicitly reference pages in the application wherein conformance, with each law or standard during both construction and operation of the facility is discussed; and	Section 5.1.8	Yes	
Appendix B (i) (1) (B)	Tables which identify each agency with jurisdiction to issue applicable permits, leases, and approvals or to enforce identified laws, regulations, standards, and adopted local, regional, state and federal land use plans, and agencies which would have permit approval or enforcement authority, but for the exclusive authority of the commission to certify sites and related facilities.	Section 5.1.8.2, Table 5.1-12	Yes	
Appendix B (i) (2)	The name, title, phone number, address (required), and email address (if known), of an official who was contacted within each agency, and also provide the name of the official who will serve as a contact person for Commission staff.	Section 5.1.8.2, Table 5.1-12	Yes	

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Appendix B (i) (3)	A schedule indicating when permits outside the authority of the commission will be obtained and the steps the applicant has taken or plans to take to obtain such permits.	Section 5.1.2 Section 5.1.8.3	Yes	

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Appendix B (g) (1)	...provide a discussion of the existing site conditions, the expected direct, indirect and cumulative impacts due to the construction, operation and maintenance of the project, the measures proposed to mitigate adverse environmental impacts of the project, the effectiveness of the proposed measures, and any monitoring plans proposed to verify the effectiveness of the mitigation.	Pages 5.2-2 to 5.2-5, Pages 5.2-9 to 5.2-23, Pages 5.2-26 to 5.2-34 Table 5.2-7 DA 5.2-1 (TN 242779) Table 6 DA 5.2-6 (TN 242791) Tables 8a, 8b, 9a, and 9b TN 242776 pages 6 & 7	No-Yes	Supply original biological survey report(s) as mentioned (i.e., Blackhawk 2021) for special status plants, animals, and plant communities. Also supply a table showing acreage impacts by habitat of the project site (including linears) separate from the study area (Table 5.2-7). Provide a thorough discussion of what the cumulative impacts are, and the measures proposed to mitigate adverse impacts, if any. It is unclear which mitigation measure would mitigate which impact. Please provide a table showing construction, operational, maintenance, and closure impacts with mitigation measures that would mitigate any adverse impacts. Operational impacts to federal and state jurisdictional bodies of water were not discussed. Please provide a discussion of the operational impacts to federal and state jurisdictional features in the study area.

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Appendix B (g) (13) (A)	A regional overview and discussion of terrestrial and aquatic biological resources, with particular attention to sensitive biological resources within ten (10) miles of the project. Include a map at a scale of 1:100,000 (or other suitable scale) showing sensitive biological resource location(s) in relation to the project site and related facilities and any boundaries of a local Habitat Conservation Plan or similar open space land use plan or designation. Sensitive biological resources include the following:	Pages 5.2-2 to 5.2-24. Figure 5.2-1a, Figure 5.2-1b, Figure 5.2-1c, Figure 5.2-2, Figure 5.2-3a, Figure 5.2-3b, Figure 5.2-4, Figure 5.2-5: 1-7 pages, Figure 5.2-6, Figure 5.2-7 Appendix 5.2A DA 5.2-1 DA 5.2-3 TN 242779 Figure 2 pages 1 of 7, 2 of 7, 3 of 7, 4 of 7, 5 of 7, 6 of 7, and 7 of 7 Biological Resources Supplement Observed Suitable Burrows	No Yes	Please provide a map of the results of the desert tortoise and burrowing owl surveys showing all suitable burrow type locations and burrow classifications for each species. Please provide a map for each of the following species (American badger, Mohave ground squirrel and desert kit fox) of the location where the species was seen (where applicable) and any suitable burrow(s)/den(s) with their classifications in the survey area. As the maps will contain sensitive information, please provide them at the appropriate scale for public viewing (1:350,000) and a copy under confidential cover at a scale (1:6,000) more easily viewable for staff. The project occurs within the Desert Renewable Energy Conservation Plan and the West Mojave Plan, but no discussion was provided. Please provide a discussion of the applicability of these plans to the project. If these plans are applicable, revise the figures(s) to show the plan(s) boundary.
Appendix B (g) (13) (A) (i)	species listed under state or federal Endangered Species Acts;	Pages 5.2-20 to 5.2-23 Sections 5.2.1.8.1 and 5.2.1.8.2. Appendix 5.2A	Yes	
Appendix B (g) (13) (A) (ii)	resources defined in sections 1201 (d) & (u) of Title 20 of the California Code of Regulations;	N/A	N/A	
Appendix B (g) (13) (A) (iii)	species identified as state Fully Protected;	Appendix 5.2A	Yes	
Appendix B (g) (13) (A) (iv)	species covered by Migratory Bird Treaty Act;	Pages 5.2-21 to 5.2-23 Section 5.2.1.8.2 Appendix 5.2A	Yes	

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Appendix B (g) (13) (A) (v)	species and habitats identified by local, state, and federal agencies as needing protection, including but not limited to those identified by the California Natural Diversity Database, or where applicable, in Local Coastal Programs or in relevant decisions of the California Coastal Commission; and	Pages 5.2-2 to 5.2-24 Appendix 5.2 and 5.2B	Yes	
Appendix B (g) (13) (A) (vi)	fish and wildlife species that have commercial and/or recreational value.	TN 242776 page 8	No Yes	Please provide a section or subsection of fish and wildlife with recreational value.
Appendix B (g) (13) (B)	Include a list of the species actually observed and those with a potential to occur within 1 mile of the project site and 1,000 feet from the outer edge of linear facility corridors. Maps or aerial photographs shall include the following:	Appendix 5.2B	Yes	
Appendix B (g) (13) (B) (i)	Detailed maps at a scale of 1:6,000 or color aerial photographs taken at a recommended scale of 1 inch equals 500 feet (1:6,000) with a 30 percent overlap that show the proposed project site and related facilities, biological resources including, but not limited to, those found during project-related field surveys and in records from the California Natural Diversity Database, and the associated areas where biological surveys were conducted. Label the biological resources and survey areas as well as the project facilities;	Figure 5.2-1a, Figure 5.2-1b, Figure 5.2-1c, Figure 5.2-2, Figure 5.2-3a, Figure 5.2-3b, Figure 5.2-4, Figure 5.2-5: 1-7 pages, Figure 5.2-6, Figure 5.2-7 DA 5.2-1 DA 5.2-3 TN 242779 Figure 2 pages 1 of 7, 2 of 7, 3 of 7, 4 of 7, 5 of 7, 6 of 7, and 7 of 7 Biological Resources Supplement Observed Suitable Burrows	No-Yes	Please provide a map of the results of the desert tortoise and burrowing owl surveys showing all suitable burrow type locations and burrow classifications for each species. Please provide a map for each of the following species (American badger, Mohave ground squirrel and desert kit fox) of the location where the species was seen (where applicable) and any suitable burrow(s)/den(s) with their classifications in the survey area. As the maps will contain sensitive information, please provide them at the appropriate scale (1:350,000) for public viewing and as confidential information at a scale (1:6,000) for staff.

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Appendix B (g) (13) (B) (ii)	A depiction of the extent of the thermal plume at the surface of the water if cooling water is proposed to be discharged to a water source. Provide the location for the intake and discharge structures on an aerial photograph(s) or detailed maps. Water sources include, but are not limited to, waterways, lakes, impoundments, oceans, bays, rivers, and estuaries; and	N/A	N/A	
Appendix B (g) (13) (B) (iii)	An aerial photo or wetlands delineation maps at a scale of (1:2,400) showing any potential jurisdictional and non-jurisdictional wetlands delineated out to 250 feet from the edge of disturbance if wetlands occur within 250 feet of the project site and/or related facilities that would be included with the US Army Corps of Engineers Section 404 Permit application. For projects proposed to be located within the coastal zone, also provide aerial photographs or maps as described above that identify wetlands as defined by the Coastal Act.	Pages 5.2-2 to 5.2-5 Figure 5.21b (National Wetland Inventory) Figure 5.2-1c Table 5.2-1 TN 242776 DA 5.2-3 (parts 1-5) TN 242780 TN 242781 TN 242782 TN 242783 TN 242784 DA 5.2-6 (TN 242791) section 5.2.1.2.1	No Yes	Please clarify and discuss why some portions of features are considered under the jurisdiction of the RWQCB and other portions under CDFW as shown in Table 5.2-1. Please provide a discussion of how the boundary was determined for mapping jurisdictional features in Figure 5.2-1c. It is not clear what buffer was used, if any, to determine the acreage impacts shown in Table 5.2-1. Also include a discussion and rationale of the non-jurisdictional features shown in Figure 5.2-1c.
Appendix B (g) (13) (C)	A discussion of the biological resources at the proposed project site and related facilities. Related facilities include, but are not limited to, laydown and parking areas, gas and water supply pipelines, transmission lines, and roads. The discussion shall address the distribution of vegetation community types, denning or nesting sites, population concentrations, migration corridors, breeding habitats, and other appropriate biological resources including the following:	Pages 5.2-2 to 5.2-24. Page 5.2-27	Yes	

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Appendix B (g) (13) (C) (i)	A list of all the species actually observed;	Appendix 5.2B	Yes	
Appendix B (g) (13) (C) (ii)	A list of sensitive species and habitats with a potential to occur (as defined in (A) above); and	Table 5.3-1, Page 5.2-5, 5.2-20 Appendix 5.2A	Yes	
Appendix B (g) (13) (C) (iii)	If cooling water is taken directly from or discharged to a surface water feature source, include a description of the intake structure, screens, water volume, intake velocity hydraulic zone field of influence, and the thermal plume dispersion area as depicted in response to B(ii) above. Describe the thermal plume size and dispersion under high and low tides, and in response to local currents and seasonal changes. Provide a discussion of the aquatic habitats, biological resources, and critical life stages found in these affected waters. For repower projects that anticipate no change in cooling water flow, this information shall be provided in the form of the most recent federal Clean Water Act 316(a) and (b) studies of entrainment and impingement impacts that has been completed within the last five (5) years. For new projects or repower projects proposing to use once-through cooling and anticipating an increase in cooling water flow, provide a complete impingement and entrainment analysis per guidance in (D)(ii), below.	N/A	N/A	

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Appendix B (g) (13) (D)	A description and results of all field studies and seasonal surveys used to provide biological baseline information about the project site and associated facilities. Include copies of the California Natural Diversity Database records and field survey forms completed by the applicant's biologist(s). Identify the date(s) the surveys were completed, methods used to complete the surveys, and the name(s) and qualifications of the biologists conducting the surveys. Include:	Page 5.2-3 Page 5.2-9 Tables 5.2-2 to 5.2-23 Appendix 5.2D DA 5.2-5 (TN 242785) TN 242786 TN 242787 TN 242788 TN 242789 TN 242790 TN 242776 page 10	No Yes	Please provide the resumes of all biologists who conducted field surveys. Please provide field survey forms or other data collected during field surveys including the reference Blackhawk 2021. Whole original survey reports are preferred. Provide the results of protocol level surveys for all species with suitable habitat (including breeding or foraging) in the project area. Conduct surveys for Crotch's bumble bee using the latest survey protocols and provide reference for survey protocols/guidelines, methodology of surveys, and results.
Appendix B (g) (13) (D) (i)	Current biological resources surveys conducted using appropriate field survey protocols during the appropriate season(s). State and federal agencies with jurisdiction shall be consulted for field survey protocol guidance prior to surveys if a protocol exists;	Pages 5.2-10 through 5.2-15; DA 5.2-1 (TN 242779) page 1 & 2; DA 5.2-6 (TN 242791) Section 5.2.1.5; TN 242776 page 10 & 11;	No Yes	Please provide reference for protocols used for each species surveyed. Provide a discussion of if/why surveys were not conducted for several species with suitable habitat (breeding or foraging) in the project area. For example, Crotch's bumble bee, desert kit fox, Mohave ground squirrel, and golden eagle). Provide the results of protocol level surveys for all species with suitable habitat (breeding or foraging) in the project area.

