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Gem Energy Storage Center (21-AFC-02) Data Adequacy Supplemental No.1

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Submitted by:

GEM A-CAES LLC

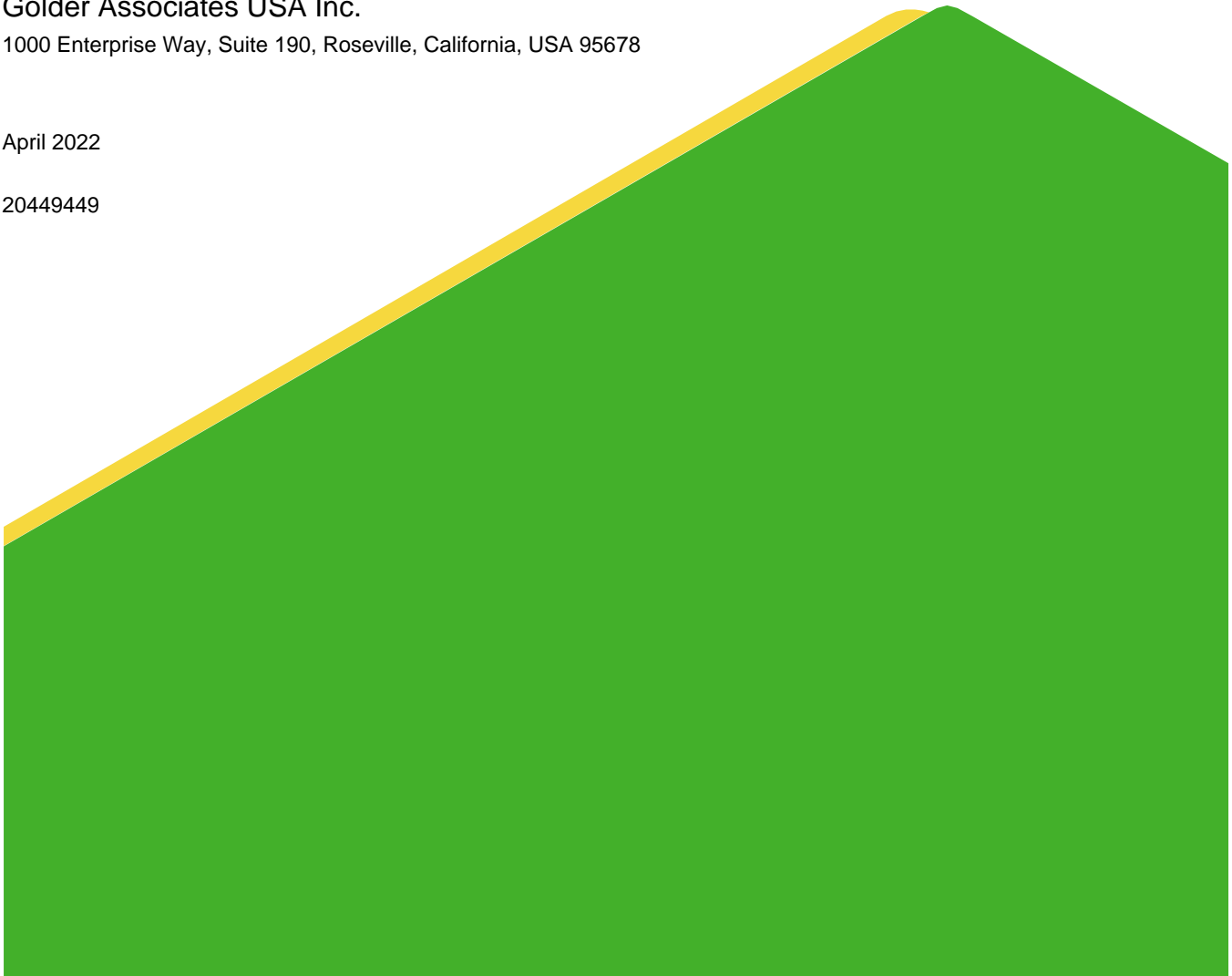
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List of Acronyms

AFC	Application for Certification
BFD	block flow diagram
CAPEX	capital expenditure
CEC	California Energy Commission
CCR	California Code of Regulations
GEM / GESC	Gem Energy Storage Center

Data Adequacy Supplement Introduction

This Data Adequacy Supplement #1 to the GEM A-CAES LLC (Gem) Application for Certification (AFC) for the Gem Energy Storage Center (Gem or GESC) (21-AFC-02) provides additional information in response to the California Energy Commission (CEC) Staff's December 30, 2021, data adequacy recommendation for all technical areas except Cultural Resources. A Data Adequacy Supplement #2 addressing Cultural Resources is expected to be filed in early to mid-May 2022. With the additional information contained in this supplement and the forthcoming second supplement, Staff should recommend that the AFC be found data adequate.