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Appendix B (g) (13) (D) (ii)	If cooling water is proposed to be taken directly from or discharged to a surface water feature source, seasonal aquatic resource studies and surveys shall be conducted. Aquatic resource survey data shall include, but is not limited to, fish trawls, ichthyoplankton and benthic sampling, and related temperature and water quality samples. For new projects or repower projects anticipating a change in cooling water flows, sampling protocols shall be provided to the Energy Commission staff for review and concurrence prior to the start of sampling. For repower projects not anticipating a change in cooling water flows, this information shall be provided in the form of the most recent federal Clean Water Act 316(b) impingement and entrainment impact study completed within five (5) years of the AFC filing date; and	N/A	N/A	
Appendix B (g) (13) (D) (iii)	If the project or any related facilities could impact a jurisdictional or non-jurisdictional wetland, provide completed Army Corps of Engineers wetland delineation forms and/or determination of wetland status pursuant to Coastal Act requirements, name(s) and qualifications of biologist(s) completing the delineation, the results of the delineation and a table showing wetland acreage amounts to be impacted.	Pages 5.2-2 through 5.2-5; Page 5.2-11; Page 5.2-28 Table 5.2-2 Figure 5.2-1c	Yes	
Appendix B (g) (13) (E)	Impacts discussion of the following:	Pages 5.2-21 to 5.2-23 Page 5.2-26	Yes; but see below	

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Appendix B (g) (13) (E) (i)	all impacts (direct, indirect, and cumulative) to biological resources from project site preparation, construction activities, plant operation, maintenance, and closure. Discussion shall also address sensitive species habitat impacts from cooling tower drift and air emissions;	Pages 5.2-21 through 5.2-23, Page 5.2-26	Yes	
Appendix B (g) (13) (E) (ii)	facilities that propose to take water directly from, and/or discharge water to surface water features, daytime and nighttime impacts from the intake and discharge of water during operation, water velocity at the intake screen, the intake field of influence, impingement, entrainment, and thermal discharge. Provide a discussion of the extent of the thermal plume, effluent chemicals, oxygen saturation, intake pump operations, and the volume and rate of cooling water flow at the intake and discharge location; and	N/A	N/A	
Appendix B (g) (13) (E) (iii)	Methods to control biofouling and chemical concentrations, and temperatures that are currently being discharged or will be discharged to receiving waters.	N/A	N/A	
Appendix B (g) (13) (F)	A discussion of all feasible mitigation measures including, but not limited to the following:	Pages 5.2-30 through 5.2-34	Yes	
Appendix B (g) (13) (F) (i)	All measures proposed to avoid and/or reduce adverse impacts to biological resources;	Pages 5.2-30 through 5.2-34	Yes	

Technical Area: Biological Resources
 Project Manager: Leonidas Payne

Project: Gem Energy Storage Center
 Docket: 21-AFC-02

Technical Staff: Andrea Stroud
 Technical Senior: Jon Hilliard

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (13) (F) (ii)	All off-site habitat mitigation and habitat improvement or compensation, and an identification of contacts for compensation habitat and management;	Not provided TN 242776, page 11	No Yes	The project will adversely impact suitable habitat for several species. Please provide a description of suitable mitigation options for loss of habitat (e.g., desert tortoise, burrowing owl, Mohave ground squirrel, golden eagle, Swainson's hawk and any other sensitive habitat, plant, and animal. Also provide appropriate agencies and their contact information.
Appendix B (g) (13) (F) (iii)	Design features to better disperse or eliminate a thermal discharge;	N/A	N/A	
Appendix B (g) (13) (F) (iv)	All measures proposed to avoid or minimize adverse impacts of cooling water intake. This shall include a Best Technology Available (BTA) discussion. If BTA is not being proposed, the rationale for not selecting BTA must be provided; and	N/A	N/A	
Appendix B (g) (13) (F) (v)	Educational programs to enhance employee awareness during construction and operation to protect biological resources.	Page 5.2-32	Yes	
Appendix B (g) (13) (G)	A discussion of compliance and monitoring programs to ensure the effectiveness of impact avoidance and mitigation measures incorporated into the project.	TN 242776, page 12; DA 5.2-1 (TN 242779), Section 7.0	No Yes	Please provide a discussion of the necessary compliance and monitoring plans needed to mitigate adverse impacts to sensitive species and habitats (e.g., desert tortoise and state waters)

Adequacy Issue: Adequate Inadequate

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Revision No. 1 Date May 2022

Technical Area: Biological Resources
 Project Manager: Leonidas Payne

Project: Gem Energy Storage Center
 Docket: 21-AFC-02

Technical Staff: Andrea Stroud
 Technical Senior: Jon Hilliard

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (13) (H)	Submit copies of any preliminary correspondence between the project applicant and state and federal resource agencies regarding whether federal or state permits from other agencies such as the U. S. Fish and Wildlife Service, the National Marine Fisheries Service, the U.S. Army Corps of Engineers, the California Department of Fish and Game, and the Regional Water Quality Control Board will be required for the proposed project.	TN 242776, page 13	No Yes	Please submit copies of correspondence with all appropriate agencies.
Appendix B (i) (1) (A)	Tables which identify laws, regulations, ordinances, standards, adopted local, regional, state, and federal land use plans, leases, and permits applicable to the proposed project, and a discussion of the applicability of, and conformance with each. The table or matrix shall explicitly reference pages in the application wherein conformance, with each law or standard during both construction and operation of the facility is discussed; and	DA 5.2-6 (TN 242791), Table 5.2-10 Table 5.2-8	No Yes	Please include in Table 5.2-8 pages in the application applicable to each LORS, and conformance of each measure during construction and operations of the facility.
Appendix B (i) (1) (B)	Tables which identify each agency with jurisdiction to issue applicable permits, leases, and approvals or to enforce identified laws, regulations, standards, and adopted local, regional, state and federal land use plans, and agencies which would have permit approval or enforcement authority, but for the exclusive authority of the commission to certify sites and related facilities.	DA 5.2-6 (TN 242791) Table 5.2-9	No Yes	Please include in Table 5.2-9 the Lahontan Regional Water Quality Control Board and the U.S. Army Corps of Engineers and all applicable information.

Adequacy Issue: Adequate Inadequate

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Revision No. 1 Date May 2022

Technical Area: Biological Resources
 Project Manager: Leonidas Payne

Project: Gem Energy Storage Center
 Docket: 21-AFC-02

Technical Staff: Andrea Stroud
 Technical Senior: Jon Hilliard

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (i) (2)	The name, title, phone number, address (required), and email address (if known), of an official who was contacted within each agency, and also provide the name of the official who will serve as a contact person for Commission staff.	DA 5.2-6 (TN 242791) Table 5.2-9	No Yes	Please include in Table 5.2-9 details of specific agency contact who would serve as the contact person from each agency.
Appendix B (i) (3)	A schedule indicating when permits outside the authority of the commission will be obtained and the steps the applicant has taken or plans to take to obtain such permits.	TN 242776, page 14	No Yes	Please supply a timetable for Section 7 coordination/consultation and any other permitting requirements by other agencies (e.g., CDFW and RWQCB).

Adequacy Issue: Adequate Inadequate

DATA ADEQUACY WORKSHEET

Revision No. 1 Date June 29, 2022

Technical Area: Cultural Resources

Project: Gem Energy Storage Center

Technical Staff: Melissa Mourkas, Cameron Travis

Project Manager: Leonidas Payne

Docket: 21-AFC-02

Technical Senior: Gabriel Roark

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (1)	...provide a discussion of the existing site conditions, the expected direct, indirect and cumulative impacts due to the construction, operation and maintenance of the project, the measures proposed to mitigate adverse environmental impacts of the project, the effectiveness of the proposed measures, and any monitoring plans proposed to verify the effectiveness of the mitigation.	Existing site conditions: Sections 5.3.1 through 5.3.2.1, Pages 5.3-4 through 5.3-23. Direct, indirect, & cumulative impacts: Sections 5.3.3.2 through 5.3.4, Pages 5.3-24 through 5.3-25. Measures Proposed: Sections 5.3.5.1 through 5.3.5.2, Pages 5.3-25 through 5.3-27. Mitigation measures, effectiveness, and mitigation and monitoring plans: Sections 5.3.5.1 through 5.3.5.2, Pages 5.3-25 through 5.3-27.	Yes	
Appendix B (g) (2) (A)	A summary of the ethnology, prehistory, and history of the region with emphasis on the area within no more than a 5-mile radius of the project location.	Sections 5.3.1.1 through 5.3.1.6.5, Pages 5.3-5 through 5.3-11.	Yes	

<p>Appendix B (g) (2) (B)</p>	<p>The results of a literature search to identify cultural resources within an area not less than a 1-mile radius around the project site and not less than one-quarter (0.25) mile on each side of the linear facilities. Identify any cultural resources listed pursuant to ordinance by a city or county, or recognized by any local historical or archaeological society or museum.</p> <p>Literature searches to identify the above cultural resources must be completed by, or under the direction of, individuals who meet the Secretary of the Interior's Professional Standards for the technical area addressed.</p> <p>Copies of California Department of Parks and Recreation (DPR) 523 forms (Title 14 CCR §4853) shall be provided for all cultural resources (ethnographic, architectural, historical, and archaeological) identified in the literature search as being 45 years or older or of exceptional importance as defined in the National Register Bulletin Guidelines, (36CFR60.4(g)). A copy of the USGS 7.5' quadrangle map of the literature search area delineating the areas of all past surveys and noting the California Historical Resources Information System (CHRIS) identifying number shall be provided. Copies also shall be provided of all technical reports whose survey coverage is wholly or partly within .25 mile of the area surveyed for the project under Section (g)(2)(C), or which report on any archaeological excavations or architectural surveys within the literature search area.</p>	<p>Literature search results within at least 1 mile radius of the project site: AFC Section 5.3.2.1, Pages 5.3-15 through 5.3-23; Appendix 5.3B, Section 4, Pages 15–25 and 5.3B, Appendix A.</p> <p>Information provided under confidential cover. TNs 243639-243671, 243425, and 243742.</p> <p>Professional qualifications: AFC Section 5.3, Page 5.3-4, Section 5.3.2.1.2, Page 5.3-23; Appendix 5.3C</p> <p>Quadrangle Map delineating the areas of all past surveys: Appendix A.</p> <p>Copies of all technical reports within .25 mile of the area surveyed, or which report on any archaeological excavations or architectural surveys within the literature search area: Appendix 5.3, Pages 15 through 19; Appendix E.</p> <p>Information provided under confidential cover. TNs 243639-243671, 243425, and 243742.</p>	<p>No Yes</p> <p>Yes</p> <p>No Yes</p>	<p>Applicant's records search only covered 0.5 mile surrounding the project and no buffer at all directly east of the project site; please submit records search results extending to 1.0 mile for the area surrounding the project site. The project site is not identified on maps provided. Revise the maps to include the project site and the 1.0 mile buffer.</p> <p>Please provide USGS 7.5' quadrangle map of the literature search area that includes the following reports currently missing from the literature search maps: KE-00355, KE-00519, KE-00634, KE-00802, KE-00803, KE-00869, KE-01181, KE-01182, KE-01183, KE-01196, KE-01341, KE-01628, KE-01630, KE-01867, KE-01960, KE-02002, KE-02232, KE-02244, KE-02825, KE-02826, KE-02827, KE-02953, KE-02954, KE-03493, KE-03781, KE-03787, KE-03874, KE-03889, KE-04023, KE-04057, KE-04080, KE-04099, KE-04224, KE-04226, KE-04234, KE-04435, KE-04435A, KE-04749, KE-04833, KE-05013, KE-05043, KE-05163.</p> <p>The confidential CR technical report states that 68 previous investigations have been conducted and documented within one-half mile of the Project area since 1961 of which forty-seven of these studies encompass portions of the Project</p>
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Adequacy Issue: Adequate Inadequate

DATA ADEQUACY WORKSHEET

Revision No. 1 Date June 29, 2022

Technical Area: Cultural Resources

Project: Gem Energy Storage Center

Technical Staff: Melissa Mourkas, Cameron Travis

Project Manager: Leonidas Payne

Docket: 21-AFC-02

Technical Senior: Gabriel Roark

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
				area. However, only copies of forty five previous cultural studies were provided, of which two were not listed among the sixty eight listed in the cultural resources technical report. Please provide copies of the remaining cultural studies within 0.25 mile of the area surveyed for the project.

<p>Appendix B (g) (2) (C)</p>	<p>The results of new surveys or surveys less than 5 years old shall be provided if survey records of the area potentially affected by the project are more than five (5) years old. Surveys to identify new cultural resources must be completed by (or under the direction of) individuals who meet the Secretary of the Interior's Professional Standards for the technical area addressed.</p> <p>New pedestrian archaeological surveys shall be conducted inclusive of the project site and project linear facility routes, extending to no less than 200' around the project site, substations and staging areas, and to no less than 50' to either side of the right-of-way of project linear facility routes. New historic architecture field surveys in rural areas shall be conducted inclusive of the project site and the project linear facility routes, extending no less than .5 mile out from the proposed plant site and from the routes of all above-ground linear facilities. New historic architecture field surveys in urban and suburban areas shall be conducted inclusive of the project site, extending no less than one parcel's distance from all proposed plant site boundaries. New historic architecture field reconnaissance ("windshield survey") in urban and suburban areas shall be conducted along the routes of all linear facilities to identify, inventory, and characterize structures and districts that appear to be older than 45 years or that are exceptionally significant, whatever their age.</p> <p>A technical report of the results of the new surveys, conforming to the Archaeological Resource Management Report format (CA Office of Historic Preservation Feb 1990), which is incorporated by reference in its entirety, shall be separately provided and submitted (under confidential cover if archaeological site locations are included).</p>	<p>New pedestrian archaeological surveys: Section 5.3.2.1.2, Page 5.3-23 to 5.3-24; Appendix 5.3B, Pages 1, 31-36; Conf. App. 5.3A, C</p> <p>New Historic Architecture Field Survey: AFC Section 5.3.2.1.3, Pages 5.3-24.</p> <p>Information provided under confidential cover. TNs 243639-243671, 243425, and 243742.</p> <p>The architectural field survey was provided as TN 243019, Historic Resources Evaluation Report, as an Addendum to the original Cultural Resources Technical Report Appendix 5.3B.</p> <p>Appendix 5.3B; Confidential Appendices 5.3A, 5.3C</p>	<p>Yes</p> <p>No Yes</p> <p>No Yes</p> <p>Yes</p>	<p>Confidential Appendix 5.3C does not show survey coverage for the project site; please provide scaled topographic quadrangle maps depicting the survey coverage, including buffer areas, for all project components surveyed. Compare to Confidential Appendix 5.3A, as additional resources might be in the survey area.</p> <p>No new historic architecture field survey was provided. Provide a historic architecture field survey inclusive of the project site and the project linear facility routes, extending no less than 0.5 mile from the proposed plant site and from the routes of all above-ground linear facilities. The 0.5 mile buffer must extend from and include the linears' right of way.</p>
<p>Appendix B (g) (2) (C) cont.</p>	<p>Information included in the technical report shall also be provided in the Application for Certification, except that confidential information (archaeological sites or areas of religious significance) shall be submitted under a request</p>	<p>AFC Section 5.3 Cultural Resources</p>	<p>Yes</p>	

Adequacy Issue: Adequate Inadequate

DATA ADEQUACY WORKSHEET

Revision No. 1 Date June 29, 2022

Technical Area: Cultural Resources

Project: Gem Energy Storage Center

Technical Staff: Melissa Mourkas, Cameron Travis

Project Manager: Leonidas Payne

Docket: 21-AFC-02

Technical Senior: Gabriel Roark

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
	for confidentiality pursuant to Title 20, California Code of Regulations, § 2501 et seq. At a minimum, the technical report shall include the following:			
Appendix B (g) (2) (C) (i)	The summary from Appendix B (g)(2)(A) and the literature search results from Appendix B (g)(2)(B);	Sections 5.3.1.1 through 5.3.1.6.5, Pages 5.3-5 through 5.3-11, and 5.3.2.1.1, Pages 5.3-15 through 5.3-23. Information provided under confidential cover. TNs 243639-243671, 243425, and 243742.	No Yes	Please revise the records search summary and tables to reflect additional previous studies and recorded resources from the updated records search and architectural survey.

Adequacy Issue: Adequate Inadequate

DATA ADEQUACY WORKSHEET

Revision No. 1 Date June 29, 2022

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Project: Gem Energy Storage Center

Technical Staff: Melissa Mourkas, Cameron Travis

Project Manager: Leonidas Payne

Docket: 21-AFC-02

Technical Senior: Gabriel Roark

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (2) (C) (ii)	The survey procedures and methodology used to identify cultural resources and a discussion of the cultural resources identified by the survey;	<p>Sections 5.3.2.1.2 and 5.3.2.1.3, Pages 5.3-23, 5.3-24; Appendix 5.3 B Technical Report Pages 31–33, 71</p> <p>The architectural field survey was provided as TN 243019, Historic Resources Evaluation Report, as an Addendum to the original Cultural Resources Technical Report Appendix 5.3B.</p>	No Yes	<p>The AFC section does not discuss the resources identified by the survey, nor does it clearly route the reader to Appendix 5.3B for the discussion. No architectural field survey was performed. A built environment inventory was compiled, but there was no discussion of the methodology for creating this inventory in the survey methods section 6.1 of Appendix 5.3 B and no discussion of these resources was provided in the Architectural History Survey Results section of Appendix 5.3 B. Add a discussion of the background research methodology for compiling the Historic Built Environment Resources inventory in the study area to the Methods Section 6.1 in Appendix 5.3 B. Conduct and include results of an architectural field survey in Section 6.1 of Appendix 5.3B and summarize the methods and results in Section 5.3. Include a summary of the results of the archaeological survey in Section 5.3.</p>

Adequacy Issue: Adequate Inadequate

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Revision No. 1 Date June 29, 2022

Technical Area: Cultural Resources

Project: Gem Energy Storage Center

Technical Staff: Melissa Mourkas, Cameron Travis

Project Manager: Leonidas Payne

Docket: 21-AFC-02

Technical Senior: Gabriel Roark

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (2) (C) (iii)	Copies of all new and updated DPR 523(A) forms. If a cultural resource may be impacted by the project, also include the appropriate DPR 523 detail form for each such resource;	<p>Confidential Appendix 5.3D</p> <p>Information provided under confidential cover. TNs 243639-243671, 243425, and 243742.</p> <p>The architectural field survey was provided as TN 243019, Historic Resources Evaluation Report, as an Addendum to the original Cultural Resources Technical Report Appendix 5.3B.</p>	No Yes	Please provide DPR 523 forms for historic built environment resources recorded in the architectural study area.

Adequacy Issue: Adequate Inadequate

DATA ADEQUACY WORKSHEET

Revision No. 1 Date June 29, 2022

Technical Area: Cultural Resources

Project: Gem Energy Storage Center

Technical Staff: Melissa Mourkas, Cameron Travis

Project Manager: Leonidas Payne

Docket: 21-AFC-02

Technical Senior: Gabriel Roark

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (2) (C) (iv)	A map at a scale of 1:24,000 U.S. Geological Survey quadrangle depicting the locations of all previously known and newly identified cultural resources compiled through the research required by Appendix B (g)(2)(B) and Appendix B (g)(2)(C) (ii); and	<p>Confidential Appendices 5.3A and 5.3C</p> <p>Information provided under confidential cover. TNs 243639-243671, 243425, and 243742.</p> <p>The architectural field survey was provided as TN 243019, Historic Resources Evaluation Report, as an Addendum to the original Cultural Resources Technical Report Appendix 5.3B.</p>	No Yes	<p>Please map and label the locations of archaeological sites 21-0546-GG-012H and 21-0546-GG-020H.</p> <p>Please map the locations of newly identified historic built environment resources.</p> <p>The following resources listed in Appendix 5.3 B Technical Report Table 4-2 are not mapped or are mislabeled. Please map and label the resources: P-15-014602, P-15-014893, P-15-017852, P-15-018364 (possible typo, labeled as 048364 on Sheet 2?), P-15-018681, P-15-019543, P-15-019584, P-15-019848, P-15-019849.</p> <p>Appendix A, RS Results-Resources Sheet 3: An unknown resource label is obscured by the label for P-15-019551.</p> <p>Appendix A, RS Result-Resources Sheet 2: A resource is mapped and labeled as P-15-018246 but is not listed in Table 4-2. Please add to Table 2 and provide the associated DPR form.</p>

Adequacy Issue: Adequate Inadequate

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Revision No. 1 Date June 29, 2022

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Project: Gem Energy Storage Center

Technical Staff: Melissa Mourkas, Cameron Travis

Project Manager: Leonidas Payne

Docket: 21-AFC-02

Technical Senior: Gabriel Roark

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (2) (C) (v)	The names and qualifications of the cultural resources specialists who contributed to and were responsible for literature searches, surveys, and preparation of the technical report.	AFC Section 5.3, Pages 5.3-4, Section 5.3.2.1.2, Page 5.3-23; Appendix 5.3C	Yes	
Appendix B (g) (2) (D)	Provide a copy of your request to the Native American Heritage Commission (NAHC) for information on Native American sacred sites and lists of Native Americans interested in the project vicinity, and copies of any correspondence received from the NAHC. Notify the Native Americans on the NAHC list about the project, including a project description and map. Provide a copy of all correspondence sent to Native American individuals and groups listed by the NAHC and copies of all responses. Provide a written summary of any oral responses.	Section 5.3.2.1.4, Page 5.3-24; AFC Appendix 5.3A	Yes	Although Appendix 5.3A does not contain a copy of each letter sent to tribes, it does provide the letter text, contact list, correspondence log, and copies of all email and telephone correspondence. Staff regards these items as functionally equivalent to the Appendix B(g)(2)(D).
Appendix B (g) (2) (E)	Include in the discussion of proposed mitigation measures required by subdivision (g)(1):			
Appendix B (g) (2) (E) (i)	A discussion of measures proposed to mitigate project impacts to known cultural resources;	Section 5.3.5, Pages 5.3-24 to 5.3-27 and Appendix 5.3 B Technical Report Pages 74–79.	Yes	
Appendix B (g) (2) (E) (ii)	A set of contingency measures proposed to mitigate potential impacts to previously unknown cultural resources and any unanticipated impacts to known cultural resources; and	Section 5.3.5, Pages 5.3-25 to 5.3-27 and Appendix 5.3 B Technical Report Pages 77–79.	Yes	
Appendix B (g) (2) (E) (iii)	Educational programs to enhance employee awareness during construction and operation to protect cultural resources.	Section 5.3.5.1.2 and Appendix 5.3 B Technical Report Pages 77–78.	Yes	

Adequacy Issue: Adequate Inadequate

DATA ADEQUACY WORKSHEET

Revision No. 1 Date June 29, 2022

Technical Area: Cultural Resources

Project: Gem Energy Storage Center

Technical Staff: Melissa Mourkas, Cameron Travis

Project Manager: Leonidas Payne

Docket: 21-AFC-02

Technical Senior: Gabriel Roark

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (i) (1) (A)	Tables which identify laws, regulations, ordinances, standards, adopted local, regional, state, and federal land use plans, leases, and permits applicable to the proposed project, and a discussion of the applicability of, and conformance with each. The table or matrix shall explicitly reference pages in the application wherein conformance, with each law or standard during both construction and operation of the facility is discussed; and	Section 5.3.6, Pages 5.3-27 through 5.3-30, Table 5.3-3.	Yes	
Appendix B (i) (1) (B)	Tables which identify each agency with jurisdiction to issue applicable permits, leases, and approvals or to enforce identified laws, regulations, standards, and adopted local, regional, state and federal land use plans, and agencies which would have permit approval or enforcement authority, but for the exclusive authority of the commission to certify sites and related facilities.	Section 5.3.8, Page 5.3-31.	Yes	
Appendix B (i) (2)	The name, title, phone number, address (required), and email address (if known), of an official who was contacted within each agency, and also provide the name of the official who will serve as a contact person for Commission staff.	Section 5.3.7, Table 5.3-4, Page 5.3-30 and Appendix 5.3A.	Yes	No contact name provided for NAHC. However, the response letter from NAHC dated August 24, 2021, Appendix 5.3A, provides the NAHC contact name. Staff regards this item as functionally equivalent to the Appendix B (i) (2) requirement.
Appendix B (i) (3)	A schedule indicating when permits outside the authority of the commission will be obtained and the steps the applicant has taken or plans to take to obtain such permits.	Section 5.3.8, Page 5.3-31.	Yes	

Adequacy Issue: Adequate Inadequate
 Technical Area: Efficiency - Energy Resources
 Project Manager: Leonidas Payne

DATA ADEQUACY WORKSHEET

Revision No. 1 Date May 2022
 Technical Staff: Ken Salyphone
 Technical Senior: Shahab Khoshmashrab

Project: Gem Energy Storage Center
 Docket: 21-AFC-02

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (1)	...provide a discussion of the existing site conditions, the expected direct, indirect and cumulative impacts due to the construction, operation and maintenance of the project, the measures proposed to mitigate adverse environmental impacts of the project, the effectiveness of the proposed measures, and any monitoring plans proposed to verify the effectiveness of the mitigation.	Section 1.3 Section 2.1 Section 2.1.7 Section 4.0	Yes	
Appendix B (h) (4) (A)	Heat and mass balance diagrams for design conditions for each mode of operation.	Sections 2.1.2 – 2.1.14.6 Appendix 2 C See TN# 242776 GEM_Data Adequacy Master Response No 1. Electric heaters would consume a total average of 750 kW.	No Yes	Source of power for the heat exchanger(s) is electric heater. How much power do the heat exchangers need in order to operate?
Appendix B (h) (4) (B)	Annual fuel consumption in BTUs for each mode of operation, including hot restarts and cold starts.	Section 2.1.3 Section 2.1.4 Section 2.1.5 Section 2.1.6 Section 5.1.3.2 Table 5.1-2	Yes	
Appendix B (h) (4) (C)	Annual net electrical energy produced in MWh for each mode of operation including starts and shutdowns.	Section 1.5 Section 2.0 Section 2.1.4 Section 2.1.5 Section 2.1.6	Yes	
Appendix B (h) (4) (D)	Number of hours the plant will be operated in each design condition in each year.	Section 1.5 Section 2.1.4 Section 5.1.3.2 Table 5.1-2	Yes	
Appendix B (h) (4) (E)	If the project will be a cogeneration facility, calculations showing compliance with applicable efficiency and operating standards.	N/A		