The format for this supplement follows the order of the AFC. To facilitate the review of this Supplement, we have identified the CEC Technical Area associated with each response. Only AFC sections for which CEC staff posed information requests or questions related to data adequacy are addressed in this supplement. In order to facilitate review, Siting Regulation text citations and Information Requested by CEC Staff were taken verbatim from the CEC Staff's data adequacy recommendation and are placed with quotation marks (" ") and indented in *italics formatted text*. Each CEC information request is preceded by a green, square-shaped bullet. The Applicant's data adequacy response is denoted with a boldface **Response:** header followed by the Applicant's response in standard format text. Where multiple information requests were posed for a given Siting Regulation citation, each individual response is preceded by a green, square-shaped bullet. References and other cited materials are included as an attachment at the end of the applicable AFC subsection. The attached material is identified by the prefix "DA" indicating an item submitted in response to a Staff Data Adequacy comment, a number referring to the applicable AFC chapter, and a sequential identifying number. For example, the first sequential attachment in response to a reliability comment requesting more information regarding operational history would be Attachment DA2.0-1, because the AFC section describing reliability, Project Description, is Section 2.0. The attached material is paginated separately from the document text. Each subsection references the data adequacy information request followed by a response to the information request.

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2.0 PROJECT DESCRIPTION

1) *Siting Regulation: Appendix B (h) (4) (A) – Technical Area: Efficiency – Energy Resources*

“Heat and mass balance diagrams for design conditions for each mode of operation.”

Information Requested by CEC Staff

- *“Source of power for the heat exchanger(s) is electric heater. How much power do the heat exchangers need in order to operate?”*

Response:

- Gem A-CAES LLC first wishes to clarify the nature of our heat exchangers as the question implies a power consumption for those pieces of equipment. They are not the same as the boilers/heaters which are commonly found in thermal power generation facilities. In Gem’s system, the low-pressure (LP), intermediate-pressure (IP) and high-pressure (HP) heat exchangers, as well as the air trim cooler, are all shell-and-tube heat exchangers which transfer heat from one process fluid to another. Any duties referenced in association with this equipment are thermal duties of heat transfer (i.e., energy lost from one stream and added to the other). None of the heat exchangers add heat or energy to the system in any way and no electricity or fuel is consumed.

The main process then has only one input and one output of power, which are the compressor motors and turbine generators, respectively. There are also auxiliary loads on top of this (such as fan coolers, pumps, building loads, instrumentation, and data acquisition systems, etc.). These power inputs and outputs already appear on the block flow diagrams (BFDs) which accompany the Heat and Mass Balance (HMB) tables in AFC Appendix 2C (see, TN#: 240768-4, Appendix 2C Heat and Mass Balance Diagrams, Table ‘Power Summary – (Dis)Charge System’, pdf p. 37.) The power is split unevenly between the low pressure, intermediate pressure, and high pressure (LP, IP, and HP) stages, with LP consuming/producing half of the total and IP/HP a quarter each. Additionally, power loss through gearing systems and transformers, as well as the relevant auxiliary loads are broken down in tables located on the left of the page.

There will be an electric heater in each of the hot water storage tanks and are only used on an infrequent basis. Their function is to keep the hot tank temperature stable by accounting for minor thermal losses through insulation to atmosphere. The load required is therefore a function of ambient temperature, specific tank design/insulation and operating cadence of the system (i.e., lengths of standby periods between runs, which are themselves dependent on power market conditions). This makes estimating the level of load difficult and hard to reflect on a steady-state heat and material balance. We estimate that the combined power draw for the three heaters will be in the range of 0 - 1,100 kilowatts (kW), with an expected average power draw of approximately 725 kW (total for all three combined).

2) Siting Regulation: Appendix B (b) (1) (C) – Technical Area: Project Overview

“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”

Information Requested by CEC Staff

- *“The California Independent System Operator’s grid interconnection queue webpage shows a 108-megawatt (MW) battery as part of the GESC 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 GESC 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).”*

Response:

- The Gem Energy Storage Center does not include a battery component. The referenced battery energy storage project is being sponsored by a different, affiliated entity and is a separate project. The two projects were included in the same CAISO application, as allowed for by the CAISO tariff, but they are not under common ownership or control and will be permitted separately by different lead agencies.

3) Siting Regulation: Appendix B (h) (3) (B) (v) – Technical Area: Reliability

“For technologies not previously installed and operated in California, the expected power plant maturation period.”

Information Requested by CEC Staff:

- *“Provide the make and model of the air compression drive trains and the air expansion turbine generators.”*
- *“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.”*

Response:

- Gem intends to conduct a competitive tendering process for the turbomachinery as part of the GESC. While specific equipment and equipment vendors have yet to be selected, a significant vendor pre-qualification exercise has been undertaken to identify Tier 1 vendors capable of supplying the equipment.