Adequacy Issue: Adequate Inadequate
 Technical Area: Efficiency - Energy Resources
 Project Manager: Leonidas Payne

DATA ADEQUACY WORKSHEET

Revision No. 1 Date May 2022
 Technical Staff: Ken Salyphone
 Technical Senior: Shahab Khoshmashrab

Project: Gem Energy Storage Center
 Docket: 21-AFC-02

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (h) (4) (F)	A discussion of alternative generating technologies available for the project, including the projected efficiency of each, and an explanation why the chosen equipment was selected over these alternatives.	Section 6.0	Yes	
Appendix B (i) (1) (A)	Tables which identify laws, regulations, ordinances, standards, adopted local, regional, state, and federal land use plans, leases, and permits applicable to the proposed project, and a discussion of the applicability of, and conformance with each. The table or matrix shall explicitly reference pages in the application wherein conformance, with each law or standard during both construction and operation of the facility is discussed; and	N/A		
Appendix B (i) (1) (B)	Tables which identify each agency with jurisdiction to issue applicable permits, leases, and approvals or to enforce identified laws, regulations, standards, and adopted local, regional, state and federal land use plans, and agencies which would have permit approval or enforcement authority, but for the exclusive authority of the commission to certify sites and related facilities.	N/A		
Appendix B (i) (2)	The name, title, phone number, address (required), and email address (if known), of an official who was contacted within each agency, and also provide the name of the official who will serve as a contact person for Commission staff.	N/A		
Appendix B (i) (3)	A schedule indicating when permits outside the authority of the commission will be obtained and the steps the applicant has taken or plans to take to obtain such permits.	N/A		

Adequacy Issue: Adequate Inadequate
 Technical Area: Geological Hazards
 Project Manager: Leonidas Payne

DATA ADEQUACY WORKSHEET

Revision No. 1 Date April 2022
 Technical Staff: Garry Maurath
 Technical Senior: Shahab Khoshmashrab

Project: Gem Energy Storage Center
 Docket: 21-AFC-02

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (1)	...provide a discussion of the existing site conditions, the expected direct, indirect and cumulative impacts due to the construction, operation and maintenance of the project, the measures proposed to mitigate adverse environmental impacts of the project, the effectiveness of the proposed measures, and any monitoring plans proposed to verify the effectiveness of the mitigation.	Section 5.4 Geological Hazards and Resources; Pages 5.4-1 through 5.4-15 Section 5.8 Paleontological Resources; Pages 5.8-1 through 5.8-11 Section 5.11 Soils; Pages 5.11-1 through 5.11-9	Yes	
Appendix B (g) (17) (A)	A summary of the geology, seismicity, and geologic resources of the project site and related facilities, including linear facilities.	Section 5.4 Geological Hazards and Resources; Pages 5.4-1 through 5.4-12	Yes	
Appendix B (g) (17) (B)	A map at a scale of 1:24,000 and description of all recognized stratigraphic units, geologic structures, and geomorphic features within two (2) miles of the project site and along proposed facilities. Include an analysis of the likelihood of ground rupture, seismic shaking, mass wasting and slope stability, liquefaction, subsidence, tsunami runup, and expansion or collapse of soil structures at the plant site. Describe known geologic hazards along or crossing linear facilities.	Section 5.4 Geological Hazards and Resources; Pages 5.4-1 through 5.4-12 Section 5.8 Paleontological Resources; Pages 5.8-1 through 5.8-11 TN242792	No Yes	Missing map and discussion of stratigraphy. There is some discussion of stratigraphy as it relates to paleontology in Section 5.8, but it is insufficient for analysis of shafts and caverns.

Adequacy Issue: Adequate Inadequate

DATA ADEQUACY WORKSHEET

Revision No. 1 Date April 2022

Technical Area: Geological Hazards

Project: Gem Energy Storage Center

Technical Staff: Garry Maurath

Project Manager: Leonidas Payne

Docket: 21-AFC-02

Technical Senior: Shahab Khoshmashrab

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (17) (C)	A map and description of geologic resources of recreational, commercial, or scientific value which may be affected by the project. Include a discussion of the techniques used to identify and evaluate these resources.	Subsection 5.4.1.5; Pages 5.4-10 through 5.4-12	Yes	
Appendix B (i) (1) (A)	Tables which identify laws, regulations, ordinances, standards, adopted local, regional, state, and federal land use plans, leases, and permits applicable to the proposed project, and a discussion of the applicability of, and conformance with each. The table or matrix shall explicitly reference pages in the application wherein conformance, with each law or standard during both construction and operation of the facility is discussed; and	Subsection 5.4.5 Laws, Ordinances, Regulations, and Standards; Pages 5.4-15 through 5.4-16	Yes	
Appendix B (i) (1) (B)	Tables which identify each agency with jurisdiction to issue applicable permits, leases, and approvals or to enforce identified laws, regulations, standards, and adopted local, regional, state and federal land use plans, and agencies which would have permit approval or enforcement authority, but for the exclusive authority of the commission to certify sites and related facilities.	Subsection 5.4.5 Laws, Ordinances, Regulations, and Standards; Pages 5.4-15 through 5.4-16	Yes	

Adequacy Issue: Adequate Inadequate
 Technical Area: Geological Hazards
 Project Manager: Leonidas Payne

DATA ADEQUACY WORKSHEET

Revision No. 1 Date April 2022
 Technical Staff: Garry Maurath
 Technical Senior: Shahab Khoshmashrab

Project: Gem Energy Storage Center
 Docket: 21-AFC-02

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (i) (2)	The name, title, phone number, address (required), and email address (if known), of an official who was contacted within each agency, and also provide the name of the official who will serve as a contact person for Commission staff.	Subsection 5.4.5 Laws, Ordinances, Regulations, and Standards; Pages 5.4-15 through 5.4-16 TN242776	No Yes	Missing contact information of responsible individual in DSOD who will be overseeing design, construction, and safety of the jurisdictional dam creating the compensation reservoir.
Appendix B (i) (3)	A schedule indicating when permits outside the authority of the commission will be obtained and the steps the applicant has taken or plans to take to obtain such permits.	Subsection 5.4.7 Permits and Permit Schedule; Page 5.4-16	Yes	

Adequacy Issue: Adequate Inadequate

DATA ADEQUACY WORKSHEET

Revision No. 1 Date May 2022

Technical Area: Land Use
 Project Manager: Leonidas Payne

Project: Gem Energy Storage Center
 Docket: 21-AFC-01

Technical Staff: Andrea Koch
 Technical Senior: Steve Kerr

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (1)	...provide a discussion of the existing site conditions, the expected direct, indirect and cumulative impacts due to the construction, operation and maintenance of the project, the measures proposed to mitigate adverse environmental impacts of the project, the effectiveness of the proposed measures, and any monitoring plans proposed to verify the effectiveness of the mitigation.	Page 5-6-5, Section 5.6.1.1; Pages 5-6-22 to 5-6-32, Section 5.6.2; Pages 5-6-32 to 5-6-33, Section 5.6.3; Page 5-6-33, Section 5.6.4	Yes.	
Appendix B (g) (3) (A)	A discussion of existing land uses and current zoning at the site, land uses and land use patterns within one mile of the proposed site and within one-quarter mile of any project-related linear facilities. Include:	Page 5-6-5, Section 5.6.1.1; Pages 5-6-14 to 5-6-18, Section 5.6.1.3; Page 5-6-18, Section 5.6.1.4; Pages 5-6-18 to 5-6-21, Section 5.6.1.5; Page 5-6-21, Section 5.6.1.6	Yes	
Appendix B (g) (3) (A) (i)	An identification of residential, commercial, industrial, recreational, scenic, agricultural, natural resource protection, natural resource extraction, educational, religious, cultural, and historic areas, and any other area of unique land uses;	Page 5-6-5, Section 5.6.1; Pages 5-6-9 to 5-6-14, Section 5.6.1.2	Yes	
Appendix B (g) (3) (A) (ii)	A discussion of any recent or proposed zone changes and/or general plan amendments; noticed by an elected or appointed board, commission, or similar entity at the state or local level;	Page 5-6-21, Section 5.6.1.7	Yes	
Appendix B (g) (3) (A) (iii)	Identification of all discretionary reviews by public agencies initiated or completed within 18 months prior to filing the application for those changes or developments identified in subsection (g)(3)(A)(ii); and	Page 5-6-21, Section 5.6.1.8	Yes	

Adequacy Issue: Adequate Inadequate

DATA ADEQUACY WORKSHEET

Revision No. 1 Date May 2022

Technical Area: Land Use
 Project Manager: Leonidas Payne

Project: Gem Energy Storage Center
 Docket: 21-AFC-01

Technical Staff: Andrea Koch
 Technical Senior: Steve Kerr

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (3) (A) (iv)	Legible maps of the areas identified in subsection (g)(3)(A) potentially affected by the project, on which existing land uses, jurisdictional boundaries, general plan designations, specific plan designations, and zoning have been clearly delineated.	Page 5-6-15, Figure 5.6-6	No Yes. Provided in TN 242776.	Please update Figure 5.6-6 with the proposed transmission lines (preferred and alternates). Please also include project maps showing the Willow Springs Specific Plan designations and the Kern County zoning designations (and include the proposed transmission lines). Updated figures were submitted as requested.
Appendix B (g) (3) (B)	A discussion of the compatibility of the proposed project with present and expected land uses, and conformity with any long-range land use plans adopted by any federal, state, regional, or local planning agencies. The discussion shall identify the need, if any, for land use decisions by another public agency or as part of the commission's decision that would be necessary to make the project conform to adopted federal, state, regional, or local coastal plans, land use plans, or zoning ordinances. Examples of land use decisions include: general plan amendments, zoning changes, lot line adjustments, parcel mergers, subdivision maps, Agricultural Land Conservation Act contracts cancellation, and Airport Land Use Plan consistency determinations.	Pages 5-6-22 to 5-6-32, Section 5.6.2	Yes	
Appendix B (g) (3) (C)	A discussion of the legal status of the parcel(s) on which the project is proposed. If the proposed site consists of more than one legal parcel, describe the method and timetable for merging or otherwise combining those parcels so that the proposed project, excluding linears and temporary laydown or staging area, will be located on a single legal parcel. The merger need not occur prior to a decision on the Application but must be completed prior to the start of construction.	Page 1-5, Section 1.2; Page 5-6-5, Section 5.6.1.1; Page 5-6-7, Section 5.6.1.1	No Yes. Provided in TN 242776.	Please describe the method and timetable for merging the two project parcels so that the proposed project, excluding linears and temporary laydown or staging areas, will be located on a single legal parcel. The applicant stated that there are no current plans to merge the two project parcels, and that no legal processes exist to merge a leasehold parcel with a parcel owned in fee simple.

Adequacy Issue: Adequate Inadequate

DATA ADEQUACY WORKSHEET

Revision No. 1 Date May 2022

Technical Area: Land Use
 Project Manager: Leonidas Payne

Project: Gem Energy Storage Center
 Docket: 21-AFC-01

Technical Staff: Andrea Koch
 Technical Senior: Steve Kerr

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (3) (D)	A map at a scale of 1:24,000 and written description of agricultural land uses found within all areas affected by the proposed project. The description shall include:	Page 5-6-12, Figure 5.6-5	No Yes. Provided in TN 242776.	Please add the proposed transmission lines to Figure 5.6-5 (preferred route and alternate routes). The figure was modified as requested.
Appendix B (g) (3) (D) (i)	Crop types, irrigation systems, and any special cultivation practices;	Page 5-6-5, Section 5.6.1	Yes	
Appendix B (g) (3) (D) (ii)	Whether farmland affected by the project is prime, of statewide importance, or unique as defined by the California Department of Conservation; and	Page 5-6-10, Section 5.6.1.2.4	Yes	
Appendix B (g) (3) (D) (iii)	Direct, indirect, and cumulative effects on agricultural land uses. If the proposed site or related facilities are subject to an Agricultural Land Conservation contract, provide a written copy and a discussion of the status of the expiration or canceling of such contract.	Page 5-6-32, Sections 5.6.2.2.4 and 5.6.2.2.5; Pages 5-6-32 to 5-6-33, Section 5.6.3	Yes	
Appendix B (i) (1) (A)	Tables which identify laws, regulations, ordinances, standards, adopted local, regional, state, and federal land use plans, leases, and permits applicable to the proposed project, and a discussion of the applicability of, and conformance with each. The table or matrix shall explicitly reference pages in the application wherein conformance, with each law or standard during both construction and operation of the facility is discussed; and	Pages 5-6-23 to 5-6-31, Section 5.6.2.2; Pages 5-6-33 to 5-6-34, Section 5.6.5	Yes	

Adequacy Issue: Adequate Inadequate

DATA ADEQUACY WORKSHEET

Revision No. 1 Date May 2022

Technical Area: Land Use
 Project Manager: Leonidas Payne

Project: Gem Energy Storage Center
 Docket: 21-AFC-01

Technical Staff: Andrea Koch
 Technical Senior: Steve Kerr

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (i) (1) (B)	Tables which identify each agency with jurisdiction to issue applicable permits, leases, and approvals or to enforce identified laws, regulations, standards, and adopted local, regional, state and federal land use plans, and agencies which would have permit approval or enforcement authority, but for the exclusive authority of the commission to certify sites and related facilities.	Page 5-6-34, Table 5.6-5	Yes	
Appendix B (i) (2)	The name, title, phone number, address (required), and email address (if known), of an official who was contacted within each agency, and also provide the name of the official who will serve as a contact person for Commission staff.	Page 5-6-34, Section 5.6.6	Yes	
Appendix B (i) (3)	A schedule indicating when permits outside the authority of the commission will be obtained and the steps the applicant has taken or plans to take to obtain such permits.	Page 5-6-35, Section 5.6.7	No Yes. Provided in TN 242776.	Please describe any discussions with Kern County about obtaining their determination on whether the project would meet the required findings for a conditional use permit. Please include a schedule of any future steps regarding this process. The applicant stated they have conducted preliminary conversations with the County Planning Director regarding conformity determinations and the County's overall review. The applicant has submitted the initial deposit of funds to the County to support the County's review and participation in the CEC process. The County indicated that any further review will occur in response to the CEC's request for review and comment.

Adequacy Issue: Adequate Inadequate

DATA ADEQUACY WORKSHEET

Revision No. 1 Date May 2022

Project Overview

Project: Gem Energy Storage Center

Technical Staff: Leonidas Payne/Ken Salyphone/Laiping Ng

Technical Area: _____

Docket: 21-AFC-01

Technical Senior: Eric Knight

Project Manager: Leonidas Payne

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Cal. Code Regs., tit. 20, § 1704, (a) (3) (A)	Descriptions of all significant assumptions, methodologies, and computational methods used in arriving at conclusions in the document.	Sections 5.1 - 5.16	Yes	
Cal. Code Regs., tit. 20, § 1704, (a) (3) (B)	Descriptions, including methodologies and findings, of all major studies or research efforts undertaken and relied upon to provide information for the document; and a description of ongoing research of significance to the project (including expected completion dates; and	Sections 5.1 - 5.16	Yes	
Cal. Code Regs., tit. 20, § 1704, (a) (3) (C)	A list of all literature relied upon or referenced in the documents, along with brief discussions of the relevance of each such reference	Sections 5.1 - 5.16	Yes	
Cal. Code Regs., tit. 20, § 1704, (a) (4)	Each principal subject area covered in a notice or application shall be set forth in a separate chapter or section, each of which shall identify the person or persons responsible for its preparation.	Sections 5.1 - 5.16 and Appendix 1C	Yes	
Appendix B (a) (1) (A)	A general description of the proposed site and related facilities, including the location of the site or transmission routes, the type, size and capacity of the generating or transmission facilities, fuel characteristics, fuel supply routes and facilities, water supply routes and facilities, pollution control systems, and other general characteristics.	Section 2	Yes	
Appendix B (a) (1) (B)	Identification of the location of the proposed site and related facilities by section, township, range, county and assessor's parcel numbers.	Section 1.2	Yes	
Appendix B (a) (1) (C)	A description of and maps depicting the region, the vicinity, and the site and its immediate surroundings.	Section 1.2, Figures 1-3 and 1-4	Yes	

Adequacy Issue: Adequate Inadequate

DATA ADEQUACY WORKSHEET

Revision No. 1 Date May 2022

Project Overview

Project: Gem Energy Storage Center

Technical Staff: Leonidas Payne/Ken Salyphone/Laiping Ng

Technical Area: _____

Docket: 21-AFC-01

Technical Senior: Eric Knight

Project Manager: Leonidas Payne

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (a) (1) (D)	A full-page color photographic reproduction depicting the visual appearance of the site prior to construction, and a full-page color simulation or artist's rendering of the site and all project components at the site, after construction.	Section 1.0, Figures 1-1 and 1-2	Yes	
Appendix B (a) (1) (E)	In an appendix to the application, a list of current assessor's parcel numbers and owners' names and addresses for all parcels within 500 feet of the proposed transmission line and other linear facilities, and within 1000 feet of the proposed powerplant and related facilities.	Appendix 1B	Yes	
Appendix B (a) (2)	Project Schedule: Proposed dates of initiation and completion of construction, initial start-up, and full-scale operation of the proposed facilities.	Sections 1.7 and 2.1.21.1	Yes	
Appendix B (a) (3) (A)	A list of all owners and operators of the site(s), the power plant facilities, and, if applicable, thermal host, the geothermal leasehold, the geothermal resource conveyance lines, and the geothermal re-injection system, and a description of their legal interest in these facilities.	Section 1.6	Yes	
Appendix B (a) (3) (B)	A list of all owners and operators of the proposed electric transmission facilities.	Sections 2.0 and 2.1.20	Yes	
Appendix B (a) (3) (C)	A description of the legal relationship between the applicant and each of the persons or entities specified in subsections (a)(3)(A) and (B).	Sections 1.6 and 3.3	Yes	

Adequacy Issue: Adequate Inadequate

DATA ADEQUACY WORKSHEET

Revision No. 1 Date May 2022

Project Overview

Project: Gem Energy Storage Center

Technical Staff: Leonidas Payne/Ken Salyphone/Laiping Ng

Technical Area: _____

Project Manager: Leonidas Payne

Docket: 21-AFC-01

Technical Senior: Eric Knight

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (b) (1)	In a section entitled, "Generation Facility Description, Design, and Operation" provide the following information:	-----	-----	-----
Appendix B (b) (1) (A)	Maps at a scale of 1:24,000 (1" = 2000'), (or appropriate map scale agreed to by staff) along with an identification of the dedicated leaseholds by section, township, range, county, and county assessor's parcel number, showing the proposed final locations and layout of the power plant and all related facilities;	Fig 2-1 Fig 2-2 Fig 5.6-3	Yes	
Appendix B (b) (1) (B)	Scale plan and elevation drawings depicting the relative size and location of the power plant and all related facilities to establish the accuracy of the photo simulations required in Sections (a)(1)(D) and (g)(6)(F);	Fig 2-3 Fig 2-4 Fig 2-5 Fig 2-6	Yes	
Appendix B (b) (1) (C)	A detailed description of the design, construction and operation of the facilities, specifically including the power generation, cooling, water supply and treatment, waste handling and control, pollution control, fuel handling, and safety, emergency and auxiliary systems, and fuel types and fuel use scenarios; and	Section 2.0 See TN# 242776 Data Adequacy Master Response No. 1. And TN# 240770 Gem Energy Storage Center Data Adequacy Supplemental No. 1 Section 2.0 Project Description. Supersedes TN# 240751-3	No Yes	The California Independent System Operator's grid interconnection queue webpage shows a 108 MW battery as part of the Gem project, also connecting to SCE's Whirlwind Substation. The AFC does not provide a description of the design, construction, and operation of this project component. If Gem includes a battery component, please revise Section 2.0 accordingly, as well as all other affected sections of the AFC (e.g., environmental impact discussions).
Appendix B (b) (1) (D)	A description of how the site and related facilities were selected and the consideration given to engineering constraints, site geology, environmental impacts, water, waste and fuel constraints, electric transmission constraints, and any other factors considered by the applicant.	Section 6.0	Yes	

Adequacy Issue: Adequate Inadequate

DATA ADEQUACY WORKSHEET

Revision No. 1 Date May 2022

Project Overview

Project: Gem Energy Storage Center

Technical Staff: Leonidas Payne/Ken Salyphone/Laiping Ng

Technical Area: _____

Project Manager: Leonidas Payne

Docket: 21-AFC-01

Technical Senior: Eric Knight

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (b) (2)	In a section entitled, "Transmission Lines Description, Design, and Operation" provide the following information:	-----	-----	-----
Appendix B (b) (2) (A)	Maps at a scale of 1:24,000 (or appropriate map scale agreed to by staff) of each proposed transmission line route, showing the settled areas, parks, recreational areas, scenic areas, and existing transmission lines within one mile of the proposed route(s);	Fig. 1-4 Fig.5.6.2, Fig. 5.6.3 Fig. 5.13-1, Fig. 5.13.2 Section 5.13	Yes	
Appendix B (b) (2) (B)	A full-page color photographic reproduction depicting a representative above ground section of the transmission line route prior to construction and a full-page color photographic simulation of that section of the transmission line route after construction.	Appendix 5.13A Fig. 5.13A-2 to Fig 5.13A-15	Yes	
Appendix B (b) (2) (C)	A detailed description of the design, construction, and operation of any electric transmission facilities, such as power lines, substations, switchyards, or other transmission equipment, which will be constructed or modified to transmit electrical power from the proposed power plant to the load centers to be served by the facility. Such description shall include the width of rights-of-way and the physical and electrical characteristics of electrical transmission facilities such as towers, conductors, and insulators.	Section 3.0 Page 3-1 Section 3.2 to Section 3.2.3 Page 3-1 to 3-7 Figure 3-1 to Figure 3-4 TN#242776 GEM DA Master Response No.1 Gem Energy Storage Center Data Adequacy Supplemental No. 1 Section 3.0	No Yes	A complete project description includes drawings of the changes required at the interconnecting substation, SCE's Whirlwind Substation. Detailed one-line diagrams of the Whirlwind Substation before the proposed project and after the proposed project would interconnect should be included as well as any potential changes to the existing fence line at the Whirlwind Substation.

Adequacy Issue: Adequate Inadequate

DATA ADEQUACY WORKSHEET

Revision No. 1 Date May 2022

Project Overview

Project: Gem Energy Storage Center

Technical Staff: Leonidas Payne/Ken Salyphone/Laiping Ng

Technical Area: _____

Project Manager: Leonidas Payne

Docket: 21-AFC-01

Technical Senior: Eric Knight

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (b) (2) (D)	A description of how the route and additional transmission facilities were selected, and the consideration given to engineering constraints, environmental impacts, resource conveyance constraints, and electric transmission constraints; and	Section 2.0 Page 2-2 Figure 2.1 to Figure 2.2 Section 3.1 Page 3-1	Yes	
Appendix B (e) (1)	A discussion of how facility closure will be accomplished in the event of premature or unexpected cessation of operations.	Section 2.2.9 Section 2.2.10 Section 2.2.11	Yes	

Adequacy Issue: Adequate Inadequate

DATA ADEQUACY WORKSHEET

Revision No. 1 Date May 2022

Technical Area: Reliability

Project: Gem Energy Storage Center

Technical Staff: Ken Salyphone

Project Manager: Leonidas Payne

Docket: 21-AFC-02

Technical Senior: Shahab Khoshmashrab

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (1)	...provide a discussion of the existing site conditions, the expected direct, indirect and cumulative impacts due to the construction, operation and maintenance of the project, the measures proposed to mitigate adverse environmental impacts of the project, the effectiveness of the proposed measures, and any monitoring plans proposed to verify the effectiveness of the mitigation.	Section 1.2 Section 1.4 Section 1.5 Section 5.0	Yes	
Appendix B (h) (3) (A)	A discussion of the sources and availability of the fuel or fuels to be used over the estimated service life of the facilities.	Section 2.2.4 Section 5.1.3.2	Yes	
Appendix B (h) (3) (B)	A discussion of the anticipated service life and degree of reliability expected to be achieved by the proposed facilities based on a consideration of:	Section 2.2 Section 2.2.2 Section 2.2.2.1	Yes	
Appendix B (h) (3) (B) (i)	Expected overall availability factor, and annual and lifetime capacity factors;	Section 1.5 Section 2.2.2 Section 2.2.2.1	Yes	
Appendix B (h) (3) (B) (ii)	The demonstrated or anticipated feasibility of the technologies, systems, components, and measures proposed to be employed in the facilities, including the power generation system, the heat dissipation system, the water supply system, the reinjection system, the atmospheric emission control system, resource conveyance lines, and the waste disposal system;	Section 1.3 Section 1.5 Section 2.1 Sections 2.1.3 - 2.1.9	Yes	
Appendix B (h) (3) (B) (iii)	Geologic and flood hazards, meteorologic conditions and climatic extremes, and cooling water availability;	Section 1.1 Section 5.4 Section 5.6 Section 5.11	Yes	
Appendix B (h) (3) (B) (iv)	Special design features adopted by the applicant or resource supplier to ensure power plant reliability including equipment redundancy; and	Section 2.2.3 Section 2.2.3.1 Sections 2.2.3.2 - 2.2.3.4	Yes	