The specific equipment employed at the Gem will be determined during front-end engineering design. It is possible that detailed engineering conducted by the vendors in the firm quotation process will result in some alteration in the final turbomachinery selection. While vendors build equipment from standardized components, each turbomachine of this size is tailored to the specific application. Consequently, the style and casing size of the equipment may remain the same (corresponding to the first few characters in each model number), but the specific internals (such as the number of blades rows/stages) could change, resulting in a slightly altered model.

- The requested A-CAES historical operation summary is provided in **Attachment DA2.0-1**.

3.0 ELECTRICAL TRANSMISSION

4) Siting Regulation: Appendix B (b) (2) (C) – Technical Area: Transmission System Design

“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.”

Information Requested by CEC Staff:

- *“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.”*

Response:

- Southern California Edison (SCE) has indicated that the one-line diagram of the Whirlwind Substation is confidential Critical Energy Infrastructure Information and declined to provide the Applicant with the information. We are not aware of any potential changes being required within the Whirlwind Substation fence line to accommodate the interconnection for Gem. We note that SCE responded similarly to a similar request for the Stanton Energy Reliability Center (16-AFC-01) and the CEC accepted the Stanton Energy Reliability Center AFC as data adequate without this information.

5.0 ENVIRONMENTAL ANALYSIS

5.1 Air Quality

5) Siting Regulation Appendix B (g) (8) (A) – Technical Area: Air Quality

“The information necessary for the air pollution control district where the project is located to complete a Determination of Compliance.”

Information Requested by CEC Staff:

- *“Please provide a copy of the letter of completeness from the Eastern Kern Air Pollution Control District.”*

Response:

- A complete copy of the AFC including associated air quality and public health risk assessment modeling files was submitted to East Kern Air Pollution Control District (EKAPCD). EKAPCD requested a revision to the public health risk assessment and modeling due to the inadvertent omission of diesel particulate matter emissions from the operation of the emergency diesel engines. A revised public health risk assessment and associated modeling files were submitted to EKAPCD on March 14, 2022. The AFC was subsequently deemed complete by EKAPCD on March 21, 2022.

The revised public health risk assessment is included in **Attachment DA5.1-1** and replaces AFC Section 5.9 Public Health. Electronic files associated with the modeling have been docketed separately as Data Adequacy **Supplement DA5.1-2**. A copy of the EKAPCD letter of completeness is included in **Attachment DA5.1-3** (EKAPCD Completeness Determination).

5.2 Biological Resources

6) Siting Regulation: Appendix B (g) (1) – Technical Area: Biological Resources

“...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.”

Information Requested by CEC Staff:

- *“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.”*

Response:

- See **Attachment DA5.2-1** for the Biological Technical Report that includes original biological survey reports. Acreage impacts by habitat for the project site including linears are provided as **Attachment DA5.2-6**.
- Cumulative impacts result from spatial and temporal crowding of environmental disturbances. Most cumulative impacts from the installation in existing gen-tie lines routes have already occurred. The combined effects of concurrent construction projects could have a short-term less, than major cumulative impact on sensitive biological resources. However, the Applicant is unaware of any construction projects planned within the general vicinity of GESC that would coincide with the Project’s anticipated construction schedule. Additionally, the existing Willow Springs Specific Plan and Kern County zoning requirements will assist in preventing cumulative impacts to sensitive biological resources, once GESC is in operation. Therefore, cumulative impacts to biological resources identified within Section 5.2 are anticipated to be less than significant. Avoidance and minimization measures are described in Section 5.2.4 of the AFC and described in further detail below in Response No. 14.
- As discussed in Section 5.2.1.2.1 of the AFC, there are no federal jurisdictional waters identified within the Project area. Section 5.14 Waste Management and 5.15 Water Resources discuss mitigation measures for operational water requirements and the disposal of wastewater. Seasonally, GESC could generate a surplus of water due to rainwater collection and water produced during the compression sequence. Based on the Project’s design, it is anticipated that industrial wastewater, sanitary water, and stormwater will not be discharged offsite. In the event surplus water produced from the air compression process is required to be discharged, clean water will be released using one of the following strategies:

- Supplemental use for irrigation water in adjacent agriculture fields;
- Reinjecting into the aquifer; or
- Piped to potential end-users.

Therefore, impacts to state jurisdictional waters are anticipated to be less than significant.

7) Siting Regulation: Appendix B (g) (13) (A) – Technical Area: Biological Resources

“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.”