Adequacy Issue: Adequate Inadequate

DATA ADEQUACY WORKSHEET

Revision No. 1 Date May 2022

Technical Area: Reliability

Project: Gem Energy Storage Center

Technical Staff: Ken Salyphone

Project Manager: Leonidas Payne

Docket: 21-AFC-02

Technical Senior: Shahab Khoshmashrab

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (h) (3) (B) (v)	For technologies not previously installed and operated in California, the expected power plant maturation period.	<p>TN# 242776: GEM_Data Adequacy Master Response No 1.</p> <p>TN# 242799: DA20-1 ACAES Historical Operational Summary for historical data.</p>	No-Yes	<p>Provide the make and model of the air compression drive trains and the air expansion turbine generators.</p> <p>Provide historical operational data for the A-CAES technology by Hydrostor that shows successful operation of this technology for the time period pertaining to the data.</p>
Appendix B (i) (1) (A)	Tables which identify laws, regulations, ordinances, standards, adopted local, regional, state, and federal land use plans, leases, and permits applicable to the proposed project, and a discussion of the applicability of, and conformance with each. The table or matrix shall explicitly reference pages in the application wherein conformance, with each law or standard during both construction and operation of the facility is discussed; and	N/A		
Appendix B (i) (1) (B)	Tables which identify each agency with jurisdiction to issue applicable permits, leases, and approvals or to enforce identified laws, regulations, standards, and adopted local, regional, state and federal land use plans, and agencies which would have permit approval or enforcement authority, but for the exclusive authority of the commission to certify sites and related facilities.	N/A		
Appendix B (i) (2)	The name, title, phone number, address (required), and email address (if known), of an official who was contacted within each agency, and also provide the name of the official who will serve as a contact person for Commission staff.	N/A		

Adequacy Issue: Adequate Inadequate

DATA ADEQUACY WORKSHEET

Revision No. 1 Date May 2022

Technical Area: Reliability

Project: Gem Energy Storage Center

Technical Staff: Ken Salyphone

Project Manager: Leonidas Payne

Docket: 21-AFC-02

Technical Senior: Shahab Khoshmashrab

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (i) (3)	A schedule indicating when permits outside the authority of the commission will be obtained and the steps the applicant has taken or plans to take to obtain such permits.	N/A		

Adequacy Issue: Adequate Inadequate

DATA ADEQUACY WORKSHEET

Revision No. 1 Date May 2022

Technical Area: Socioeconomics
 Project Manager: Leonidas Payne

Project: Gem Energy Storage Center
 Docket: 21-AFC-02

Technical Staff: Ellen LeFevre
 Technical Senior: Steve Kerr

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (1)	...provide a discussion of the existing site conditions, the expected direct, indirect and cumulative impacts due to the construction, operation and maintenance of the project, the measures proposed to mitigate adverse environmental impacts of the project, the effectiveness of the proposed measures, and any monitoring plans proposed to verify the effectiveness of the mitigation.	Section 5.10.1 Page 5.10-1 Section 5.10.3 Page 5.10-23 Section 5.10.4 Page 5.10-23	Yes	
Appendix B (g) (7) (A)	A description of the socioeconomic circumstances of the vicinity and region affected by construction and operation of the project. Include:	Section 5.10.1.1 Pages 5.10-1 – 5.10-4 Figure 5.10-1 Page 5.10-3 Figure 5.10-2 Page 5.10-4	Yes	
Appendix B (g) (7) (A) (i)	The economic characteristics, including the economic base, fiscal resources, and a list of the applicable local agencies with taxing powers and their most recent and projected revenues;	Section 5.10.1.3 Pages 5.10-5 – 5.10-6 Section 5.10.1.4 Pages 5.10-6 – 5.10-7	Yes	
Appendix B (g) (7) (A) (ii)	The social characteristics, including population and demographic and community trends;	Section 5.10.1.1 Pages 5.10-1 – 5.10-2	Yes	
Appendix B (g) (7) (A) (iii)	Existing unemployment rates;	Section 5.10.1.3 Table 5.10-5 Page 5.10-6	Yes	
Appendix B (g) (7) (A) (iv)	Availability of skilled workers by craft required for construction and operation of the project;	Section 5.10.2.3.1 Table 5.10-10 Page 5.10-17	Yes	
Appendix B (g) (7) (A) (v)	Availability of temporary and permanent housing and current vacancy rate; and	Section 5.10.1.2 Page 5.10-5	Yes	

Adequacy Issue: Adequate Inadequate

DATA ADEQUACY WORKSHEET

Revision No. 1 Date May 2022

Technical Area: Socioeconomics
 Project Manager: Leonidas Payne

Project: Gem Energy Storage Center
 Docket: 21-AFC-02

Technical Staff: Ellen LeFevre
 Technical Senior: Steve Kerr

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (7) (A) (vi)	Capacities, existing and expected use levels, and planned expansion of utilities (gas, water and waste) and public services, including fire protection, law enforcement, emergency response, medical facilities, other assessment districts, and school districts. For projects outside metropolitan areas with a population of 500,000 or more, information for each school district shall include current enrollment and yearly expected enrollment by grade level groupings, excluding project-related changes for the duration of the project schedule.	Section 5.10.1.5 Pages 5.10-7 – 5.10-8 Section 5.10.1.6.1 Pages 5.10-8 – 5.10-10	Yes	
Appendix B (g) (7) (B)	A discussion of the socioeconomic impacts caused by the construction and operation of the project (note year of estimate, model, if used, and appropriate sources), including:	Section 5.10.2.3.4 Pages 5.10-18 – 5.10-19, Section 5.10.2.4 Pages 5.10-20 – 5.10-21, Section 5.10.2.3.5 Page 5.10-19	Yes	
Appendix B (g) (7) (B) (i)	An estimate of the number of workers to be employed each month by craft during construction, and for operations, an estimate of the number of permanent operations workers during a year;	Section 5.10.2.3.1 Table 5.10-8 Pages 5.10-8 – 5.10-16	Yes	
Appendix B (g) (7) (B) (ii)	An estimate of the percentage of non-local workers who will relocate to the project area to work on the project;	Section 5.10.2.3.3 Page 5.10-17, Section 5.10.2.4.2 Page 5.10-20	Yes	
Appendix B (g) (7) (B) (iii)	An estimate of the potential population increase caused directly and indirectly by the project;	Section 5.10.2.3.2 Page 5.10-17, Section 5.10.2.4.2 Page 5.10-20	Yes	
Appendix B (g) (7) (B) (iv)	The potential impact of population increase on housing during the construction and operations phases;	Section 5.10.2.3.3 Pages 5.10-17 – 5.10-18, Section 5.10.2.4.3 Page 5.10-21	Yes	

Adequacy Issue: Adequate Inadequate

DATA ADEQUACY WORKSHEET

Revision No. 1 Date May 2022

Technical Area: Socioeconomics
 Project Manager: Leonidas Payne

Project: Gem Energy Storage Center
 Docket: 21-AFC-02

Technical Staff: Ellen LeFevre
 Technical Senior: Steve Kerr

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (7) (B) (v)	The potential impacts, including additional costs, on utilities (gas, water, and waste) and public services, including fire, law enforcement, emergency response, medical facilities, other assessment districts, and school districts. Include response times to hospitals and for police, and emergency services. For projects outside metropolitan areas with a population of 500,000 or more, information on schools shall include project-related enrollment changes by grade level groupings and associated facility and staffing impacts by school district during the construction and operating phases;	Section 5.10.2.4.6 Page 5.10-22 Section 5.10.2.4.7 Page 5.10-22 Section 5.10.2.4.8 Page 5.10-22	Yes	
Appendix B (g) (7) (B) (vi)	An estimate of applicable school impact fees;	TN242776 Section 5.10.2.4.6 Page 5.10-22	No Yes	Provide estimate of school impact fee
Appendix B (g) (7) (B) (vii)	An estimate of the total construction payroll and separate estimates of the total operation payroll for permanent and short-term (contract) operations employees;	Section 5.10.2.3.4 Page 5.10-19 Section 5.10.2.4.4 Page 5.10-21	Yes	
Appendix B (g) (7) (B) (viii)	An estimate of the expenditures for locally purchased materials for the construction and operation phases of the project;	Section 5.10.2.3.4 Page 5.10-19 Section 5.10.2.4.4 Page 5.10-24 TN242776	No Yes	Provide estimate of expenditures for locally purchased materials for the operation phases of the project
Appendix B (g) (7) (B) (ix)	An estimate of the capital cost (plant and equipment) of the project;	Section 5.10.2.3.4 Page 5.10-15	Yes	
Appendix B (g) (7) (B) (x)	An estimate of sales taxes generated during construction and separately during an operational year of the project;	Section 5.10.2.3.4 Page 5.10-19 TN242776	No Yes	Provide an estimate of the sales tax generated during an operational year of the project
Appendix B (g) (7) (B) (xi)	An estimate of property taxes generated during an operational year of the project; and	Section 5.10.2.4.6 Page 5.10-22 TN242776	No Yes	Provide an estimate of property taxes generated during an operational year

Adequacy Issue: Adequate Inadequate

DATA ADEQUACY WORKSHEET

Revision No. 1 Date May 2022

Technical Area: Socioeconomics
 Project Manager: Leonidas Payne

Project: Gem Energy Storage Center
 Docket: 21-AFC-02

Technical Staff: Ellen LeFevre
 Technical Senior: Steve Kerr

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (7) (B) (xii)	The expected direct, indirect, and induced income and employment effects due to construction, operation, and maintenance of the project.	Section 5.10.2.3.4 Page 5.10-19 Section 5.10.2.4.4 Table 5.10-15 Page 5.10-22	Yes	
Appendix B (i) (1) (A)	Tables which identify laws, regulations, ordinances, standards, adopted local, regional, state, and federal land use plans, leases, and permits applicable to the proposed project, and a discussion of the applicability of, and conformance with each. The table or matrix shall explicitly reference pages in the application wherein conformance, with each law or standard during both construction and operation of the facility is discussed; and	Section 5.10.5 Table 5.10-16 Pages 5.10-24 – 5.10-25	Yes	
Appendix B (i) (1) (B)	Tables which identify each agency with jurisdiction to issue applicable permits, leases, and approvals or to enforce identified laws, regulations, standards, and adopted local, regional, state and federal land use plans, and agencies which would have permit approval or enforcement authority, but for the exclusive authority of the commission to certify sites and related facilities.	Section 5.10.7 Page 5.10-26	Yes	
Appendix B (i) (2)	The name, title, phone number, address (required), and email address (if known), of an official who was contacted within each agency, and also provide the name of the official who will serve as a contact person for Commission staff.	Section 5.10.6 Table 5.10-17 Pages 5.10-25 – 5.10-26	Yes	
Appendix B (i) (3)	A schedule indicating when permits outside the authority of the commission will be obtained and the steps the applicant has taken or plans to take to obtain such permits.	Section 5.10.7 Page 5.10-26	Yes	

Technical Area: Transmission System Design
 Project Manager: Leonidas Payne

Project: Gem Energy Storage Center
 Docket: 21-AFC-02

Technical Staff: Laiping Ng
 Technical Senior: Mark Hesters

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (h) (2) (A)	A discussion of the need for the additional electric transmission lines, substations, or other equipment, the basis for selecting principal points of junction with the existing electric transmission system, and the capacity and voltage levels of the proposed lines, along with the basis for selection of the capacity and voltage levels.	Section 2.0 Pages 2-1, 2-2 Section 2.1.14.2 Page 2-17 Section 2.1.20 Page 2-27	Yes	
Appendix B (h) (2) (B)	A discussion of the extent to which the proposed electric transmission facilities have been designed, planned, and routed to meet the transmission requirements created by additional generating facilities planned by the applicant or any other entity.	Section 1.0 Page 1-1 Section 1.3 Page 1-6 Section 2.1.14.2 Page 2-17	Yes	
Appendix B (b) (2) (C)	A detailed description of the design, construction, and operation of any electric transmission facilities, such as power lines, substations, switchyards, or other transmission equipment, which will be constructed or modified to transmit electrical power from the proposed power plant to the load centers to be served by the facility. Such description shall include the width of rights of way and the physical and electrical characteristics of electrical transmission facilities such as towers, conductors, and insulators.	Section 3.0 Page 3-1 Sections 3.2 to 3.2.3 Pages 3-1 to 3-7 Figures 3-1 to Figure 3-4 TN#242776 GEM DA Master Response No.1 Gem Energy Storage Center Data Adequacy Supplemental No. 1 Section 3.0	No Yes	A complete project description includes drawings of the changes required at the interconnecting substation, SCE's Whirlwind Substation. Detailed one-line diagrams of the Whirlwind Substation before the proposed project and after the proposed project would interconnect should be included as well as any potential changes to the existing fence line at the Whirlwind Substation.
Appendix B (b) (2) (D)	A description of how the route and additional transmission facilities were selected, and the consideration given to engineering constraints, environmental impacts, resource conveyance constraints, and electric transmission constraints.	Section 2.0 Page 2-2 Figures 2.1 to 2.2 Section 3.1 Page 3-1	Yes	

Adequacy Issue: Adequate Inadequate

DATA ADEQUACY WORKSHEET

Revision No. 1 Date May 2022

Technical Area: Transmission System Design
 Project Manager: Leonidas Payne

Project: Gem Energy Storage Center
 Docket: 21-AFC-02

Technical Staff: Laiping Ng
 Technical Senior: Mark Hesters

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (b) (2) (E)	<p>A completed System Impact Study or signed System Impact Study Agreement with the California Independent System Operator and proof of payment. When not connecting to the California Independent System Operator controlled grid, provide the executed System Impact Study agreement and proof of payment to the interconnecting utility.</p> <p>If the interconnection and operation of the proposed project will likely impact an transmission system that is not controlled by the interconnecting utility (or California Independent System Operator), provide evidence of a System Impact Study or agreement and proof of payment (when applicable) with/to the impacted transmission owner or provide evidence that there are no system impacts requiring mitigation.</p>	<p>Section 3.3 Pages 3-7 to 3-12</p> <p>Appendix 3A</p>	Yes	
Appendix B (i) (1) (A)	<p>Tables which identify laws, regulations, ordinances, standards, adopted local, regional, state, and federal land use plans, leases, and permits applicable to the proposed project, and a discussion of the applicability of, and conformance with each. The table or matrix shall explicitly reference pages in the application wherein conformance, with each law or standard during both construction and operation of the facility is discussed; and</p>	<p>Section 3.5 Pages 3-16 to 3-19</p>	Yes	

Adequacy Issue: Adequate Inadequate

DATA ADEQUACY WORKSHEET

Revision No. 1 Date May 2022

Technical Area: Transmission System Design
 Project Manager: Leonidas Payne

Project: Gem Energy Storage Center
 Docket: 21-AFC-02

Technical Staff: Laiping Ng
 Technical Senior: Mark Hesters

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (i) (1) (B)	Tables which identify each agency with jurisdiction to issue applicable permits, leases, and approvals or to enforce identified laws, regulations, standards, and adopted local, regional, state and federal land use plans, and agencies which would have permit approval or enforcement authority, but for the exclusive authority of the commission to certify sites and related facilities.	Section 3.5.7 Pages 3-18 to 3-19	Yes	
Appendix B (i) (2)	The name, title, phone number, address (required), and email address (if known), of an official who was contacted within each agency, and also provide the name of the official who will serve as a contact person for Commission staff.	N/A	N/A	
Appendix B (i) (3)	A schedule indicating when permits outside the authority of the commission will be obtained and the steps the applicant has taken or plans to take to obtain such permits.	N/A	N/A	Schedule is dictated by the CAISO Interconnection Process.

Adequacy Issue: Adequate Inadequate

DATA ADEQUACY WORKSHEET

Revision No. 1 Date May 2022

Technical Area: Visual Resources

Project: Gem Energy Storage Center

Technical Staff: Mark R. Hamblin

Project Manager: Leonidas Payne

Docket: 21-AFC-02

Technical Senior: Steve Kerr

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (1)	...provide a discussion of the existing site conditions, the expected direct, indirect and cumulative impacts due to the construction, operation and maintenance of the project, the measures proposed to mitigate adverse environmental impacts of the project, the effectiveness of the proposed measures, and any monitoring plans proposed to verify the effectiveness of the mitigation.	Page 5.13-5, Section 5.13.2.2. Pages 5.13-16-19, Section 5.13.3.4.1. Pages 5.13.21, Sections 5.13.3.5 and 5.13.4. Page 5.13-22, Section 5.13.5.	Yes	
Appendix B (g) (6) (A)	Descriptions of the existing visual setting of the vicinity of the proposed project site and the proposed routes for any project-related linear facilities. Include:	Page 5.13-4, Section 5.13.2.1.	Yes	
Appendix B (g) (6) (A) (i)	Topographic maps at a scale of 1:24,000 that depict directions from which the project would be seen, the view areas most sensitive to the potential visual impacts of the project, and the locations where photographs were taken for (g)(6)(C); and	Page 5.13-7, Figure 5.13-3	Yes	
Appendix B (g) (6) (A) (ii)	Description of the existing visual properties of the topography, vegetation, and any modifications to the landscape as a result of human activities, including existing water vapor plumes, above-ground electrical transmission lines, and nighttime lighting levels in the project viewshed.	Page 5.13-4, Section 5.13.2.1.	Yes	

Adequacy Issue: Adequate Inadequate

DATA ADEQUACY WORKSHEET

Revision No. 1 Date May 2022

Technical Area: **Visual Resources**

Project: Gem Energy Storage Center

Technical Staff: Mark R. Hamblin

Project Manager: Leonidas Payne

Docket: 21-AFC-02

Technical Senior: Steve Kerr

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (6) (B)	An assessment of the visual quality of those areas that would be affected by the proposed project. For projects proposed to be located within the coastal zone, the assessment should also describe how the proposed project would be sited to protect views to and along the ocean and scenic coastal areas, would minimize the alteration of natural landforms, would be visually compatible with the character of surrounding areas.	Pages 5.13-6-13-19, Section 5.13.3.4.1. Page 5.13-21, Section 5.13.3.5.	Yes	
Appendix B (g) (6) (C)	In consultation with Energy Commission staff, identify: i) any designated scenic roadways or scenic corridors and any visually sensitive areas that would be affected by the proposed project, including recreational and residential areas; and ii) the locations of the key observation points to represent the most critical viewing locations from which to conduct detailed analyses of the visual impacts of the proposed project. Indicate the approximate number of people using each of these sensitive areas and the estimated number of residences with views of the project. Also identify any major public roadways and trails of local importance that would be visually impacted by the project and indicate the types of travelers (e.g., local residents, recreationists, workers, commuters, etc.) and the approximate number of vehicles, bicyclists, and/or hikers per day.	Page 5.13.4, Section 5.13.2.1. Page 5.13-8-10, Section 5.13.3.1.3. Page 5.13-10-11, Section 5.13.3.1.4.	No consultation with staff otherwise Yes.	
Appendix B (g) (6) (D)	A table providing the dimensions (height, length, and width, or diameter) and, proposed color(s), materials, finishes, patterns, and other proposed design characteristics of each major component visible from off the project site, including any project-related electrical transmission line and/or offsite aboveground pipelines and metering stations.	Page 5.13-14-15, Section 5.13.3.3.1	Yes	

Adequacy Issue: Adequate Inadequate
 Technical Area: Visual Resources
 Project Manager: Leonidas Payne

DATA ADEQUACY WORKSHEET

Revision No. 1 Date May 2022
 Technical Staff: Mark R. Hamblin
 Technical Senior: Steve Kerr

Project: Gem Energy Storage Center
 Docket: 21-AFC-02

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (6) (E)	Provide the cooling tower and heat recovery steam generator (HRSG) exhaust design parameters that affect visible plume formation. For the cooling tower, data shall include heat rejection rate, exhaust temperature, exhaust mass flow rate, liquid to gas mass flow ratio, and, if the tower is plume-abated, moisture content (percent by weight) or plume-abated fogging curve(s). The parameters shall account for a range of ambient conditions (temperature and relative humidity) and proposed operating scenarios, such as duct firing and shutting down individual cells. For the heat recovery steam generator exhausts, data shall include moisture content (percent by weight), exhaust mass flow rate, and exhaust temperature. The parameters must correspond to full-load operating conditions at specified ambient conditions, and shall account for proposed operating scenarios, such as power augmentation (i.e., evaporative coolers, inlet foggers, or steam injection) and duct firing, or proposed HRSG visible plume abatement, such as the use of an economizer bypass. For simple-cycle projects, provide analogous data for the exhaust stack(s).	Page 5.13-16, Section 5.13.3.3.4. Appendix 5.13B.	Yes	

Adequacy Issue: Adequate Inadequate

DATA ADEQUACY WORKSHEET

Revision No. 1 Date May 2022

Technical Area: **Visual Resources**

Project: Gem Energy Storage Center

Technical Staff: Mark R. Hamblin

Project Manager: Leonidas Payne

Docket: 21-AFC-02

Technical Senior: Steve Kerr

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (6) (F)	Provide: i) full-page color photographic reproductions of the existing site, and ii) full-page color simulations of the proposed project at life-size scale when the picture is held 10 inches from the viewer's eyes, including any project-related electrical transmission lines, in the existing setting from each key observation point. If any landscaping is proposed to comply with zoning requirements or to mitigate visual impacts, include the landscaping in simulation(s) representing sensitive area views, depicting the landscaping five years after installation; and estimate the expected time until maturity is reached.	Appendix 5.13A Landscape Photographs and Simulations	Yes	
Appendix B (g) (6) (G)	An assessment of the visual impacts of the project, including light, glare, and any modeling of visible plumes. Include a description of the method and identify any computer model used to assess the impacts. Provide an estimate of the expected frequency and dimensions (height, length, and width) of the visible cooling tower and/or exhaust stack plumes. Provide the supporting assumptions, meteorological data, operating parameters, and calculations used.	Page 5.13-16, Sections 5.13.3.3.3 and 5.13.3.3.4. Appendix 5.13B. Page 5.13-19-20, Section 5.13.3.4.2. Page 5.13-21, Section 5.13.3.5.	Yes	
Appendix B (g) (6) (H)	If any landscaping is proposed to reduce the visual impacts of the project, provide a conceptual landscaping plan at a 1:40 scale (1"=40'). Include information on the type of plant species proposed, their size, quantity, and spacing at planting, expected heights at 5 years and maturity, and expected growth rates.	No landscaping proposed.	Yes	

Adequacy Issue: Adequate Inadequate

DATA ADEQUACY WORKSHEET

Revision No. 1 Date May 2022

Technical Area: Visual Resources

Project: Gem Energy Storage Center

Technical Staff: Mark R. Hamblin

Project Manager: Leonidas Payne

Docket: 21-AFC-02

Technical Senior: Steve Kerr

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (i) (1) (A)	Tables which identify laws, regulations, ordinances, standards, adopted local, regional, state, and federal land use plans, leases, and permits applicable to the proposed project, and a discussion of the applicability of, and conformance with each. The table or matrix shall explicitly reference pages in the application wherein conformance, with each law or standard during both construction and operation of the facility is discussed; and	Page 5.13-22-23, Section 5.13.6 Data Adequacy Response (TN #242776) page 21-22, section 5.13	No Yes	Table or matrix shall explicitly reference pages in the application wherein conformance, with each law or standard during both construction and operation of the facility is discussed.
Appendix B (i) (1) (B)	Tables which identify each agency with jurisdiction to issue applicable permits, leases, and approvals or to enforce identified laws, regulations, standards, and adopted local, regional, state and federal land use plans, and agencies which would have permit approval or enforcement authority, but for the exclusive authority of the commission to certify sites and related facilities.	Page 5.13-23, Section 5.13.7. Page 5.13-24, Section 5.13.8.	Yes	
Appendix B (i) (2)	The name, title, phone number, address (required), and email address (if known), of an official who was contacted within each agency, and also provide the name of the official who will serve as a contact person for Commission staff.	Page 5.13-23, Section 5.13.7.	Yes	
Appendix B (i) (3)	A schedule indicating when permits outside the authority of the commission will be obtained and the steps the applicant has taken or plans to take to obtain such permits.	Page 5.13-24, Section 5.13.8.	Yes	