Information Requested by CEC Staff:

- *“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) 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.”*

Response:

- See **Attachment DA5.2-2** for an updated map that includes results of desert tortoise and burrowing owl surveys and the locations of all suitable burrows and their classification.
- Blackhawk’s 2021 survey did not identify the presence of the American badger and the Mohave ground squirrel within the Project’s study area. Based on lack of observations, the American badger and Mohave ground squirrel were not illustrated on GESC project maps. According to a review of CNDDDB in January 2022, the desert kit fox (*Vulpes macrotis arsipus*) is an unlisted wildlife subspecies. During Blackhawk’s 2021 survey, desert kit fox observations were noted during the burrowing owl (*Athene cunicularia*) and desert tortoise surveys. Observations made by Blackhawk’s survey team included the presence of burrows that could support the desert kit fox and scat that was attributed to the species. Based on the lack of protective status for the desert kit fox, the Project figures do not present desert kit fox survey data, nor are any additional analyses warranted. In addition, this Project is beyond the range of the San Joaquin kit fox (*Vulpes macrotis mutica*), a federally endangered and State-threatened kit fox subspecies, and there are no occurrences of San Joaquin kit fox within 10 miles of the Project. Since the Project site is beyond the range of the San Joaquin kit fox, and there are no occurrences of San Joaquin

kit fox within 10 miles of the Project, focused surveys should not be required for this subspecies, nor were they conducted.

- Refer to **Attachment DA5.2-7** for the updated Section 5.2 Biological resources which has a discussion on the Desert Renewable Energy Conservation Plan and the West Mojave Plan.

8) **Siting Regulation: Appendix B (g) (13) (A) (vi) – Technical Area: Biological Resources**

“Fish and wildlife species that have commercial and/or recreational value.”

Information Requested by CEC Staff:

- *“Please provide a section or subsection of fish and wildlife with recreational value.”*

Response:

- Following the suite of biological surveys conducted in 2021 for GESC it was determined that with the possible exception of hunting opportunities in some areas, there are little to no fish or wildlife species in the Project/Study Area that offer commercial and/or recreational value. The following provides additional details on the lack of recreational value for fish and wildlife:
 - There are no fish species present, and no commercial value was thought present for any of the observed wildlife species.
 - Recreational value for wildlife species within the proposed Project right-of way, and all its considered alternatives, may feasibly be anticipated for limited, primary seasonal birdwatching opportunities, but little else.

9) **Siting Regulation: Appendix B (g) (13) (B) (i) – Technical Area: Biological Resources**

“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.”

Information Requested by CEC Staff:

- *“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) 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.”*

Response:

- See **Attachment DA5.2-2** for an updated map that includes results of desert tortoise, burrowing owl and all suitable burrow type locations.

- Blackhawk’s 2021 survey did not identify the presence of the American badger and the Mohave ground squirrel within the Project’s study area. Based on lack of observations, the American badger and Mohave ground squirrel were not illustrated on GESC project maps. According to a review of CNDDDB in January 2022, the desert kit fox (*Vulpes macrotis arsipus*) is an unlisted wildlife subspecies. During Blackhawk’s 2021 survey, desert kit fox observations were noted during the burrowing owl (*Athene cunicularia*) and desert tortoise surveys. Observations made by Blackhawk’s survey team included the presence of burrows that could support the desert kit fox and scat that was attributed to the species. Based on the lack of protective status for the desert kit fox, the Project figures do not present desert kit fox survey data, nor are any additional analyses warranted.

10) **Siting Regulation: Appendix B (g) (13) (B) (iii) – Technical Area: Biological Resources**

“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.”

Information Requested by CEC Staff:

- *“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.”*

Response:

- Refer to **Attachment DA5.2-3** for the full Jurisdictional Delineation Report conducted by Blackhawk, which includes methods for determining Federal and State jurisdictional waters. In summary, CDFW jurisdiction extends from the lateral extents of the tops of the banks on the mapped features, while RWQCB jurisdiction was mapped to the lateral extents of the Ordinary High-Water Marks (OHWMs), which are equal to or smaller than the CDFW extents. Therefore, RWQCB is a smaller subset of the larger CDFW jurisdictional area for ephemeral drainages. Each drainage is depicted with RWQCB and CDFW jurisdiction.
- The boundary in Figure 5.2-1c showcases a 125-foot-wide corridor that includes the right-of-way of the proposed gen tie-lines. Refer to **Attachment DA 5.2-3** for the full Jurisdictional Delineation Report that discusses methods and buffers determined for the preliminary jurisdictional delineation.
- Discussion on mapped non-jurisdictional waters is provided in the Jurisdictional Delineation Report in **Attachment DA5.2-3**.