Adequacy Issue: Adequate Inadequate

DATA ADEQUACY WORKSHEET

Revision No. 1 Date May 2022

Technical Area: Water Resources

Project: GEM Energy Storage Center

Technical Staff: Abdel-Karim Abulaban

Project Manager: Lon Payne

Docket: 21-AFC-02

Technical Senior: Shahab Khoshmashrab

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (1)	...provide a discussion of the existing site conditions, the expected direct, indirect and cumulative impacts due to the construction, operation and maintenance of the project, the measures proposed to mitigate adverse environmental impacts of the project, the effectiveness of the proposed measures, and any monitoring plans proposed to verify the effectiveness of the mitigation.	Sec. 2.1.15, P. 2-18; Sec. 5.15, pages 5.15-1 to 5.15-26 Appendix 2D	Yes	
Appendix B (g) (14) (A)	All the information required to apply for the following permits, if applicable, including:		Yes	
Appendix B (g) (14) (A) (i)	Waste Discharge Requirements; National Pollutant Discharge Elimination System Permit; and/or a Section 401 Certification or Waiver from the appropriate Regional Water Quality Control Board (RWQCB);	Sec. 5.15.5.2 P. 5.15-22 &-23	Yes	
Appendix B (g) (14) (A) (ii)	Construction and Industrial Waste Discharge and/or Industrial Pretreatment permits from wastewater treatment agencies;	N/A	N/A	
Appendix B (g) (14) (A) (iii)	Nationwide Permits and/or Section 404 Permits from the U.S. Army Corps of Engineers; and	N/A	N/A	
Appendix B (g) (14) (A) (iv)	Underground Injection Control Permit(s) from the U.S. Environmental Protection Agency, California Division of Oil and Gas, and RWQCB.	Sec. 5.15.5.1 P. 5.15-21	Yes	
Appendix B (g) (14) (B)	A detailed description of the hydrologic setting of the project. The information shall include a narrative discussion and on maps at a scale of 1:24,000 (or appropriate scale approved by staff), describing the chemical and physical characteristics of the following nearby water bodies that may be affected by the proposed project:	Sec. 5.15.1 P. 5.15-1 to -17	Yes	

Adequacy Issue: Adequate Inadequate
 Technical Area: Water Resources
 Project Manager: Lon Payne

DATA ADEQUACY WORKSHEET

Revision No. 1 Date May 2022
 Technical Staff: Abdel-Karim Abulaban
 Technical Senior: Shahab Khoshmashrab

Project: GEM Energy Storage Center
 Docket: 21-AFC-02

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (14) (B) (i)	Ground water bodies and related geologic structures;	Sec. 5.15.1.2 P. 5.15-2 to -5; Fig. 5.15-2	Yes	
Appendix B (g) (14) (B) (ii)	Surface water bodies;	Sec. 5.15.1.1 P. 5.15-2 Fig. 5.15-1	Yes	
Appendix B (g) (14) (B) (iii)	Water inundation zones, such as the 100-year flood plain and tsunami run-up zones;	Sec. 5.15.1.4 P. 5.15-9 Fig. 5.15-4	Yes	
Appendix B (g) (14) (B) (iv)	Flood control facilities (existing and proposed); and	Sec. 5.15.1.4, P. 5.15-7 Sec. 5.15.2.3, P. 5.15-18	Yes	
Appendix B (g) (14) (B) (v)	Groundwater wells within ½ mile if the project will include pumping.	Fig. 5.15-3, p. 5.15-5	Yes	
Appendix B (g) (14) (C)	A description of the water to be used and discharged by the project. This information shall include:		Yes	
Appendix B (g) (14) (C) (i)	Source(s) of the primary and back-up water supplies and the rationale for their selection;	Sec. 5.15.1.5 P. 5.15-8 to -14	Yes	
Appendix B (g) (14) (C) (ii)	The expected physical and chemical characteristics of the source and discharge water(s) including identification of both organic and inorganic constituents before and after any project-related treatment. For source waters with seasonal variation, provide seasonal ranges of the expected physical and chemical characteristics. Provide copies of background material used to create this description (e.g., laboratory analysis);	Sec. 5.15.1.5.3 P. 5.15-13 & -14; Sec. 5.15.1.6.2 P. 5.15-14 to -17;	Yes	
Appendix B (g) (14) (C) (iii)	Average and maximum daily and annual water demand and waste water discharge for both the construction and operation phases of the project;	Sec. 5.15.1.5 Pages 5.15-8 to -13	Yes	

Adequacy Issue: Adequate Inadequate
 Technical Area: Water Resources
 Project Manager: Lon Payne

DATA ADEQUACY WORKSHEET

Revision No. 1 Date May 2022
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 Technical Senior: Shahab Khoshmashrab

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 Docket: 21-AFC-02

SITING REGULATIONS	INFORMATION	AFC PAGE NUMBER AND SECTION NUMBER	ADEQUATE YES OR NO	INFORMATION REQUIRED TO MAKE AFC CONFORM WITH REGULATIONS
Appendix B (g) (14) (C) (iv)	A detailed description of all facilities to be used in water conveyance (from primary source to the power plant site), water treatment, and wastewater discharge. Include a water mass balance diagram;	Sec. 5.15.1.5 Pages 5.15-8 to -18; Appendix 2D	Yes	
Appendix B (g) (14) (C) (v)	For all water supplies intended for industrial uses to be provided from public or private water purveyors, a letter of intent or will-serve letter indicating that the purveyor is willing to serve the project, has adequate supplies available for the life of the project, and any conditions or restrictions under which water will be provided. In the event that a will-serve letter or letter of intent can not be provided, identify the most likely water purveyor and discuss the necessary assurances from the water purveyor to serve the project;	Sec. 5.15.1.5.1 Sec 5.15.1.5.2 Pages 5.15-8 & -9	Yes	
Appendix B (g) (14) (C) (vi)	For all water supplied which necessitates transfers and/or exchanges at any point, identify all parties and contracts/agreements involved, the primary source for the transfer and/or exchange water (e.g., surface water, groundwater), and provide the status of all appropriate agencies' approvals for the proposed use, environmental impact analysis on the specific transfers and/or exchanges required to obtain the proposed supplies, a copy of any agency regulations that govern the use of the water, and an explanation of how the project complies with the agency regulation(s);	N/A	N/A	
Appendix B (g) (14) (C) (vii)	Provide water mass balance and heat balance diagrams for both average and maximum flows that include all process and/or ancillary water supplies and wastewater streams. Highlight any water conservation measures on the diagram and the amount that they reduce water demand; and	Sec. 5.15.1.5 Pages 5.15-8 to -14 Appendix 2D	Yes	

Adequacy Issue: Adequate Inadequate
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Project: GEM Energy Storage Center
 Docket: 21-AFC-02

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Appendix B (g) (14) (C) (viii)	<p>For all projects which have a discharge, provide a copy of the will-serve letter, permit or contract with the public or private entity that will be accepting the wastewater and contact storm water from the project. The letter, permit or contract, if possible, shall identify the discharge volumes and the chemical or physical characteristics under which the wastewater and contact storm water will be accepted.</p> <p>In the event that a will-serve letter, permit, or contract cannot be provided, identify the most likely wastewater/storm water entity and discuss why the applicant was unable to secure the necessary assurances to serve the project's wastewater/storm water needs. Also, discuss the term of the wastewater service to the project, whether the wastewater entity has adequate permit capacity for the volume of wastewater from the project and has adequate permit levels for the chemical/physical characteristics of the project's wastewater and storm water for the life of the project, and any issues or conditions/restrictions the wastewater entity may impose on the project.</p>	Sec. 5.15.5.2.2 Pages 5.15-25 to -26	Yes	
Appendix B (g) (14) (D)	Identify all project elements associated with stormwater drainage, including a description of the following:		Yes	
Appendix B (g) (14) (D) (i)	Monthly and/or seasonal precipitation and stormwater runoff and drainage patterns for the proposed site and surrounding area that may be affected by the project's construction and operation;	Sec. 5.15.1.1, p. 5.15-2 Sec. 5.15.1.7, p. 5.15-17 Fig. 5.15-5 Sec. 5.15.2.3, p. 5.15-18 to -19	Yes	
Appendix B (g) (14) (D) (ii)	Drainage facilities and the design criteria used for the plant site and ancillary facilities, including but not limited to capacity of designed system, design storm, and estimated runoff;	Sec. 5.15.1.7, P. 5.15-17; Sec. 5.15.2.3, P. 5.15-18	Yes	

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Appendix B (g) (14) (D) (iii)	All assumptions and calculations used to calculate runoff and to estimate changes in flow rates between pre- and post construction; and	Appendix 5.15A	Yes	
Appendix B (g) (14) (D) (iv)	A copy of applicable regional and local requirements regulating the drainage systems, and a discussion of how the project's drainage design complies with these requirements.	Sec. 5.15.5.2, Pages 5.15-22 to -24; Table 5.15-5	Yes	
Appendix B (g) (14) (E)	An impacts analysis of the proposed project on water resources and a discussion of conformance with water-related LORS and policy. This discussion shall include:		Yes	
Appendix B (g) (14) (E) (i)	The effects of project demand on the water supply and other users of this source, including, but not limited to, water availability for other uses during construction or after the power plant begins operation, consistency of the water use with applicable RWQCB basin plans or other applicable resource management plans, and any changes in the physical or chemical conditions of existing water supplies as a result of water use by the power plant;	Sec. 5.15-2 Pages 5.15-17 to -19	Yes	
Appendix B (g) (14) (E) (ii)	If the project will pump groundwater, an estimation of aquifer drawdown based on a computer modeling study shall be conducted by a professional geologist and include the estimated drawdown on neighboring wells within 0.5 mile of the proposed well(s), any effects on the migration of groundwater contaminants, and the likelihood of any changes in existing physical or chemical conditions of groundwater resources shall be provided;	Sec. 5.15.1.2, P. 5.15-6; Sec. 5.15.1.5, p. 5.15-8 to -10 Sec. 5.15.2.1, p. 5.15-16 AttDA515-1 (TN 242794)	Yes No	No groundwater drawdown analysis due to project pumping was provided. Only qualitative statements that project pumping would not cause adverse effects. Please provide this analysis.

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Appendix B (g) (14) (iii)	The effects of construction activities and plant operation on water quality and to what extent these effects could be mitigated by best management practices;	Sec. 5.15.2, Pages 5.15-17 to -19	Yes	
Appendix B (g) (14) (iv)	If not using a zero liquid discharge project design for cooling and process waters, include the effects of the proposed wastewater disposal method on receiving waters, the feasibility of using pre-treatment techniques to reduce impacts, and beneficial uses of the receiving waters. Include an explanation why the zero liquid discharge process is “environmentally undesirable,” or “economically unsound;”	Sec. 5.15.2 Pages 5.15-17 to -19	Yes	
Appendix B (g) (14) (v)	If using fresh water, include a discussion of the cumulative impacts, alternative water supply sources and alternative cooling technologies considered as part of the project design. Include an explanation of why alternative water supplies and alternative cooling are “environmentally undesirable,” or “economically unsound;”	Sec. 5.15.2.1 P. 5.15-18	Yes	
Appendix B (g) (14) (vi)	The effects of the project on the 100-year flood plain, flooding potential of adjacent lands or water bodies, or other water inundation zones; and	Sec. 5.15.1.7, p. 5.15-16; Appendix 5.15A Sec. 5.15.2.3, p. 5.15-18	Yes	
Appendix B (g) (14) (vii)	All assumptions, evidence, references, and calculations used in the analysis to assess these effects.	Appendix 5.15A	Yes	

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Appendix B (i) (1) (A)	Tables which identify laws, regulations, ordinances, standards, adopted local, regional, state, and federal land use plans, leases, and permits applicable to the proposed project, and a discussion of the applicability of, and conformance with each. The table or matrix shall explicitly reference pages in the application wherein conformance, with each law or standard during both construction and operation of the facility is discussed; and	Table 5.15-5	Yes	
Appendix B (i) (1) (B)	Tables which identify each agency with jurisdiction to issue applicable permits, leases, and approvals or to enforce identified laws, regulations, standards, and adopted local, regional, state and federal land use plans, and agencies which would have permit approval or enforcement authority, but for the exclusive authority of the commission to certify sites and related facilities.	Table 5.15-6	Yes	
Appendix B (i) (2)	The name, title, phone number, address (required), and email address (if known), of an official who was contacted within each agency, and also provide the name of the official who will serve as a contact person for Commission staff.	Table 5.15-6	Yes	
Appendix B (i) (3)	A schedule indicating when permits outside the authority of the commission will be obtained and the steps the applicant has taken or plans to take to obtain such permits.	Table 5.15-6	Yes	