11) Siting Regulation: Appendix B (g) (13) (D) – Technical Area: Biological Resources

“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:”

Information Requested by CEC Staff:

- *“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.”*

Response:

- Refer to **Attachment DA5.2-4** for the resumes of all biologists who conducted field surveys.
- Refer to **Attachment DA5.2-5** for the field notes completed during field surveys completed by Blackhawk.
- Refer to **Attachment DA5.2-1** for the Biological Technical Report generated by Blackhawk for all protocols used for surveys.
- The Crotch’s bumble bee was a candidate for State listing status; however, according to the February 2021 decision, the species has been removed from consideration. Therefore, focused surveys were not performed and should not be required.

12) Siting Regulation: Appendix B (g) (13) (D) (i) – Technical Area: Biological Resources

“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;”

Information Requested by CEC Staff:

- *“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.”*

Response:

- The 2021 Blackhawk Biological Technical Report provided as **Attachment DA5.2-1** includes references for protocol level surveys.
- The Mohave ground squirrel was not observed during the 2021 Blackhawk biological surveys of the study area. The desert kit fox is an unlisted wildlife species and therefore no specific surveys were conducted. As discussed in request 11, the Crotch's bumble bee was a candidate for State listing status, however according to the February 2021 decision, it has been removed from consideration. Therefore, focused surveys were not performed and should not be required. Golden eagles were opportunistically surveyed for during the surveys in 2021. Blackhawk noted that Golden eagles were not observed during the 2021 survey; however, the species does have a moderate potential to occur as a wintering/foraging migratory bird. Blackhawk concluded that the Golden Eagle was presumed absent because while suitable foraging habitat occurs throughout the Survey Area, no suitable nesting habitat occurs within the Project site. The 2021 Blackhawk survey identified potentially suitable nesting habitat occurs east of and outside of the Survey Area. Blackhawk's analysis was compiled from the lack of golden eagle observations during the 2021 surveys, two wintering CNDDDB records (one from 1998 and one from 2010), and one pre-1970 nesting CNDDDB record within 10 miles of the Project.

13) Siting Regulation: Appendix B (g) (13) (F) (ii) – Technical Area: Biological Resources

“All off-site habitat mitigation and habitat improvement or compensation, and an identification of contacts for compensation habitat and management;”

Information Requested by CEC Staff:

- *“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.”*

Response:

- As noted in the 2021 Blackhawk Biological Technical Report, the desert tortoise, Mohave ground squirrel, and golden eagle were not observed within the study area. The Applicant will prepare a monitoring and mitigation plan based on the Project's selection of a final gen-tie route. Mitigation will be based on quantifiable impacts to suitable habitat based on the Project's selection of a final gen-tie line route.
- The appropriate agency contacts for GESC study area include the following agencies:
 - **California Department of Fish and Wildlife:** DFW Central Region (Region 4), Regional Manager: Julie Vance, Main Office: 1234 E. Shaw Avenue Fresno, CA 93710, Phone: (559) 243-4005 ext. 151, Email: reg4assistant@wildlife.ca.gov
 - **United States Fish and Wildlife Service:** San Joaquin Valley Division, Patricia Cole, Division Supervisor, Phone: (916) 414-6544

14) Siting Regulation: Appendix B (g) (13) (G) – Technical Area: Biological Resources

“A discussion of compliance and monitoring programs to ensure the effectiveness of impact avoidance and mitigation measures incorporated into the project.”

Information Requested by CEC Staff:

- *“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)”*

Response:

- As described in Section 5.2.4 of the AFC, the Applicant will prepare a Biological Resources Mitigation Implementation and Minimization Plan (BRMIMP) biological resources impact that will assist the project in avoiding and minimizing adverse effects on biological resources during construction and operations. The plan will be prepared prior to construction and in coordination with the applicable resource agencies and services. The BRMIMP will include the following:
 - A site-specific worker environmental awareness program (WEAP), intended to educate construction workers and operators on biological resources in the area and the measures that will be undertaken to avoid or minimize impacts to protected resources.
 - As part of the mitigation and monitoring plan, WEAP will be administered by a Biologist whose credentials will be reviewed and approved by CEC staff.
 - The WEAP will include an oral, video/PowerPoint, and/or written materials presentation that discusses the types of construction activities that may impact biological resources and the measures developed to avoid such impacts.
 - The WEAP will also include appropriate contact information for resource agency staff and procedures on how on-site staff will handle encounters with protected biological resources.
- The BRMIMP will outline how the Applicant will implement conservation and protection measures developed specifically for the project and the affected resources. The following details specific actions that will be presented in the mitigation and monitoring program:
 - The Applicant will provide construction monitoring by a qualified biologist to ensure compliance with the protection measures.
 - Conduct preconstruction and clearance surveys for avian species, as applicable.
 - Establish avoidance areas to ensure no encroachment on sensitive habitat.
 - A detailed relocation plan for Joshua trees in accordance with a pre-approved protocol.
 - Prepare standardized construction monitoring and compliance reports that analyze the effectiveness of the measures.
- The BRMIMP will include requirements for the restoration of temporarily disturbed areas with native species. Finally, the BRMIMP will include a plan for offsetting impacts to protected biological resources. The plan will include if deemed necessary mitigation requirements, agreed upon mitigation ratios, and summary of compensatory mitigation.

15) Siting Regulation: Appendix B (g) (13) (H) – Technical Area: Biological Resources

“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.”

Information Requested by CEC Staff:

- *“Please submit copies of correspondence with all appropriate agencies.”*

Response:

- A phone call between Kris Alberts (Blackhawk Principal Biologist) and CDFW’s Jaime Marquez (Jaime.marquez@wildlife.ca.gov, 559-417-9068) on 3-29-21 to discuss the methodologies utilized and overall approach to conduct the Swainson’s hawk surveys for this Project. Blackhawk’s 2021 Swainson’s hawk survey and reporting procedures followed the agreed-upon methodology, which followed those specified in: *Swainson’s Hawk Survey Protocols, Impact Avoidance, and Minimization Measures for Renewable Energy Projects in the Antelope Valley of Los Angeles and Kern Counties, California* (State of California Energy Commission and Department of Fish and Game June 2, 2010)
- CNDDDB forms were sent to CDFW for all observed special-status plant and wildlife species on the Project/Study Area by Blackhawk Biologist Katie Quint on 10-6-21.
- No agency correspondence was undertaken for the jurisdictional delineation survey/report, or any other focused survey/report conducted by Blackhawk for this project in 2021.

16) Siting Regulation: Appendix B (i) (1) (A) – Technical Area: Biological Resources

“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”

Information Requested by CEC Staff:

- *“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.”*

Response:

- Refer to **Attachment DA5.2-6** for an updated Section 5.2 Biological Resources that includes section numbers that conform to each LORS.

17) Siting Regulation: Appendix B (i) (1) (B) – Technical Area: Biological Resources

“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.”

Information Requested by CEC Staff:

- *“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.”*

Response:

- Refer to **Attachment DA5.2-6** for an updated Section 5.2 Biological Resources that includes the additional regulatory agency contacts.

18) Siting Regulation: Appendix B (i) (2) – Technical Area: Biological Resources

“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.”

Information Requested by CEC Staff:

- *“Please include in Table 5.2-9 details of specific agency contact who would serve as the contact person from each agency.”*

Response:

- Initial agency contacts are shown in AFC Table 5.2-9 in the updated Section 5.2 Biological Resources.

19) Siting Regulation: Appendix B (i) (3) – Technical Area: Biological Resources

“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.”

Information Requested by CEC Staff:

- *“Please supply a timetable for Section 7 coordination/consultation and any other permitting requirements by other agencies (e.g., CDFW and RWQCB).”*

Response:

- Initiation of Section 7 consultation will be based on discussions with the applicable federal agencies.

5.4 Geological Hazards

20) Siting Regulation: Appendix B (g) (17) (B) – Technical Area: Geological Hazards

“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.”

Information Requested by CEC Staff:

- *“Missing map and discussion of stratigraphy. There is some discussion of stratigraphy as it relates to palaeontology in Section 5.8, but it is insufficient for analysis of shafts and caverns.”*

Response:

- **Attachment DA5.4-1** has a revised fault map as well as a geologic map taken from Plate 10 of the 1963 Geological Survey Bulletin 1089-C titled Geology of the Willow Springs and Rosamond Quadrangles California (Dibblee, 1963). This map shows six geologic cross-sections, with section D-D' passing through the eastern portion of the Willow Springs Mountain approximately 1 mile east of the GESC. This cross section indicates the area surrounding Willow Springs Mountain consists of surficial quaternary period alluvial deposits on the order of up to 500-feet thick that are underlain by Jurassic or cretaceous period quartz monzonite bedrock with intrusions of the Gem Hill formation coincident with the extent of Willow Springs Mountain.

Quartz monzonite is the most widespread granitic rock within the Willow Springs and Rosamond quadrangles. The quartz monzonite is a medium- to coarse-grained holocrystalline granitic rock, which is present throughout the Rosamond Hills, Antelope Buttes, and in most of the Tehachapi Mountains. The mineralogy of the layer in these areas is expected to be fairly uniform. The Gem Hill Formation within the Rosamond Hills is a light-coloured sequence of lithic tuff, tuff breccia, tuffaceous sandstone, conglomerate, and other plutonic rocks of the Tropic group. It is predominantly composed of rhyolitic material. **Attachment DA5.4-1** identifies the Gem Hill formation in the vicinity of Willow Springs Mountain as predominantly including basaltic flows and porphyritic material.

The subsurface stratigraphy at the GESC site is expected to be similar to that indicated by geologic cross-section D-D' (Dibblee, 1963) around the base of Willow Springs Mountain. A site-specific geotechnical exploration will be performed at the proposed project location to confirm the site-specific subsurface conditions within the depths of the proposed shafts and caverns.

(Dibblee, 1963) United States Department of the Interior. 1963. Dibblee, *Geology of the Willow Springs and Rosamond Quadrangles California, Geological Survey Bulletin 1089-C*

21) Siting Regulation: Appendix B (i) (2) – Technical Area: Geological Hazards

“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.”

Information Requested by CEC Staff:

- *“Missing contact information of responsible individual in DSOD who will be overseeing design, construction, and safety of the jurisdictional dam creating the compensation reservoir.”*

Response:

- The following information includes contact information for the DSOD Branch Manager who will be involved in overseeing GESD:
 - Erik Malvick
Branch Manager, Design Engineering Branch
Division of Safety of Dams
(916)-565-7840
erik.malvick@water.ca.gov
2720 Gateway Oaks Drive, Suite 300
Sacramento, CA 95833

5.6 Land Use

22) Siting Regulation: Appendix B (g) (3) (A) (iv) – Technical Area: Land Use

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.”

Information Requested by CEC Staff:

- *“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).”*

Response:

- Refer to **Attachment DA5.6-1** that includes updates to AFC Section 5.6 Land Use Figures.

23) Siting Regulation: Appendix B (g) (3) (C) – Technical Area: Land Use

“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.”

Information Requested by CEC Staff:

- *“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.”*

Response:

- There are no current plans to merge the two project parcels, and no legal processes to merge a leasehold parcel with a parcel owned in fee simple. As described in Section 5.6.1.1 of the Application for Certification, the project site consists of two parcels, Assessor Parcel Number (“APN”) 315-081-09 and APN 315-081-01. Applicant is the lessee, not the owner, of APN 315-081-09 and the owner of APN 315-081-01. Parcels under separate ownership cannot be merged. (Govt. Code § 6645.11.) Further, merger is not required under the Kern County Code (§18.06.030.)

24) Siting Regulation: Appendix B (g) (3) (D) – Technical Area: Land Use

“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.”

Information Requested by CEC Staff:

- *“Please add the proposed transmission lines to Figure 5.6-5 (preferred route and alternate routes).”*

Response:

- Refer to **Attachment DA5.6-1** that includes updates to AFC Section 5.6 Land Use Figures.

25) Siting Regulation: Appendix B (i) (3) – Technical Area: Land Use

“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.”

Information Requested by CEC Staff:

- *“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.”*

Response:

- Applicant has conducted preliminary conversations with the County Planning Director regarding conformity determinations for the GESC and the County’s overall review of the project. Applicant has submitted an initial deposit of funds to the County to support the County’s review and participate in the CEC process. Since the CEC is the jurisdictional Lead Agency for the project, the County has indicated that any further information to support their review of the project will be submitted in response to the CEC’s request for review and comment regarding the AFC.

5.10 Socioeconomics

26) Siting Regulation: Appendix B (g) (7) (B) (vi) – Technical Area: Socioeconomics

“An estimate of applicable school impact fees;”

Information Requested by CEC Staff:

- *“Provide estimate of school impact fee”*

Response:

- The Southern Kern Unified School District Resolution of the Governing Board #21-22-07 dated December 8, 2021, regarding development fees established a \$0.66/sq.ft. emolument for new commercial or industrial development of covered or enclosed space within the district’s boundaries. The applicable Gem facilities will have a total square footage of 196,840. The applicable school impact fee for the Project is \$129,914.40.

27) Siting Regulation: Appendix B (g) (7) (B) (viii) – Technical Area: Socioeconomics

“An estimate of the expenditures for locally purchased materials for the construction and operation phases of the project;”

Information Requested by CEC Staff:

- *“Provide estimate of expenditures for locally purchased materials for the operation phases of the project”*

Response:

- Applicant estimates that expenditures for locally purchased materials during operation will be approximately 2.9 million dollars.

28) Siting Regulation: Appendix B (g) (7) (B) (x) – Technical Area: Socioeconomics

“An estimate of sales taxes generated during construction and separately during an operational year of the project;”

Information Requested by CEC Staff:

- *“Provide an estimate of the sales tax generated during an operational year of the project”*

Response:

- The Applicant anticipates that the operations phase of the GEM project would require approximately \$2.9 million in local services and goods, annually. The sales tax for the State of California is 4% and 3% for Kern County. Professional services are not subject to sales tax in California. As such, the project is expected to contribute up to \$203,000 in sales tax revenue, annually. Of the sales tax paid annually, up to \$87,000 will be distributed to Kern County.

29) Siting Regulation: Appendix B (g) (7) (B) (xi) – Technical Area: Socioeconomics

“An estimate of property taxes generated during an operational year of the project; and”

Information Requested by CEC Staff:

- *“Provide an estimate of property taxes generated during an operational year”*

Response:

- The Project will bring increased property tax revenue to Kern County. The current property tax rate is 1.22 percent for FY 2021. Assuming a Project total capital cost of \$997 million, the Project is estimated to generate approximately \$12 million in property taxes annually, assuming full application of the tax rate to the project. As such, the GESC project will result in a beneficial fiscal impact to the County.

5.13 Visual Resources

30) Siting Regulation: Appendix B (i) (1) (A) – Technical Area: Visual Resources

“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.”

Information Requested by CEC Staff:

- “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.”

Response:

- Refer to table DA5.13-1 below for a table summarizing the laws, ordinances, regulations, and standards (LORS) for AFC Section 5.13 Visual Resources.

Table DA5.13-1: LORS

LORS	Jurisdiction	Requirements	Agency	Section
California Environmental Quality Act	State	Requires an evaluation of scenic resources when considering project effects on the environment.	CEC	5.13.3.5
Kern County General Plan, Land Use, Open Space, and Conservation Element, Section 1.10.7	Local	Encourages the use of low-glare lighting to minimize nighttime effects.	Kern County Planning and Natural Resources Department	5.13.3.3.3 and 5.13.3.4.2
Kern County General Plan, Land Use, Open Space, and Conservation Element, Section 1.8	Local	Requires industrial uses to provide design features such as screen walls, landscaping, increased heights and/or setbacks, and lighting restrictions between the boundaries of adjacent residential land use to reduce	Kern County Planning and Natural Resources Department	5.13.3.3.1, 5.13.3.3.3, 5.13.3.5 and 5.13.5

LORS	Jurisdiction	Requirements	Agency	Section
		impacts on residences.		
Kern County Code of Ordinance, Chapter 19.81, Dark Skies Ordinance	Local	Provides requirements for outdoor lighting to avoid excessive illumination that may obscure the night sky and or may constitute a nuisance.	Kern County Planning and Natural Resources Department	5.13.3.3.3 and 5.13.3.4.2
Willow Springs Specific Plan	Local	Encourages the visual aesthetics of new industrial construction. Implementation measure for commercial development highlight the screening of outdoor storage of materials from public view.	Kern County Planning and Natural Resources Department	5.13.3.3.1, 5.13.3.3.2, 5.13.3.5 and 5.13.5

5.15 Water Resources

31) Siting Regulation: Appendix B (g) (14) (E) (ii) – Technical Area: Water Resources

“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;”

Information Requested by CEC Staff:

- *“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.”*

Response:

- A California registered professional geologist and certified hydrogeologist (Michael Bombard (PG 6470, CHG 646)) modelled the effects of the proposed groundwater extraction well on the Project site to estimate drawdown at nearby wells within 0.5 miles of and the potential for changes in existing conditions to groundwater resources. The results of the modelling, any effects on migration of groundwater contaminants and the likelihood of any changes to existing physical or chemical conditions in the groundwater are summarized in **Attachment DA5.15-1**. The results indicate that drawdown at one-half mile from the site will be 3.4 feet during the peak withdrawal period of 24 months depending on the well and aquifer characteristics. The capture zone evaluation, review of published contaminant sites and concentration data from nearby wells, indicate little risk of plume capture or chemical changes to existing plumes. The drawdown period is limited as the operation of the Site well will be for a limited timeframe during the construction and cavern fill phases of the project.

ATTACHMENT DA2.0-1

A-CAES Historical Operational Summary

ATTACHMENT DA5.1-1

Revised AFC Section 5.9 Public Health

ATTACHMENT DA5.1-2

**Air Modeling Files – submitted
electronically to CEC Staff**

ATTACHMENT DA5.1-3

EKAPCD Completeness Determination

ATTACHMENT DA5.2-1

**Blackhawk Biological Technical Report
(Confidential Figures Redacted per
CEC Staff Request)**

ATTACHMENT DA5.2-2

**Suitable Burrow Locations Figure
(Confidential filing per CEC Staff
Request)**

ATTACHMENT DA5.2-3

Jurisdictional Delineation Report

ATTACHMENT DA5.2-4

Resumes of Biologists

ATTACHMENT DA5.2-5

Biology Field Notes

ATTACHMENT DA5.2-6

Updated Section 5.2 Biological Resources

ATTACHMENT DA5.4-1

Geologic Figures

ATTACHMENT DA5.6-1

Updated AFC Section 5.6 Land Use Figures

ATTACHMENT DA5.15-1

Groundwater Drawdown Analysis



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